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**SUPER EFFICIENT REFRIGERATOR
PROGRAM (SERP) EVALUATION, VOLUME 1:
PROCESS EVALUATION**

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FOREWORD

This report is one of a two-volume set providing results from Pacific Northwest National Laboratory's evaluation of the Super Efficient Refrigerator Program. The reports were prepared for the U.S. Department of Energy.

The first volume presents the process evaluation of the Program. The second volume presents the results from the preliminary impact evaluation and the market transformation assessment.

Either report can be obtained by contacting James Brodrick, U.S. Department of Energy, at 202-586-5253. The reports can also be obtained by contacting the lead authors. Volume one is available from Linda Sandahl at 503-417-7554. Volume two is available from Allen Lee at 503--417-7556.

Summary

The Pacific Northwest National Laboratory (PNNL) conducted this study for the U.S. Department of Energy (DOE) as part of the Super Efficient Refrigerator Program (SERP) Evaluation. This report documents the SERP formation and implementation process, and identifies preliminary program administration and implementation issues. The findings are based primarily on interviews with those familiar with the program, such as utilities, appliance manufacturers, and SERP administrators. These interviews occurred primarily between March and April 1995, when SERP was in the early stages of program implementation. A forthcoming report will estimate the preliminary impacts of SERP within the industry and marketplace. Both studies were funded by DOE at the request of SERP Inc., which sought a third-party evaluation of its program.

SERP Formation

For years utilities had offered rebates and other forms of incentive programs to consumers to promote the purchase of energy-efficient refrigerator/freezers. While these programs were successful regionally, many utility planners believed they were not the most cost-effective way to expand the range of consumer choice in energy-efficient refrigerators. With the next round of federal refrigerator standards negotiations rapidly approaching, these entities believed the time was right to demonstrate that energy-efficient CFC-free refrigerators could be manufactured cost effectively. In 1991, the Environmental Protection Agency (EPA), the Natural Resources Defense Council (NRDC), the American Council for an Energy-Efficient Economy (ACEEE), the Washington State Energy Office, and utilities such as Pacific Gas & Electric, Sacramento Municipal Utility District, Long Island Lighting Company, and Southern California Edison began to discuss a nationwide market-based incentive program to accelerate the development of extremely energy-efficient, automatic defrost, chlorofluorocarbon (CFC)-free refrigerator/freezers.

The efforts of these individuals eventually led to the formation of the Super Efficient Refrigerator Program, Inc., (SERP). SERP is a non-profit corporation formed by 24 public and private utilities with a mission to advance the technology of super-efficient refrigerators and bring energy-efficient and environmentally friendly refrigerators to consumers years ahead of what would occur under normal market conditions. Such programs are often termed "market transformation" programs.

SERP member utilities committed about \$30 million to administer a competitive Request for Proposal (RFP) process and provide a "winner-take-all" cash incentive prize to the manufacturer who produced the winning SERP model. The RFP called for the development and distribution, between 1994 and 1997, of refrigerators that were CFC free and at least 25% more energy efficient than required by the 1993 federal standards. Additionally, SERP relied on the expertise of manufacturers to design and propose a super energy-efficient refrigerator with market appeal.

Utilities viewed the SERP process as desirable because funding the commercialization of one unit could potentially lead to the availability of several highly energy-efficient models. Additionally,

utilities found the national scope of SERP appealing because it allowed funds to be pooled to influence the national market for refrigerators. Utilities could not hope to individually influence a national market.

During the time when contracts with utilities were being finalized, SERP issued a draft RFP to refrigerator manufacturers, thus giving them a chance to comment on their perceptions of the program. After addressing these concerns, SERP issued the final RFP in July 1992.

Due to the competitive nature of the appliance industry, it was extremely important that SERP gain the trust of manufacturers. SERP pursued this trust through meetings with the industry and individual manufacturers, and strong assurances that company-specific information would remain strictly confidential. Because of confidentiality concerns, key information needed for this evaluation was not available from SERP.

The Winning Bid

In December 1992, SERP announced Frigidaire and Whirlpool as finalists and both were required to submit prototypes for testing. Ultimately, Whirlpool was selected as the winner. The winning bid involved a combination of refrigerator sizes (22, 25, and 27 cubic-foot). All sizes incorporated side-by-side and through-the-door water and ice features and exceed the 1993 federal standard for energy efficiency by 29.7% to 41%. Once all of the SERP refrigerators are operational in the market, the program is expected to deliver direct annual energy savings of about 100 gigawatt hours (GWh). Substantial indirect unquantified energy savings were also expected to result from an anticipated broad market impact of the units.

The first SERP models were shipped to dealers in February 1994. While most of the technology incorporated into the unit was "off the shelf," it achieved energy savings of 29.7% compared to similar models. The "second generation" SERP models that exceed Federal standards by 38%-41% were shipped to Whirlpool dealers in May 1995. In addition to the energy-saving features found in the first SERP units, these units also incorporate vacuum-panel insulation into the sidewalls.

Perspectives on Program Design

SERP planners had a number of program design challenges to face. For example, a "winner-take-all" approach was chosen over offering an incentive payment to all manufacturers who could produce a refrigerator/freezer that met minimum efficiency requirements. This approach was chosen to take full advantage of competitive forces in the industry, even though SERP planners knew it was not the approach favored by the refrigerator industry. SERP planners also debated whether to set restrictive refrigerator size and style requirements. A decision was made to allow the manufacturers considerable latitude in designing their proposed SERP refrigerator since they believed manufacturers were in the best position to determine the mix of product features, styles, and capacity to meet customer needs.

SERP utilities and manufacturers interviewed agreed with most of the SERP requirements specified in the RFP. The only RFP requirement that utilities disagreed on was the size requirement; half agreed with the requirement and half said that the allowable size range should not have included refrigerators as large as 26.7 cubic feet. Some utilities and manufacturers also reported that the side-by-side model should have been disallowed given its limited market penetration. However these utilities generally recognized the importance of leaving the size decisions up to the manufacturers since restricting the allowable bid size would hamper manufacturers' efforts to design a product that would best meet their customers' needs.

Manufacturers would have preferred a program that rewarded any manufacturer who achieved a certain level of energy efficiency instead of SERP's "winner-take-all" approach. Most SERP utilities reported that the "winner-take-all" approach was necessary to take maximum advantage of market forces.

Reasons for Joining SERP

Respondents interviewed for this evaluation reported that positive publicity, associated either with participating in the program (utilities) or potentially winning the competition (manufacturers), was one of the primary reasons for becoming involved in the program. Other reasons cited by utilities included the customer service benefits associated with the program, the support their regulators gave to the program, and the program's innovative/collaborative approach and market transformation potential. Generally, utilities believed that the program would help transform the market, lead to more stringent refrigerator standards, and accelerate the phasing out of CFCs in refrigerators without unduly impacting energy efficiency. Most manufacturers reported that SERP would have little or no impact in these areas.

Preliminary Implementation Issues

One of the objectives of this study was to identify any early implementation or administrative issues associated with SERP. Whirlpool reported that SERP unit sales were meeting its expectations; however, it identified administrative challenges that needed to be resolved, including a cash flow problem and the lack of accurate zip code data for SERP utility service territories. Whirlpool expressed frustration that the first payment for verified SERP unit sales was not received until April 1995, even though Whirlpool stated that it had submitted customer and sales data to SERP in compliance with the SERP tracking requirements. SERP reported that incentive payments to Whirlpool had not been made because adequate tracking information was not received from Whirlpool. According to SERP, the first invoice for SERP units was received on November 30, 1994, however it was not readable electronically by SERP. According to SERP, the first electronically readable invoice was not received until March 3, 1995. According to Whirlpool, however, the first invoice received on November 30, 1994, met all contractual obligations between SERP and Whirlpool.

The majority of SERP utilities reported frustration about not receiving any information on SERP unit purchases in their service territory. They expected this information much sooner. Many of these utilities reported that SERP management had not been responsive to their concerns about the lack of tracking information.

One of the goals of SERP was to make SERP units available to consumers at a price comparable to similar non-SERP units. A scientific investigation of pricing was beyond the scope of this study; however, both Whirlpool and the utilities were questioned about SERP pricing. Whirlpool reported that, based on its internal records, 90% of the SERP units are priced at a level similar to comparable, non-SERP models. SERP utilities were asked to tell us about their observations of SERP refrigerator prices in their service territory. The majority of utilities reported that they believed SERP units sold in their service territory were priced higher than comparable non-SERP units. However these utilities had not conducted any research to verify these views.

Update on Program Status

As mentioned previously, the majority of interviews conducted as part of this program evaluation were conducted during March and April 1995, and exploratory interviews with SERP planners were conducted during the summer of 1994 to identify key evaluation issues. Since that time, Whirlpool and SERP have made progress in resolving reporting issues and the utilities are receiving some information on SERP unit sales.

In December 1995, SERP reported that SERP unit sales were not in compliance with the sales schedule specified in the contract. According to SERP, SERP and Whirlpool were having discussions regarding how to increase sales of SERP units through increased advertising and other measures.

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Contents

Summary	iii
Acknowledgments	vii
1.0 Introduction	1.1
1.1 Background	1.2
1.2 Scope of Study	1.3
1.3 Report Format	1.4
2.0 The SERP Concept	2.1
2.1 Bid Pool Size	2.2
2.2 Appliance Category	2.2
2.3 Cost Effectiveness	2.3
2.4 Tracking	2.3
2.5 Broad Participation	2.3
2.6 Cross-Border Sales	2.3
2.7 Mass Production	2.3
2.8 Anti-Trust	2.4
3.0 SERP Program Features, Members, and Issues Surrounding Final Program Design	3.1
3.1 SERP Defined	3.1
3.2 Process for Recruiting Member Utilities	3.1
3.3 Coordination with the Appliance Industry	3.4
3.4 Program Objectives	3.5
3.5 Program Features	3.5
3.5.1 The "Winner-Take-All" Feature	3.5
3.5.2 Energy-Efficiency Requirement	3.6
3.5.3 Allowable Size	3.6
3.5.4 Mass Production Requirement	3.6
3.5.5 Tracking Requirement	3.6
3.5.6 Delivery Schedule	3.7
3.5.7 Payment Schedule	3.7
3.5.8 Cross Border Sales Account	3.7

3.5.9 Bid Timeline	3.8
3.5.10 Bid Scoring Formula	3.8
3.6 The Revised RFP	3.10
4.0 The Winning Bid	4.1
4.1 Marketing Plan	4.2
4.2 Tracking System	4.2
4.3 Dealer Training	4.3
4.4 Payment System	4.3
4.5 Size of Unit in Whirlpool's Bid	4.3
5.0 Perspectives from the Utility and Appliance Industries	5.1
5.1 Factors Considered in the Decision to Participate in SERP	5.2
5.1.1 Factors Considered by Utilities	5.2
5.1.2 Factors Considered by Manufacturers	5.5
5.2 Perspectives on Program Features and Requirements	5.8
5.2.1 "Winner Take All"	5.9
5.2.2 Bid Scoring Formula	5.10
5.2.3 Timeline for Submitting Bids	5.11
5.2.4 SERP Winner Selection Process	5.11
5.2.5 Allowable Refrigerator Size and Styles	5.12
5.2.6 SERP Mass Production Requirement	5.13
5.2.7 Energy-Efficiency Requirement	5.13
5.2.8 Tracking Requirement	5.13
5.2.9 Delivery Schedule	5.13
5.2.10 Payment Schedule	5.14
5.3 Concern Over Free Riders	5.14
5.4 Appropriateness of the SERP Approach	5.14
5.4.1 Refrigerator/Freezers as an Appliance Category Choice for SERP	5.15
5.4.2 Other Potential Appliance Candidates for a SERP-Like Program	5.16
5.5 Likelihood of Participating in a Similar Program in the Future	5.16
6.0 Preliminary Implementation Findings	6.1
6.1 Whirlpool's Perspective	6.1
6.2 SERP Utilities	6.1

6.3 Sales of SERP Units	6.2
6.4 Additional Rebates for SERP Units	6.3
7.0 Key Findings	7.1
7.1 Participation Decisions	7.1
7.1.1 Utilities	7.1
7.1.2 Manufacturers	7.2
7.2 Manufacturer Involvement with SERP RFP Design	7.2
7.3 Program Features and Requirements	7.3
7.4 Accomplishment of SERP Objectives	7.4
7.4.1 Introduction of Energy-Efficient Refrigerator Technology	7.5
7.4.2 Influencing the Stringency of the 1998 Refrigerator Standards	7.5
7.4.3 CFC Phase Out	7.5
7.4.4 Other Accomplishments	7.6
7.5 Appropriateness of SERP Approach	7.6
7.6 Likelihood of Participation in the Future	7.7
7.7 Administration and Implementation	7.7
7.8 SERP and Competition	7.8
7.9 SERP and Proprietary Information	7.9
8.0 References	8.1
Appendix A: Map of Participating Utilities	A-1
Appendix B: SERP Promotional Materials	B-1
Appendix C: SERP Label	C-1
Appendix D: ExacTrak™ Form	D-1
Appendix E: Dealer Training Materials	E-1

Figures

1.1 Timeline of SERP Process	1.5
------------------------------------	-----

Tables

3.1 Participating Utilities	3.3
3.2 Bid Proposal Timeline	3.9
3.3 Bid Scoring Factors	3.9
5.1 Importance Factors in Joining SERP	5.3
5.2 Utility and Manufacturer Attitudes on SERP Features and Requirements	5.8
5.3 Responses on Alternate Appliance Categories	5.17
6.1 Refrigerator Rebate Programs Offered by SERP Member Utilities	6.4

1.0 Introduction

The Pacific Northwest National Laboratory (PNNL) conducted a process evaluation of the Super Efficient Refrigerator Program (SERP) for the U.S. Department of Energy (DOE). The purposes of the evaluation were to 1) document the SERP formation and implementation process, 2) collect information on which aspects of the program utilities and manufacturers agreed and disagreed with, and 3) identify any preliminary problems in the administration and implementation of SERP. This report presents the results of interviews with key stakeholders in the program and analyzes which elements of the process were beneficial and which were problematic. Interviews with SERP planners were conducted to identify issues to address in this study. A forthcoming report will estimate the preliminary impacts of SERP within the industry and the marketplace.

Four groups were interviewed as part of the study:

- 1) **SERP member utilities.** Twelve of the 24 SERP member utilities were interviewed as part of this study. Utilities were selected according to geographic location and size (residential load) in order to reasonably represent the SERP membership.
- 2) **Utilities that did not join SERP.** The majority of information collected on this group was obtained from SERP planners who were involved in recruiting utilities. Information was available on 12 utilities. Only one utility that did not join SERP was familiar enough with the RFP to be interviewed.
- 3) **Manufacturers who submitted a bid.** Nine of the 14 manufacturers who submitted a bid to SERP were contacted as part of this study. All major refrigerator manufacturers were contacted, but five were unable to respond due to staff turnover or for other reasons.
- 4) **Manufacturers that did not submit a bid.** All major U.S. manufacturers submitted a bid to SERP. This group is comprised primarily of manufacturers who could not meet some minimum requirement of the SERP RFP.

Because of the proprietary nature of some of the information being retained by SERP, key pieces of data were unavailable to PNNL.^(a) For example, SERP declined to divulge the names of the manufacturers who submitted bids. Also, SERP declined to provide manufacturers' comments to SERP on the structure of the program due to agreements among the parties involved. Lastly, PNNL could not obtain tracking information on where the SERP units were being deployed because this information, when available, was only available to SERP members.

(a) The issues addressed by SERP are proprietary because of the competitiveness of the refrigerator/freezer market; manufacturers were concerned about technology and market secrets being leaked to competitors.

1.1 Background

Household refrigerators in the United States account for a large portion (about 14%) of total residential electricity use (E-SOURCE 1994, p. 14). The efficiency standards for refrigerators and other home appliances are set by the federal government under the National Appliance Energy Conservation Act (NAECA) of 1987 and are modified every five years. Although energy use per refrigerator unit has dramatically decreased over the last 15 years, there is still room for further improvements (EPA 1993).

Utility demand-side management (DSM) programs have attempted to increase market demand for energy-efficient products by offering consumer rebates. While these programs were successful regionally, many utility planners believed they were not the most cost-effective way to expand the range of consumer choice. Also, some appliance manufacturers are reluctant to improve the energy efficiency of their products when demand is spurred by rebates that may or may not be available in the future.

In 1991, a new type of "Golden Carrot" approach was envisioned, which allowed for a national utility collaborative program to transform the refrigerator market by introducing energy-efficient products through public/private partnership efforts. A number of events were occurring that could impact the refrigerator industry's move toward more energy-efficient levels. First, the phase out of chloro-fluorocarbons (CFC) mandated in the Montreal Protocol was incorporated into U.S. law with passage of the Clean Air Act Amendments of 1990. The Clean Air Act Amendments placed a ban on the production of CFCs in the U.S. as of January 1, 1996. This raised a concern that a conversion to CFC substitutes would hinder efficiency gains. Second, discussions were beginning regarding maximum energy consumption levels for the 1998 federal energy-efficiency standards. Third, although research had led to energy-efficient technologies, there was little incentive for manufacturers to promote their commercialization. Consumer interest and demand for energy-efficient refrigerators was low (L'Ecuier et al. 1992).

The culmination of all three factors in 1991 stirred discussion among a group of individuals representing utilities and environmental interests. These discussions eventually led to the formation of the Super Efficient Refrigerator Program, Inc. (SERP). SERP is a non-profit corporation formed by 24 public and private utilities with a mission to advance the technology of super efficient refrigerators and to bring energy-efficient and environmentally friendly refrigerators to consumers years ahead of when they would be available under normal market conditions. This was a unique approach compared to the traditional DSM programs sponsored by individual utilities.

Together, the SERP member utilities committed about \$30 million to administer a competitive Request for Proposals (RFP) process and to provide a "winner-take-all" contract for the manufacturer that produced the winning SERP model payable on a per-unit sold basis. The RFP called for the development and distribution of CFC-free refrigerators that were at least 25% more energy-efficient than was required by the 1993 federal standards (SERP 1992b).

SERP sought to achieve four main accomplishments:

- "to utilize existing market forces and provide incentives to manufacturers to design, develop, and distribute super efficient refrigerators during the years 1994 to 1997. This program will put super efficient refrigerators on the market years ahead of when they would be available in the absence of the program, helping to transform the refrigerator market to higher levels of energy-efficiency
- to ensure that any refrigerator distributed under the program meets high standards for energy-efficiency, pollution control, and consumer satisfaction
- to ensure that refrigerators developed under the program have adequate market appeal to ensure purchase by consumers
- to ensure accountability in the program, so that utility members can appropriately document relevant costs, kilowatt hours (kWh) of energy savings and efficiency. Such accountability will be an inherent part of the SERP, Inc., program (SERP 1992a)."

About 14 bids were submitted from refrigerator manufacturers; two were selected as finalists. Whirlpool Corporation was awarded the incentive pool of \$30 million based on their demonstration of the final product and their comprehensive tracking method, the ExacTrack System. Under the program, Whirlpool is to distribute 250,000 SERP refrigerators in 3.5 years. Once all of the SERP refrigerators are operational in the market, the program is expected to deliver direct annual energy savings of about 100 GWh. Substantial, but unquantified additional energy savings were expected to result from an anticipated broad market impact.

1.2 Scope of Study

Figure 1.1 shows a timeline of the SERP process, from the initial formation of SERP to the end of the program. This report will follow the timeline and describe the chronology of key events. Exploratory interviews with those involved in the development and implementation of SERP were conducted to identify issues to address in the study.^(a) Information presented in this study was obtained through interviews with SERP member utilities, nonmember utilities, and major refrigerator manufacturers. Although slightly different questionnaires were designed to target the different groups, each focused on the following issues:

- participation decisions

(a) Interviews were conducted with Liz Klumpp of the Washington State Energy Office, John Feist of SERP, Debra Byers and Michael Newsham of Bonneville Power Administration, Ray Farhang of Southern California Edison, Michael L'Ecuyer and Harvey Sachs of EPA, Steve Nadel of the American Council for an Energy Efficient Economy, and Robert Holding of the Association of Home Appliance Manufacturers.

- SERP design involvement
- SERP design
- SERP selection/implementation
- lessons learned
- program options
- SERP impacts.

1.3 Report Format

The report is organized as follows. Section 2 describes the formation of SERP, including the initial concept, the key issues, and alternatives explored. Section 3 describes the SERP program features, objectives, members, and the RFP. Section 4 discusses the winning bid and its components. Section 5 presents results from the survey findings. Preliminary findings on SERP administration and implementation are presented in Section 6.

Figure 1.1. Timeline of SERP Process

2.0 The SERP Concept

In the late 1980s, a number of factors combined to create a climate for new ideas to promote energy efficiency in refrigerators. First, many utilities were evaluating their DSM programs for refrigerators to identify cost-effective ways to achieve a greater level of energy savings. Although traditional DSM rebate programs were successful in many areas, utilities believed that there might be more cost-effective ways to achieve greater energy savings. Second, in order to comply with the Montreal Protocol, the refrigerator industry needed to convert to CFC-free refrigerant and insulation blowing compounds. Some in the refrigerator industry argued that these regulations would prevent the development of more energy-efficient refrigerators because CFC alternatives were less energy efficient. Third, the period for analyzing and establishing the U.S. Department of Energy's 1998 efficiency standards was fast approaching. Fourth, consumers did not demand a high level of energy efficiency in new refrigerators, so manufacturers had little incentive to improve energy performance beyond the 1993 federal standards.

This environment led to the realization by several organizations, including utilities, state energy offices, and the EPA, that there was a significant opportunity for a program to promote the introduction of an energy-efficient, CFC-free refrigerator. In 1990, these organizations met to discuss how such a program might be formulated. The group agreed that the best way to spur the development of advanced residential refrigerators was to move away from individual utility rebate programs in favor of providing funds directly to the manufacturer, allowing for the large-scale production of a more efficient model. This approach was designed to draw energy-efficient technology out of the developmental stages by buying down a portion of the manufacturer's costs. By doing so, advanced technology would be introduced into the market sooner than would occur under normal market conditions.

In addition, the group recognized that offering financial incentives directly to refrigerator manufacturers would have a larger impact on the retail price of refrigerators than a program offering rebates to consumers. Studies of utility DSM programs have shown that payments to manufacturers for energy-efficient upgrades are likely to have more financial leverage than incentives to buyers. This is because efficiency upgrades that the manufacturer a given amount could be priced considerably higher to the consumer after the manufacturer and dealer add their markups. Consequently, the utility offering an incentive for energy efficiency could probably get the same effect at a lower cost by giving the incentive to the manufacturer instead of to the consumer.

The Super Efficient Refrigerator Program was formed in 1991 by certain utility entities as a "nonprofit mutual benefit corporation to design and implement a program to offer an incentive to a manufacturer of refrigerators that makes available to the market commercial models of refrigerators meeting energy efficiency and environmental criteria adopted by SERP" (SERP 1992c). SERP involved a competition among refrigerator manufacturers to produce the most energy-efficient, CFC-free refrigerator at a price comparable to similar units. The manufacturer would also have to

demonstrate the ability to track the distribution of these refrigerators; the winner would receive an incentive pool of about \$30 million payable on a per-unit sold basis.

SERP recruited utilities to obtain funding for the award and subsequently released an RFP to manufacturers. SERP members believed that a "winner-take-all" structure was superior to other alternatives, such as an award to all manufacturers that achieved a certain level of efficiency. This single winner approach would optimize the impact of market forces (i.e., competition) and ensure that manufacturers would attempt to develop the best product possible, rather than settling for a certain efficiency level. Additionally, SERP program designers believed that this structure would help transform the market; after one manufacturer produced a more efficient model, other manufacturers would follow to protect their market share, thus allowing the program to have a lasting effect after the incentive money was spent. SERP was one of the first large-scale "market transformation" programs.

When SERP members first began to formulate the program, they realized that multiple issues needed to be resolved to ensure maximum participation on the part of utilities, manufacturers and consumers. These issues, and how they were addressed by SERP, are explained below.

2.1 Bid Pool Size

SERP planners determined that the bid pool would need to be about \$30 million.^(a) Significant interest needed to be generated within the utility community to ensure that there was an incentive pool large enough to entice manufacturers to offer advanced designs in their bids and significant manufacturer interest was needed to ensure that enough competition existed to drive the program.

SERP determined that the amount of prize money needed to spur competition in the refrigerator industry had to be significant enough to lead to a 5% penetration of the total refrigerator market in each service territory of participating utilities over the duration of the program (Feist et al. 1994). But most importantly, both manufacturers and utilities wanted to be confident that consumers would recognize the value of the advanced units, so it was imperative that the units be priced competitively with similarly sized refrigerators with comparable features.

2.2 Appliance Category

At the outset, SERP member utilities debated whether refrigerators were the best appliance category to be promoted by the bid pool. Some agreed that because refrigerators maintain a relatively constant load, as opposed to say, air conditioners, improving the efficiency of refrigerators has only a marginal effect on load shifting. Since utilities often formulate their incentive programs to affect

(a) This estimate was based in part on an estimate by the U.S. Environmental Protection Agency that it would take approximately \$50 to 60 million to retool a manufacturing production line. Personal communication with Steve Nadel, Amercian Council for an Energy-Efficient Economy, 12 March 1996.

overall load profile, spending a lot on a refrigerator program might preclude a utility from providing incentives for technologies that have a greater effect on peak loads.

Refrigerators were chosen for two primary reasons. First, given the large sales volume of refrigerators and their overall share of residential energy consumption, the participants in the program determined that focusing on refrigerators would lead to the greatest energy savings for the least cost. SERP participants recognized that public utility commissions (PUCs) are more interested in energy savings than load shaping, so choosing refrigerators would increase PUC interest and support in SERP. Second, SERP designers believed that demonstrating the cost-effective development of an energy-efficient, CFC-free refrigerator would indirectly lead to a stricter standard in 1998.

2.3 Cost Effectiveness

SERP needed to convince utilities that the program offered a sufficient payback on their investment. To do this, SERP established cost/benefit parameters that manufacturers needed to achieve in order to receive the entire incentive fund; to receive the total amount, manufacturers needed to ensure that the amount of the incentive used to reduce the cost of the unit did not exceed \$0.375 per first-year kWh savings (SERP 1992b).

2.4 Tracking

Utilities wanted an effective tracking system to be established so that they, and their respective regulatory agencies, could verify that the energy-efficient SERP units were installed in their service territories. SERP included strict tracking criteria in the RFP to help utilities verify the number of SERP units in their territories.

2.5 Broad Participation

Broad utility participation was key to SERP's innovative collaborative program approach. Because many utility partners had different avoided costs for generation and limited resources to devote to the program, SERP created two "tiers" for participation - utilities could opt to participate either fully or partially, depending on their resources. This decision was left to the individual utility.

2.6 Cross-Border Sales

Utilities were worried that units sold at retail stores in their service territories might actually end up in a household serviced by another utility. To address this problem, SERP devised a procedure to allocate funding to utilities that suffered from "cross-border" sales. This issue is explained in Section 3.5.7.

2.7 Mass Production

Another significant issue was whether or not the winning manufacturer would be able to mass produce the unit described in the bid. To address this issue, SERP included a number of criteria in the RFP relating to the manufacturer's production and distribution capabilities. After the proposals were received, the two finalists were asked to construct and submit prototypes for evaluation.

2.8 Anti-Trust

Another issue SERP was confronted with was a possible legal challenge. First, utilities participating in the program could conceivably be viewed as competitors who should not be pursuing collaborative types of programs. Second, it could appear that SERP was attempting to influence the retail price of the SERP refrigerator, another violation of antitrust law. Because of this, there was a concern that either the Federal Government or a private party would file an anti-trust complaint. SERP overcame this obstacle by obtaining a Business Review Clearance from the Antitrust Division of the U.S. Department of Justice. This comforted many interested parties, and the program was able to proceed (SERP 1992a).

3.0 SERP Program Features, Members, and Issues Surrounding Final Program Design

This section describes the SERP program including utility members, coordination with the appliance industry, the RFP process, and program requirements and objectives.

3.1 SERP Defined

SERP, Inc., was incorporated as a California nonprofit mutual benefit corporation in the fall of 1991 to manage the overall SERP program for the member utilities. The SERP Board of Trustees is comprised of executives from major utilities. Although utilities are the sole funders of SERP, Inc., the program designers believed establishing an independent corporation would be superior to designating a utility to manage the program for a number of reasons. First, none of the utilities participating in the program was willing to commit the resources to manage the entire program. Second, an independent organization would allow utilities to distinguish other DSM programs from SERP (Feist et al. 1994). Third, an independent corporation offered limited liability to the utilities. Fourth, incorporation would allow decisions to be made quickly by a central organization which would govern the program. Fifth, incorporation allowed SERP to receive tax-exempt status. Sixth, funding an independent corporation also allowed utilities to be free from dealing with the day-to-day administrative tasks associated with the program. Twenty-four utilities sponsored the program and provided a \$30 million pool of incentive money.

3.2 Process for Recruiting Member Utilities

SERP members believed that \$30 million was a realistic dollar target to guide SERP recruiting efforts and attract serious bids from manufacturers.^(a) This amount was derived through discussion among SERP members and other parties. SERP organizers recognized that manufacturers were more likely to participate and develop the most efficient refrigerator possible with a greater pool of money. A larger pool would increase the overall cost-effectiveness of the program, due to economies of scale, since the larger the bid pool, the more likely manufacturers would be to bid a larger number of refrigerators.

Early member utilities included Southern California Edison (SCE) and Pacific Gas & Electric (PG&E). These two companies were anchor utilities, contributing \$13 million between them. After these two committed to SERP, the program planners felt more confident that their \$30 million goal was attainable.^(b)

(a) Interviews with SERP members and program designers.

(b) Interview with John Feist, SERP, Inc.

In order to raise the \$30 million incentive money, SERP organizers started recruiting utilities soon after incorporation in September 1991. A full-scale marketing effort was designed to convince utilities of the merits of the program. Marketing teams comprised of SERP founders were developed to target utilities in different regions of the country. Utilities that decided to participate entered into a contract with SERP.

In many states, the utility regulatory commission was contacted to gain support for the program, and an endorsement was obtained from the National Association of Regulatory Utility Commissioners (NARUC). As a result, the Wisconsin Public Service Commission strongly encouraged its utilities to participate in the program. To support the recruiting efforts, the EPA developed a spreadsheet to show the cost effectiveness and savings to the utilities. This spreadsheet was used as a marketing tool to recruit utilities.

Utilities had the option of full participation (Group A), or limited participation (Group B), depending on the amount of DSM resources they had to devote to the program and the regulatory structure in their state. Based on an analysis using the EPA spreadsheet, utilities in group A could afford to commit at least \$175.50 for each unit, assuming energy savings of 300 kWh/year. Using the same analysis, group B utilities could afford to commit \$130.63 per unit that saved 300 kWh/year (based on the \$0.375 incentive per first-year kilowatt hour savings mentioned earlier). Group B would participate only if the winning manufacturer bid down to its threshold level (SERP 1992a).

Table 3.1 lists the current participating utilities by state. SERP-member utilities serve 21% of U.S. households. Although SERP suggested dollar amounts of commitment, individual utilities ultimately made their own decisions. SERP created a "projected utility payment timeline" for utilities to follow. Each utility was given the choice to contribute their incentive money up front or follow a periodic payment schedule. The payment plan started in June of 1994, with the last payment to occur in January of 1997. A map of the participating utilities can be found in Appendix A.

Utilities were required to contribute a minimum annual payment of \$5,000 as SERP membership dues, which allowed the member one vote on the election of SERP Board of Directors and other voting issues. Additional votes were allocated in proportion to the amount contributed. The Utility's funding commitment was applied as follows: 85.474% was applied to a Trust Account to be used for the manufacturer's incentive, 10.256% was used for administrative expenses and the remaining 4.27% went into a Cross-Border Trust Account (for more on this issue, see Section 3.5.7). SERP has the sole authority to access these accounts. The winning manufacturer would receive incremental portions of the incentive once specific obligations were met.

Table 3.1. Participating Utilities

State	Utilities
Arizona	Arizona Public Service Company
California	Los Angeles Department of Water and Power Northern California Power Agency ^(a) Pacific Gas & Electric Sacramento Municipal Utility District Southern California Edison
Idaho	Bonneville Power Administration
Maine	Central Maine Power
Maryland	Baltimore Gas & Electric
Massachusetts	Commonwealth Electric Company & Cambridge Electric Light New England Electric Service Co. Western Massachusetts Electric Company
Minnesota	Northern States Power Company
Montana	Bonneville Power Administration
New Jersey	Atlantic City Electric Company Jersey Central Power Public Service Electric & Gas Company
New York	Long Island Lighting Company
Oregon	Pacific Power & Light Bonneville Power Administration
Washington	Bonneville Power Administration
Wisconsin	Madison Gas & Electric Company Northern States Power Company Superior Water, Light, and Power Company Wisconsin Electric Power Company Wisconsin Power & Light Company Wisconsin Public Service Corporation
(a) Six of NCPA's 14 member utilities participated in SERP.	

3.3 Coordination with the Appliance Industry

To ensure that manufacturers' concerns were addressed, SERP sent individual manufacturers a draft RFP to give them a chance to comment on the program.^(a) Additionally, SERP coordinated with the Association of Home Appliance Manufacturers (AHAM) in an attempt to gain industry input and support regarding the design and implementation of SERP. In response, AHAM expressed its support for a number of the SERP objectives and identified several important concerns.

First, the industry supported the SERP approach of a national market solution as opposed to smaller regional or state programs. AHAM saw a need for government to help sort out the priorities of CFC replacement and efficiency improvement that would be accomplished with SERP.

Second, manufacturers were concerned with reliability and cost considerations because SERP might require them to introduce a refrigerator into the market prematurely. Because their reputations were at stake, manufacturers did not want to manufacture and distribute an unreliable product.

Third, the manufacturers' priority was to focus on the turnover of existing appliances in households. AHAM advocated the inclusion of an early retirement program in the "winner-take-all" approach, where consumers would be paid to retire their old, inefficient models and encouraged to replace them with the SERP unit. The SERP approach was viewed unfavorably in this respect by manufacturers since it did not offer an "early retirement" aspect.^(b)

Fourth, AHAM was opposed to a "winner-take-all" strategy, because not all of their members would benefit from the program. One idea that was closely scrutinized by SERP was to award incentive monies to all manufacturers whose units achieved a certain level of efficiency. Manufacturers liked this idea because it ensured at least some benefit from the program and minimized the risk of participation in the competition. SERP, however, believed this type of program would not utilize market forces to the greatest extent possible because multiple winners would reduce the possibility that a manufacturer would devote substantial resources to developing an advanced unit in an attempt to beat the competition.

A fifth major concern was tracking the distribution of the winning refrigerator according to guidelines stated in the RFP. AHAM stated that the most difficult obstacle for the manufacturers would be controlling which markets the refrigerator entered. Once the unit is shipped to a dealer it is hard for manufacturers to track refrigerator sales. Price controls were another issue, since manufacturers could not control prices at the retail level.

(a) Individual manufacturers expressed their views of the program. However, PNL was not allowed access to specific comments on file with SERP; SERP was, however, able to provide some general concerns expressed by manufacturers.

(b) Personal interviews.

3.4 Program Objectives

The primary objective of SERP was to encourage the production of an automatic defrost, CFC-free refrigerator that would be at least 25% more efficient than the 1993 federal standard. This level was chosen because it was high enough to lead to the production of a substantially more efficient unit, yet was low enough to encourage manufacturer participation. SERP believed that if one major manufacturer developed a significantly more efficient unit sooner due to the incentive, competitors would follow in order to protect their market share, thus accelerating the **introduction of energy-efficient refrigerator technology** into the marketplace (L'Ecuyer et al. 1992).

Another objective of the program was to have manufacturers produce this efficient unit **without ozone-depleting CFCs**. With passage of the Clean Air Act Amendments of 1990, production of CFCs in the United States was required to cease as of January 1, 1996. There was a general consensus in the industry that the elimination of CFCs would make efficiency improvements in refrigerators more difficult to achieve. SERP wanted a manufacturer to demonstrate that this was not necessarily the case.

SERP also identified another role this market transformation program could play, namely, indirectly **raising the 1998 federal efficiency standards for refrigerators**. There was a general consensus in the refrigerator industry that the 1998 standards would require only a modest increase in energy efficiency due to the CFC phase-out. Thus, encouraging a manufacturer to produce a cost-effective, more efficient unit would demonstrate that achieving higher standards was technically and economically feasible.

3.5 Program Features

Only one manufacturer would ultimately win the "winner-take-all" SERP contract. The RFP required proposed units to meet three technical requirements: 1) a minimum energy-efficiency level; 2) a minimum and maximum internal volume for the unit(s); and 3) no use of CFCs. In addition, proposals would be evaluated on the basis of the corporate reliability of the proposer, the strength of the proposer's sales tracking system, the strength of the marketing plan, and the cost effectiveness of the bid (i.e., the ability to deliver the number of units proposed, the overall efficiency of the unit, and the overall cost per unit bid).

3.5.1 The "Winner-Take-All" Feature

As mentioned earlier, SERP believed that awarding incentives to only one winner would allow competition in the marketplace to be used to the fullest extent. Some, however, saw reason for concern in linking the future success of the program to one manufacturer. Although most manufacturers were opposed to the "winner-take-all" approach for a number of reasons, many proposals were received, indicating the desire of manufacturers to participate in the program.

3.5.2 Energy-Efficiency Requirement

The RFP stated that "each size and model proposed must achieve the DOE Trial Level 5 Standards or use no more than 75% of the kWh/year allowed by the January 1993 NAECA standards for the model type and size, whichever produces the most savings" (SERP 1992b). The SERP member utilities believed this level of efficiency was feasible but the industry needed an incentive to produce a refrigerator with the required technology.

3.5.3 Allowable Size

The allowable size range for the interior capacity of the winning refrigerator was between 14.5 and 26.7 cubic feet. The draft RFP that had gone to the manufacturers for comment had listed a capacity range of 14.5 to 24.4 cubic feet; however, this size range was debated and modified several times before settling on the 14.5 to 26.7 cubic feet range. In an effort to maximize per unit energy savings, SERP adopted a bid scoring formula that awarded a large fraction of bid score points on the basis of per unit energy savings. This had the effect of biasing the competition toward large units, which are inherently easier to achieve large energy savings in. SERP also assessed what the most popular refrigerator sizes were in terms of sales, which contributed to SERP's decision on an acceptable size range. A major argument for allowing a broader size range was that manufacturers should be allowed the freedom to design a unit that meets their customers' size needs. Another argument in favor of the broad size range was that the technology in the winning refrigerator would eventually trickle over to all refrigerator sizes and models.^(a) SERP did not specify any style requirements.

3.5.4 Mass Production Requirement

The RFP required that the winning manufacturer identify the number of SERP refrigerator units to be produced over the life of the program (SERP 1992b). The manufacturer had to show that it had a national distribution and service system and had produced 100,000 units or more in the 17.5-22.4 ft³ size range per year for each of the last three calendar years prior to the bid. If the bidder could not meet this requirement, it would have to demonstrate its capability in this area by showing sufficient capital on hand, a national service network, and signed contracts with a national distribution network. SERP wanted to ensure that the units could be mass produced in a timely manner.

3.5.5 Tracking Requirement

Many utilities were reluctant to participate in the program unless they were assured of receiving detailed information on where the SERP units were installed. Therefore, SERP included tracking criteria in the RFP; initially proposals needed to state how tracking was to be performed, and manufacturers were responsible for tracking 25% of the units. The bidding manufacturers needed to provide detailed information to SERP on the tracking mechanism and anticipated tracking coverage.

(a) Interview with Liz Klumpp, Washington State Energy Office.

The bid score formula included two points (out of a total of 100 points) solely for the tracking system proposed by the manufacturer.

3.5.6 Delivery Schedule

The RFP required that deliveries to each member's service territory be made in proportion to the member's commitment, to ensure that each utility would receive the proper number of units to cover its contribution to the pool. The proposals were required to include a schedule and plan showing how delivery of the units into SERP members' service territories would be accomplished by the end of the delivery period which runs through June 30, 1997. The bid scoring formula gave favorable weighting to bids that showed the ability to quickly assemble and deliver the units, thus realizing energy-savings early in the program. This schedule needed to account for the total number of commercial models that the manufacturer traditionally had offered for sale as well as a rationale for delivery times.

3.5.7 Payment Schedule

In order to receive the incentive, the winning manufacturer had to provide SERP with monthly documentation indicating which retail outlet the unit would be shipped to, and the name and address of the purchaser of the unit. Under the original dealer-based payment system specified in the RFP, SERP was required to pay 90% of the incentive per refrigerator after receiving information on the retail outlet where the unit was shipped and the remaining 10% after receiving information on the final customer. The original dealer-based payment system was later renegotiated by SERP and Whirlpool. The new payment system agreed to by SERP and Whirlpool was a customer-based payment system in which the manufacturer receives 100% of the incentive per unit once final customer information confirming a sale is submitted to SERP.

3.5.8 Cross Border Sales Account

SERP realized that there would be logistical challenges in tracking SERP refrigerator sales since utility service territories do not coincide with refrigerator dealer customer bases. A unit purchased in one utility's service territory could be installed in another utility's service territory. This issue became known as the cross-border issue, and SERP set out to develop a policy to deal with this and other difficult situations.^(a)

From each utility's financial commitment, 4.27% was applied to a cross-border account to ensure that a utility would not be penalized if units were installed outside of its service territory. SERP uses funds from the trust account of the member where the selling dealer is located to compensate the winning manufacturer, regardless of where the unit is finally installed. However, if the unit is transported into a service territory of a non-participating utility (termed an external cross-border transaction), SERP reimburses the member who should have benefitted from the energy savings of the

(a) The cross-border policy was explained in a memorandum from Ray Farhang to SERP member utilities.

"exported" unit with funds from the cross-border account, thus allowing the member to provide an incentive for an additional SERP unit. Therefore, no utility ends up paying the full incentive without receiving the energy savings. If the unit is taken into the service territory of another SERP utility (termed an internal cross-border transaction), then that utility's trust account will pay the incentive, and no cross-border account funds are expended. All remaining funds in the cross-border trust account will be returned to utilities on a *pro rata* basis at the end of the program.

Another interesting situation arises when a SERP unit is installed in a zip code where two utilities operate; if only one of these utilities is a SERP member, then it is assumed that the unit is being used by a SERP-member customer and is not entitled to be reimbursed with funds from the cross-border account. It is up to the utility to prove if that is not the case and it is not responsible for the payment. In this situation the utility would receive an additional SERP refrigerator. If both utilities operating in the zip code are SERP participants, the utilities will pay a percentage of the incentive equal to the percentage of the customers in that area that are theirs. For example, if PG&E serves 70% of the homes in a particular zip code and SCE serves 30%, PG&E will pay 70% of the incentive amount.

3.5.9 Bid Timeline

Manufacturers were given 100 days (July 7 to October 15, 1992) to submit proposals. SERP agreed to notify finalists by December 1, 1992, and agreed to announce a winner on July 1, 1993. The SERP units entered the market in February 1994. The bid timeline was followed very closely; the only difference was that the winner was announced one day earlier than scheduled. See Table 3.2 for detailed information on the bid timeline.

3.5.10 Bid Scoring Formula

The bid scoring formula outlined in the RFP and listed in Table 3.3 explained how a manufacturer's proposal would be judged. Seventy-five points were available based on total energy savings, assuming a value of 7 cents per kWh, an annual cost discount rate of 6%, and a 19-year refrigerator life. The bid value was calculated as the present value in dollars of the savings generated by the proposed refrigerator, as the sum of a stream of eight shipment blocks. Because SERP wanted to ensure that a manufacturer would deploy as many units as possible early on in the program, the scoring formula values the stream of lifetime energy savings back to 1992 at a discount rate of 15%. This formula evaluated proposed models based on kilowatt hour savings rather than on the percentage by which the models exceeded the NAECA standard. Therefore larger models with through-the-door ice and water access scored better.

Of the 25 remaining points, 20 were awarded for corporate capability and reliability factors, 2 points for the tracking system, 2 points for successfully substituting for CFCs, and 1 point for having separate airflows between the refrigerator and freezer.

Table 3.2. Bid Proposal Timeline

Date	Activity
5/91 - 6/30/92	Utility Recruitment, Assist with Regulatory Issues
2/12/92	Pre-bid Conference with Manufacturers; distribution of the preliminary draft RFP
4/8/92	Draft RFP Comments due from Manufacturers
7/7/92	RFP Officially Issued
10/15/92	RFP Response Deadline
12/1/92	Announce Prototype Stage Participants
5/1/93	Prototype Deadline
7/1/93	Announce Contract
1/1/94	First Article Testing
Early 1994	Commence Commercial Deliveries
6/30/97	Last Deliveries to Retail Outlets

Table 3.3. Bid Scoring Factors

Factor	Points
Unit Energy Consumption, Incentive Payment Offer, Timeliness of delivery	75
Corporate Capability and Reliability	20
Improved Customer Tracking Mechanism	2
CFC-Free Refrigerant	1
CFC-Free Insulation	1
Separate Air Flows	1

3.6 The Revised RFP

After Whirlpool and Frigidaire were selected as finalists, SERP revised the bid scoring formula to place a greater emphasis on tracking. The revised formula retained the original 75 points for energy savings but devoted the remaining 25 points entirely to tracking; proposals that indicated the ability to provide SERP with information on 75% of the final purchasers of SERP units would receive the full 25 points, while proposals indicating tracking shares of 25% or less of the units would receive none of the 25 points. SERP made this change not only because of the importance to utilities of obtaining information on where the SERP units were being installed, but also because it was clear that 20 points for corporate reliability was no longer necessary given the size and market share of the two finalists.

4.0 The Winning Bid

On June 29, 1993, Whirlpool Corporation (Whirlpool) of Benton Harbor, Michigan, was announced as the winner of the competition. The first SERP model reached the market on February 28, 1994. Whirlpool's first SERP model was a 22-cubic-foot, two-door, side-by-side refrigerator/freezer that was 29.7% more efficient than specified in the 1993 federal standards.

The key energy-efficient components of the winning model were

- "fuzzy-logic" adaptive defrost control that constantly monitors conditions inside the cabinet and adjusts the defrost cycle accordingly
- thicker insulation in doors
- a more efficient compressor
- a bend in the defrost drain pipe to prevent hot air from seeping back in
- low-energy evaporation and condensor fans
- vacuum insulation panels, which are three times as efficient as foam (introduced in later SERP models in 1995).

As required, this model was CFC-free, substituting HFC 134a (made completely without chlorine) as the refrigerant, and substituting HCFC 141b (a less environmentally harmful blowing agent) as the insulation blowing agent.

The first-generation SERP refrigerators were 29.7% more energy-efficient than the 1993 federal standard, and look like other comparable 22-cubic-foot side-by-sides produced by Whirlpool and offer the same convenient features. Visible differences are minimal, with the SERP model having slightly thicker (1 1/4 inch) doors.

Whirlpool proposed to manufacture and distribute approximately 250,000 units of a variety of refrigerator models over the life of the program. Use of vacuum insulation panels in later models was specified in Whirlpool's proposal, and the first of these models was shipped during May 1995. The vacuum panels are placed in the sidewalls of the refrigerators and do not change the capacity or any features of the original model. This newer, significantly more energy-efficient (41% above 1993 standards) model replaced the original SERP model.

The key program features of Whirlpool's winning bid included the marketing (distribution) plan, the tracking system, dealer training, and the dollar incentive payment. These features are described below. PNNL was not allowed access to Whirlpool's proposal due to a commitment by SERP to

keep bid information confidential. Therefore information presented in this section was obtained through interviews with Whirlpool and SERP staff.

4.1 Marketing Plan

As part of the RFP, manufacturers were required to develop a marketing plan to distribute the SERP model. Whirlpool proposed to distribute the SERP models under three brand names: Whirlpool, KitchenAid, and Kenmore. Whirlpool would make these units available in the market areas served by the 24 utilities sponsoring SERP. Whirlpool agreed to set the factory price for the SERP units at a level comparable to other non-SERP models with similar features.

Since winning the competition, Whirlpool has produced several press releases and consumer brochures that explain details of the refrigerator to potential customers. Whirlpool's regional sales offices within the SERP service territories have been responsible for advertising in local media. According to Whirlpool, a national advertising campaign is not feasible since the target market is limited to the service territories of participating utilities. Extensive promotional efforts were exercised regionally through television and radio advertisements as well as full-page advertisements in newspapers and magazines. Most of these efforts were conducted collaboratively with regional retailers such as Sears and Circuit City.

Whirlpool's marketing plan also included a national road trip to familiarize utilities with the program. Whirlpool staff visited about 95% of the SERP utilities to discuss program implementation. In their efforts to establish regional SERP networks, Whirlpool provided utilities with contacts at the participating retailers and dealers (Whirlpool 1994).

Whirlpool has devised a separate marketing campaign to promote the more efficient SERP model with vacuum panels. This campaign includes new literature and more advertising campaigns. This marketing plan will promote the technical innovation of vacuum panels and stress their superior performance and effectiveness compared to foam insulation.

Additional details on Whirlpool's marketing activities were not available for proprietary reasons. SERP promotional materials and the SERP label are shown in Appendices B and C, respectively.

4.2 Tracking System

Whirlpool introduced their tracking system, ExacTrak™, to monitor refrigerator sales in compliance with the SERP contract. Under the ExacTrak™ system, dealers are directed to fill out a form on each SERP refrigerator sold. The form includes the model, color, date of sale, name and address of the selling store, selling price, and customer name and address. Whirlpool has prepared revised forms for the dealers in anticipation of the newer vacuum panel models which entered the market in May 1995. See Appendix D for a sample of this form.

To encourage retailers to complete and return the ExacTrak™ forms, Whirlpool charges a premium of about \$100 wholesale for SERP refrigerators. Whirlpool will subsequently reimburse the retailers for the premium amount after the retailer submits the ExacTrak™ information. In Phase I of the program, Whirlpool gave the dealers a rebate as well as an incentive. Dealers receive a rebate when they send in the ExacTrak™ card and an added incentive if they return it on a timely basis. The data entry for ExacTrak™ is handled by Whirlpool's third party contractor before Whirlpool itself eventually provides SERP with the actual sales information required for the incentive awards to be paid. Although the RFP stipulates a minimum tracking level of 25%, Whirlpool expects that nearly all SERP refrigerator sales will be tracked using this system. SERP expects the ExacTrak™ mechanism to eventually give utilities a very accurate picture of where the refrigerators are being sited.

4.3 Dealer Training

Whirlpool reported that four regional training sessions have been held. Refrigerator dealers were trained by a local sales force. An eight-page manual to train the dealers was developed by Whirlpool for use at their training. According to a Whirlpool source, about 80% of all targeted retail staff have attended the training sessions. Whirlpool will hold another round of dealer training now that Phase II is underway and the units incorporating the vacuum panels have been deployed. 1994 Dealer Training Materials are in Appendix E.

4.4 Payment System

The dealer-based payment system specified in the RFP was designed to pay the winner 90% of the incentive amount for the total number of SERP units that were shipped to a dealer located in the service territory of a SERP member. The remaining 10% would be paid when the winner had verified 25% of the sales to end consumers. Whirlpool's bid specified how this requirement would be met; however, after winning the competition, Whirlpool and SERP agreed to a customer-based payment system, where SERP would pay Whirlpool the agreed upon incentive for each verified sale of a SERP unit. This revised system was believed to lead to greater unit accountability and market flexibility.

4.5 Size of Unit in Whirlpool's Bid

Size was an important factor in Whirlpool's bid. According to a Whirlpool interview participant, "the size requirements in the preliminary RFP were in our opinion too restrictive and we didn't think we'd be competitive if our bid was restricted to the smaller units. SERP's final RFP allowed for larger units. It was important for us to be able to bid a larger unit because SERP used kilowatt hours as a measure, not percentage savings. The larger units saved more on a kilowatt hour basis."

5.0 Perspectives from the Utility and Appliance Industries

Telephone interviews with member utilities, nonmember utilities, major refrigerator manufacturers, and Whirlpool were conducted to gain insight to utility and manufacturer perspectives on all aspects of SERP. Although slightly different surveys were designed to target different groups, the surveys addressed the following issues:

- participation decisions
- program features and bid requirements
- accomplishment of SERP objectives
- appropriateness of the SERP approach
- likelihood of participating in a similar program in the future.

Twelve of the 24 SERP member utilities were interviewed as part of this study. These utilities were selected based on their geographic location and their level of participation (i.e., amount invested into the program). SERP member utility service territories cover 11 states and at least one utility per state was interviewed. The utility interview participants were

1. PacifiCorp, Oregon
2. Pacific Gas & Electric Company, California
3. Arizona Public Service Company, Arizona
4. Northern States Power Company, Minnesota
5. Wisconsin Power & Light Company, Wisconsin
6. Wisconsin Public Service Corporation, Wisconsin
7. Central Maine Power, Maine
8. New England Electric Service Company, Massachusetts
9. Western Massachusetts Electric Company, Connecticut
10. Long Island Lighting Company, New York
11. Jersey Central Power, New Jersey
12. Baltimore Gas & Electric Company, Maryland.

Most of the information presented on non-participating utilities was obtained through SERP planners involved in utility recruitment. Identifying contacts from nonmember utilities was a challenge. In many cases, a contact familiar with SERP could not be identified or had left the company. Thus, only a few non-participant interviews were conducted, and they focused primarily on the decision not to participate in the program.

A total of nine manufacturers, including Whirlpool, participated in the refrigerator manufacturer survey. The manufacturer interview participants were

1. Ebco
2. Frigidaire
3. General Electric
4. Marvel Industries
5. Maytag
6. Sanyo
7. Sub-Zero
8. U-line
9. Whirlpool.

Industry data show that the nation's top five household refrigerator manufacturers are General Electric, Whirlpool, Frigidaire, Amana, and Maytag.

5.1 Factors Considered in the Decision to Participate in SERP

Manufacturers and utilities considered different sets of factors in their decision to join SERP. However, the factor mentioned most often by both the utilities and manufacturers was the program's positive publicity. Manufacturers were also very aware of the positive impact on corporate image associated with winning the contract. While utilities examined the cost effectiveness of the program, manufacturers contemplated the marketability of the product and, more importantly, the manufacturability of such a product. Cost-effectiveness and short-term goals were the two main factors considered by utilities that ultimately decided not to join SERP.

5.1.1 Factors Considered by Utilities

Utilities considered a number of factors when deciding whether or not to join SERP. Factors mentioned most often by utilities included positive publicity associated with the program and its impact on their corporate image, the potential market transformation benefits of the program, the improved customer service to the utility's retail customers, involvement by the utility in an innovative and collaborative effort to improve energy efficiency, and support of the program by the utility's regulators.

Market transformation impacts were also mentioned as a very attractive feature of SERP. According to one respondent, "We already had an energy-efficient refrigerator program as part of our demand side management efforts; however, SERP had the potential to actually transform the market." Another respondent mentioned that market transformation programs offer improved customer service which, they believe, will help their utility remain competitive.

Additional factors mentioned by utilities included cost effectiveness of the program and overall program cost, whether other local utilities would join (viewed as a positive), anticipated demand for

super-efficient refrigerators (high demand viewed as a positive), SERP's positive impact on research and development, SERP's potentially positive impact on increasing the stringency of the 1998 refrigerator/freezer efficiency standards, and the positive environmental impacts of SERP.

SERP participants were asked to rate the participation decision factors on a scale of 1 to 3, with 1 being important, 2 being very important, and 3 being the most important. Ties in scores were discouraged, and all utility respondents were able to distinguish between the importance of their top three importance factors. Table 5.1 presents a summary of the factors mentioned by utilities and the associated scoring.

Table 5.1. Importance Factors in Joining SERP

Importance Factor	Total ^(a)	Most Important ^(b,c)
Customer service	5	2
Market transformation	5	2
Publicity	5	1
Regulator support	4	2
Innovative/collaborative program	4	2
Influence on 1998 refrigerator efficiency standards	3	1
Cost-effectiveness	3	1
Research and Development	2	0
Overall program cost	1	0
Other regional utilities joining	1	0
Anticipated demand for efficient refrigerators	1	0
Environmental impacts	1	0
Absence of consumer incentives	1	0
(a) Number of utility respondents that mentioned this factor. (b) Number of utility respondents that mentioned this factor as being most important. (c) One utility did not respond to this question.		

5.1.1.1 Cost Effectiveness Investigations

All but one participating utility reported investigating the cost effectiveness of SERP prior to joining the program. Of these, all but one found the program to be cost effective. A few respondents noted that their cost effectiveness analysis included the market transformation impacts of the program.

The one utility that found the program was not cost effective decided to join the program anyway because their utility commission was in favor of the program and because of the positive publicity associated with SERP.

5.1.1.2 Utility Commission Involvement in the Utility's Decision to Join

Most of the utilities interviewed stated that they approached their utility commission to request permission to join the program. In comparison, three utilities stated that their utility commission contacted them and "strongly suggested" that the utility join SERP. Two respondents did not know whether it was the utility or commission's idea to join the program.

5.1.1.3 Why Some Utilities Chose Not to Participate

Those utilities that decided not to participate in SERP were more difficult to identify and interview. In most cases, either the utility representative involved in the decision making process had left the company or could not be identified, or they were unfamiliar with the contents of the RFP. Because the survey revolved around the contents of the RFP, majority of these utility representatives had difficulty responding. Only one utility was knowledgeable about the RFP. This utility reported that it reviewed the RFP and chose not to participate because the program was not found to be cost-effective. This utility's management was indifferent about SERP and there were no aspects of the RFP that the utility took exception to.

Notes from SERP planners involved in recruiting utilities were reviewed as part of this study to determine why some utilities did not join SERP. Notes from twelve utilities that did not join were available for review. The most common barriers to participation mentioned were program cost-effectiveness concerns, budget/staff limitations, and the utilities' short-term goals/objectives. A summary of findings from these interviews as well as documentation on comments made to SERP recruiters during the utility recruitment process are itemized below:

- "We never considered SERP because DSM-type programs didn't fit into our short-term objectives."
- "We were tied up with other short-term programs and didn't have the resources to commit."
- "We were faced with tight budgets and had no funding to participate in such a program."
- "We don't anticipate needing any new capacity until 2015."

- "All the utilities in our holding company are working together on the design of appliance programs for the state, and don't have the time to devote."
- "The timing was bad; we had just gotten many small programs approved, and were busy launching and administering them."

Among those utilities that had reviewed the RFP and were familiar with the program, the main factor that contributed to their decision not to participate was the cost-effectiveness issue. The program did not pass their cost-effectiveness test, and they did not believe that the benefits to be received from this program would outweigh the costs of participation. The primary reasons these utilities gave for not participating are summarized below:

- "We did not want to contribute to a "winner-take-all" program."
- "The program was not cost effective."
- "We have limited resources, which we will commit elsewhere. The savings are uncertain and too risky; we want guaranteed savings."

One utility was prepared to participate in the program and ready to sign the contract, but missed the final deadline. Another utility mentioned that all the objectives SERP was trying to accomplish seemed redundant to existing activities and that the industry was already moving in that direction. This utility believed that with SERP, these changes would occur only a year or two faster than anticipated and the costs of participation were not worth receiving these benefits earlier.

As mentioned earlier, SERP did not pass the traditional cost-effectiveness tests applied by some utilities. However, these utilities may not have taken into account the market transformation benefits associated with this program. Since this Golden Carrot approach was an innovative market transformation program and no mechanism existed for utilities to measure the complete benefits of the program, many utilities relied solely on the conventional Total Resource Cost (TRC) or the Rate Impact Measure (RIM) tests to justify not participating. Perhaps more utilities would have participated had there been a device to measure program benefits other than basing them solely on direct acquisition benefits.

5.1.2 Factors Considered by Manufacturers

Manufacturers considered some of the same factors as utilities in their decision to submit a bid to SERP. For example, publicity and improved corporate image associated with winning the contract were important to manufacturers also. The refrigerator industry is extremely competitive, and favorable publicity is a key concern to the players. Manufacturers also evaluated their chance of winning. For example, smaller manufacturers had to assess their ability to manufacture the product and meet the mass production requirements. Also considered were the marketability of the proposed product, administration costs of the program, cost and technical resources needed to participate,

anticipation of the stringency levels of the 1998 refrigerator standards, chances of winning, and the spirit of competition.

Surprisingly, only two manufacturers mentioned the SERP incentive money as a key factor in their decision to submit a bid for participation, which is contrary to what many utilities expected. Manufacturers were more concerned about the anticipated publicity associated with winning the competition than the incentive money.

A few manufacturers disagreed with the "winner-take-all" policy for a number of reasons, including the risk of not winning after spending considerable resources on the competition. Small manufacturers were not in favor of the bid scoring formula because of the bias in favor of larger manufacturers; one manufacturer indicated that their company examined the chances of winning, and this played a key role in their decision not to submit a bid.

Another manufacturer reported that the most important factor their company considered and investigated was the return on investment. This respondent commented as follows:

"We were mainly concerned with the return on investment of the project, and evaluated it like any other investment. We were not concerned about the publicity aspects of the program or maintaining our market share. SERP units will replace other high-end units so the overall impact on market share will likely be unchanged."

All of the manufacturers that ultimately did not submit a bid to SERP based their decision on their current market share and product offerings. Most did not manufacture the product size specified in the RFP and did not have the mass production capabilities needed to meet the minimum bid requirements.

5.1.2.1 Manufacturer Bids

Nearly half of the manufacturer respondents interviewed said that they had submitted a bid to SERP. Those that did not submit a bid said they did not have the necessary resources to participate in a full-scale national program, which was key to winning the award. One manufacturer, however, stated that they would have participated just to get some publicity if the window of size requirements had been increased to include the smaller size and model refrigerator's that they currently produce. Another manufacturer reported that they might have submitted a bid had the program 1) targeted smaller refrigerators, 2) not been a "winner take all," and 3) compensated manufacturers for their bid efforts.

5.1.2.2 Manufacturer SERP Design Involvement

Manufacturers were asked if anyone from SERP contacted their company to solicit input or feedback on developing the SERP RFPs. All manufacturers of companies with a large refrigerator market share reported that they were contacted, and they provided input and feedback to the SERP

committee. SERP held a meeting in February 1992 and invited many manufacturers to attend and provide comments on the RFP. A few of the smaller manufacturers said that although they were not contacted directly by SERP, they did provide input to the various appliance organizations such as AHAM.

Manufacturers seemed to agree most in their opposition to a "winner-take-all" and, as one manufacturer put it, "loser loses all" competition. One manufacturer replied, "it's easy to promise the moon." SERP would have to rely on one manufacturer to deliver the product; with multiple winners, there would not have been as much reliance on a single manufacturer. Another manufacturer did not agree with the bid scoring formula, which he believed placed too much emphasis on the marketing, distribution, and production capabilities of the manufacturer. He believed that a smaller company would never win the competition, no matter how energy-efficient and innovative a product it could produce.

Manufacturers differed on their opinion in regards to SERP's responsiveness to their company's views and concerns over the preliminary RFP. Overall, however, SERP seemed to be responsive to manufacturers' concerns, although the final RFP did not differ significantly from the preliminary draft. As one respondent commented, "SERP did make some changes to the RFP based on our (and likely other manufacturers') input. They did not incorporate all the changes we suggested but in general were responsive to our views and concerns." Some manufacturers said that SERP was very responsive, while others disagreed, saying that SERP went forward with the original RFP. One manufacturer reported that manufacturer concern led to a modification of the size range for the refrigerators.

5.1.2.3 Appropriateness of \$30 Million Incentive Payment Amount

Manufacturers were also asked about the appropriateness of the \$30 million incentive payment and if they thought the industry would have responded to a lesser amount. Only a few manufacturers were able to provide a specific amount of a minimum incentive. Two manufacturers reported that the industry would have responded to half the amount (\$15 million). One manufacturer reported that if there was agreement on \$100 per unit, the incentive money could have been as low as \$3 million; there would simply be fewer units tendered. Another manufacturer stated that the incentive money could have been any figure, as long as it covered the R&D costs the company invested into the product, and any additional amount would be an added benefit. This respondent stressed that the financial incentive was not the most important factor, but that added publicity and promotion of the product were the driving factors. The one manufacturer respondent that thought it was about the right amount commented that it could have been less, but utilities would not have gotten as much in return. This respondent also reported subsidies for manufacturer research efforts might have resulted in the development of more innovative technology.

5.2 Perspectives on Program Features and Requirements

Both utility and manufacturer respondents were asked to give their opinion on specific features and requirements of the SERP RFP. Overall, SERP member utility respondents agreed with the majority of the program's features and requirements. Allowable refrigerator size and styles were the only program requirements where a number of utility respondents disagreed with the RFP. Manufacturers, on the other hand, disagreed with several features including the winner-take-all approach, the size range, and the bid scoring formula.

This section presents an overview of utility and manufacturer opinions regarding the key features and requirements of SERP. Results are summarized in Table 5.2. SERP had the final say on the program features, with input from the appliance industry.

Table 5.2. Utility and Manufacturer Attitudes on SERP Features and Requirements

SERP Design Feature or Requirement	Agree		Disagree		Indifferent		Don't know ^(a)	
	U	M	U	M	U	M	U	M
SERP Features								
"Winner-take-all" competition	10	2	1	6	0	0	1	1
Bid scoring formula	7	5	0	2	3	0	2	2
Timeline for bid submission	10	7	0	0	1	0	1	2
Selection process ^(b)	10	4	0	2	2	0	0	2
SERP Requirements								
Allowable refrigerator size	7	6	5	1	0	0	0	2
Allowable refrigerator styles	5	7	5	0	2	0	0	2
Mass production requirement	12	7	0	0	0	0	0	2
Energy-efficiency requirement	12	6	0	1	0	0	0	2
Tracking requirement	11	6	0	1	0	0	1	2
Delivery schedule	11	7	0	0	0	0	1	2
Payment schedule	12	7	0	0	0	0	0	2
U = Utility; n=12 M = Manufacturer; n=9 (a) Respondent was not familiar enough with the requirement to respond. (b) Whirlpool Corporation was not asked this question.								

5.2.1 "Winner Take All"

This "winner-take-all" feature was the most controversial aspect of the SERP competition. While most utility respondents agreed with this feature, due to its ability to spur competition, many had qualms about whether or not it was the best approach. Most manufacturers, on the other hand, disagreed with the approach and preferred multiple winners. Manufacturers felt they should be compensated for their proposal efforts, so the losers would not have to bear the total cost of participating in the competition.

5.2.1.1 Utility Perspectives on "Winner Take All"

Overall, utility respondents agreed with the "winner-take-all" feature of SERP, but some had reservations. Most knew the program feature was controversial and not supported by the appliance industry, but believed that competition was necessary to promote the most aggressive bids for energy-efficiency. Utilities also favored one winner in order to keep administrative costs at a minimum. Comments made by utilities that agreed with the "winner-take-all" program feature include the following:

- "The "winner-take-all" approach provides the most potential for innovation by the winner because of the larger incentive. In addition the market is transformed as competitors must innovate to stay competitive."
- "'Winner-take-all' was the only way to conduct a competitive procurement to get the most energy savings for the least cost."
- "The appliance industry is extremely competitive. If we could get one manufacturer to produce a product we were looking for, then we believed other manufacturers would follow."
- "I believe this was the best approach for SERP in this particular situation, but it may not be best for future similar programs. "Winner-take-all" was a great deal (less expensive) for the utilities, but the industry was not in favor of it."

One participating utility had very mixed feelings about the "winner-take-all" program feature. Although the respondent believed the policy was needed to stimulate the most aggressive bids, he also was uncertain about what the "losers" would produce in terms of energy-efficient products. Their involvement at some level may have been preferable.

The utility respondent that firmly opposed the "winner-take-all" policy stated that multiple winners should have been allowed in order to obtain greater penetration of energy-efficient products into the market. This respondent, a SERP member, went on to say that the single-winner policy was risky because one manufacturer, that the utilities had no experience with, would be "running the game."

5.2.1.2 Manufacturer Perspectives on "Winner Take All"

Manufacturers generally disagreed with the "winner-take-all" feature of SERP. Those who were opposed to this feature focused on the losers of the competition. Comments made by manufacturers that disagreed with the program feature include the following:

- "Manufacturers serve different segments of the market, so it makes sense to allow more than one manufacturer to participate. SERP would have got more bang for the buck with multiple winners."
- "This type of competition requires manufacturers to take major technological leaps, which we were not ready for. We were not going to produce a product without high reliability."
- "The loser has to eat all costs. The bid should have been based on a technical proposal. We devoted a lot of costly resources, which could have been used elsewhere, and gained nothing."
- "Losers should be compensated for their research and development efforts. The loser had to eat all costs under this policy and it was better if everybody shared in the efforts and the incentive funds."
- "The policy made smaller manufacturers reluctant to participate in competition with big manufacturers because the chances of losing were too high."
- "We would have been more comfortable with a program that was open to the entire industry. This is a very competitive industry and SERP was another opportunity for one manufacturer to "beat up" on another. We did not see the "winner-take-all" approach as being in the best interest of the industry as a whole."

The two manufacturers that agreed with the policy had reservations, but thought an "all or nothing" competition was needed to spur competition and produce the best product. One manufacturer thought that the losers of the program could still go out and sell the product they submitted as their bid on the market.

5.2.2 Bid Scoring Formula

The bid scoring formula was somewhat complex, and some utility respondents were indifferent or did not know much about this SERP feature.

The majority of the manufacturers agreed with the formula. The manufacturers that disagreed raised specific issues regarding the fairness of the scoring formula. Below are the comments of these manufacturers:

- "Weighting of the different components was not fair; the formula only allows the biggest companies to win. If a smaller manufacturer produced a refrigerator far more efficient than any other, they would still never have won because of their smaller company size. The weighting was shifted away from the technology aspect to the marketing aspect."
- "The CFC-free requirement wreaked havoc with us. CFC is a policy issue, and had nothing to do with energy-efficiency. SERP was trying to accommodate other issues as well, in addition to energy-efficiency, and this was not appropriate."

SERP's bid scoring formula intentionally favored large manufacturers because of the need to impact a large share of the market. SERP believed that the CFC-free requirement was necessary, given its direct relationship to energy efficiency. Because there was a general consensus in the refrigerator industry that CFC-free refrigerators were less energy-efficient, SERP wanted to ensure that a manufacturer demonstrated that this was not necessarily the case.

5.2.3 Timeline for Submitting Bids

Overall, utility respondents agreed with the timeline for submitting bids. They believed that some sort of timeline had to be in place and that the eventual timeline was adequate for the manufacturer's needs. One utility said that none of the manufacturers said they were put in a bind due to the deadlines.

Manufacturers agreed with the timeline for submitting bids. One manufacturer did comment that, while he agreed with the feature, a bigger manufacturer would have had more resources to respond with a better bid in a shorter period of time.

5.2.4 SERP Winner Selection Process

Utility respondents were split on the fairness of the selection process. One respondent stated that the criteria were fair and that the guidelines in the selection process were strictly adhered to.

One manufacturer was indifferent because he did not know what the other bids looked like. Those who felt that the winner selection process was not fair commented as follows:

- "There is no way that a 22-cubic-foot refrigerator will gain large penetration into the market. The Whirlpool bid must have included unrealistic information. There should have been a "sanity test" on the figures submitted in the bids."
- "The bid scoring formula didn't allow smaller companies to win."

5.2.5 Allowable Refrigerator Size and Styles

Utilities were divided on their agreement with the program's allowable refrigerator size. The utility respondents that agreed with the size requirements said the final allowable size range, which was quite broad, was reasonable and that it allowed the manufacturers the flexibility to determine how to best meet the energy-efficiency requirements of SERP while designing a product that their customers would want. One respondent stressed that while the chosen refrigerator is very large and satisfies a small share of the market, it represents a penetration into the market which can be built upon later as smaller units are introduced. Another utility said that the manufacturers needed to be left to design a unit that best meets their customer's needs and will be successful in the market.

The utility respondents who disagreed with the allowable size range believed that the upper size limit was too great and that the winning Whirlpool unit was too large. They argued that the very large units satisfy only a small share of the market and don't address the needs of consumers who can only afford smaller units. One respondent commented, "In hindsight, the 'winner-take-all' approach was bad because only a small segment of consumers can afford the energy-efficient refrigerator offered by Whirlpool, and therefore only a small segment of the market is covered." However, the remaining utility respondent who disagreed with the allowable size range stated that the manufacturers should have been allowed even more flexibility.

SERP did not specify a style of refrigerator in the RFP nor did SERP restrict any refrigerator styles. This was left up to the manufacturer. Most utility respondents agreed with this decision, arguing that the flexibility in styles allowed manufacturers to design an energy-efficient product that meets their customer's needs. One respondent stressed that once a style (any style) is introduced into the market other styles will follow, which is consistent with the market transformation impact envisioned.

The utility respondents that disagreed with SERP's decision to leave refrigerator style choices up to the manufacturers believed that a side-by-side style should not have been allowed because of its limited penetration in the market. One went on to say that this style is very unpopular in its service territory.

Although the draft RFP had specified a more limited window of allowable size, the initial RFP was revised based on manufacturer input to allow for a broader range of sizes. Manufacturers generally agreed that the allowable refrigerator size didn't pose any problems. Although many of the manufacturers interviewed could not participate in the competition due to the window of size requirements and the size of their models, they agreed that SERP captured the best size range to market with the highest potential for energy savings. Some manufacturers felt that while they agreed with the size requirements, SERP should have realized that the refrigerator chosen would address only a small share of the market. Another manufacturer indicated that the size requirements needed to be stated more specifically, indicating an energy-efficiency requirement different for each size and model.

5.2.6 SERP Mass Production Requirement

SERP's mass production requirement was not a controversial program feature; all utility respondents and most manufacturer respondents agreed with this SERP bid requirement. Mass production was considered critical to the program's success because it would reduce the per-unit costs of energy-efficient units. Manufacturers agreed that this capability was necessary for a successful national program.

5.2.7 Energy-Efficiency Requirement

SERP's energy-efficiency requirement was also not a controversial program feature; all utility respondents and all but one manufacturer agreed with this requirement. The utility respondents stated that the 25% improvement over 1993 standards was technically feasible and offered utilities sufficient return on their investment. Manufacturers also agreed with the energy-efficiency requirements and thought that the requirements were reasonable and realistic. One manufacturer, however, expressed concerns about the energy-efficiency level set for SERP. This respondent believed the 1993 refrigerator standards and the SERP requirement were too stringent. He was also in disagreement with negotiations for the 1998 standards.

5.2.8 Tracking Requirement

Most utility and manufacturer respondents stated that they agreed with the tracking requirements of SERP. Tracking was said to be a very important aspect of the program for a number of reasons. First, SERP refrigerator sales data are vital to utilities to determine their return on investment. Second, since a large number of utilities are program participants, a way of allocating costs to specific utilities was critical. Third, it would allow the market transformation impacts of the program to be determined nationwide. Last but not least, the tracking system would reduce administrative burden for utilities by placing responsibility for tracking on the manufacturer.

Manufacturers that agreed with the tracking requirement responded that it was an essential part of the program's success. The manufacturer respondent that was in disagreement with the requirement viewed tracking as one of the program's biggest problems. The respondent stated that the administrative costs associated with tracking were too high and the benefits of SERP were not enough to recover the costs of tracking the product and data. Another manufacturer commented that while he saw the need for tracking, smaller companies do not have the resources necessary to track due to the high associated administrative costs.

5.2.9 Delivery Schedule

All of the utility and manufacturer respondents who were familiar with the delivery schedule requirements specified in the SERP RFP agreed with the schedule. Utilities believed that a delivery schedule needed to be specified so they would know when the energy-efficient refrigerators would be

brought to market. Some of the respondents mentioned that they would have preferred a quicker delivery schedule, but thought this would have been unrealistic because manufacturers needed time to perfect their energy-efficient technology and gear up for production. Manufacturers did not think the requirement posed any problems.

5.2.10 Payment Schedule

All utility respondents agreed with the final payment schedule. Utilities reported that the requirement was adequate, that paying for the refrigerators on a per-unit basis made the most sense, and that it fit into the utility budgeting cycle. One respondent stated that he initially believed the payment should come directly from the utility instead of SERP, but that he was not opposed to the final decision.

All the manufacturer respondents who were familiar with the payment schedule agreed with this requirement. One manufacturer commented that smaller companies were unable to take a financial hit up front whereas bigger companies could afford to front the capital more easily.

5.3 Concern Over Free Riders^(a)

Half of the respondents were concerned that utilities not participating in SERP would realize the benefits of SERP without paying for it, because their customers can buy the SERP units at the expense of the Cross-Border Trust Account. Had these utilities joined, costs per utility could have been reduced. A few utility respondents believed that some utilities made a conscious decision not to join SERP because of the strong possibility that they would benefit anyway.

Most utilities that were not concerned with the free rider issue said it was a non-issue because the program is designed so that utilities do not have to pay for SERP units installed outside of their service territory. However, some expressed concern that this may be happening because of the problems with the tracking system.

5.4 Appropriateness of the SERP Approach

Utilities and manufacturers were asked if they believed SERP was the best way to encourage energy-efficient technology introduction in the appliance industry. In general, the utility respondents who reported that SERP was the best approach believed that SERP seemed like a good opportunity for their company at the time. One respondent mentioned that it represented a good market transformation opportunity. Another said that the SERP concept was a good one, but there needed to be more styles and sizes of refrigerators available to make the program successful.

(a) Traditionally the term "free rider" has been used in DSM evaluation studies to describe consumers who would take a specific energy-efficiency action (for example, installing weather stripping) regardless of whether a conservation program were in place to promote that action. In this report, the term free rider applies to utilities who may benefit from SERP without helping to pay for it.

Comparably-attractive alternatives to SERP mentioned by utilities included consumer education programs to increase the demand for energy-efficient units, consumer rebates, direct partnerships and tiered incentive/funding programs, and lobbying for tighter energy-efficiency standards.

The utilities that reported SERP was not the best way to encourage energy-efficient technology introduction in the appliance industry were disappointed that Whirlpool's winning model was based on currently available technology. One said that he wasn't sure what approach might have worked better, but believed that the utilities had wasted money on paying for technology that was already available but not utilized. The other utility said that the utilities may have been better off paying to promote existing technology to consumers.

The manufacturer respondents who reported that SERP was the best approach agreed that the program was successful in introducing the best technology due to the competition it created. One manufacturer commented, "SERP was the best way to mass produce an energy-efficient product, but if SERP wanted to push the technology level through the industry, it needed to share the incentive money with all manufacturers because the program did not change the industry behavior."

Some manufacturers reported that SERP was not the best way to encourage energy-efficient technology in the industry and had alternative approaches to offer. Two of the respondents believed that traditional manufacturer rebates would have worked best. One manufacturer also stated that the industry should allow market forces to work. A few manufacturers reported that tighter energy-efficiency standards mandated by DOE would work the best.

Other comments from manufacturers were as follows:

- "A collaboration of manufacturers should be formed, and funds for R&D costs should be given to them to work together."
- "The utilities should reach the consumers through education. Industry has enough competition as is, and they don't need added competition. Consumer education is key."
- "SERP helped to accelerate the introduction of energy-efficient technology in the market, but this would have come anyway without the program, it just would have taken a little longer."

5.4.1 Refrigerator/Freezers as an Appliance Category Choice for SERP

Utilities and manufacturers were asked if refrigerators were the best appliance category choice for the SERP approach. All utility respondents reported that it was. A number of reasons were given for the attractiveness of refrigerator/freezers for a SERP-type program. Several utilities said that refrigerator/freezers were the best candidate because they are greater energy consumers than are other appliances. Another utility reported that refrigerator/freezers were a good choice from a political and technical standpoint -- every household has one, so the program was able to capture notoriety and public interest along with energy efficiency.

Most manufacturers that responded agreed that the refrigerator was the best appliance category for the SERP approach, given the high energy consumption and the large industry. One commented that the refrigerator was appropriate because the technological innovations resulting in refrigerator research could be transferred to other appliances. One manufacturer did not agree that the refrigerator was the best appliance for the program, stating that refrigerator research in energy efficiency is at a point of diminishing returns and is not cost effective for the consumers. Another manufacturer respondent did not know if the refrigerator was the best appliance to use and thought horizontal axis clothes washers may have been preferable. However, this respondent also added that refrigerators were able to be improved by making incremental changes to current models, so huge investments in retooling didn't have to be made by manufacturers.

5.4.2 Other Potential Appliance Candidates for a SERP-Like Program

Both utilities and manufacturers were asked what other appliances might be good candidates for a SERP-like program. Utilities mentioned a number of candidates, with none being the clear winner. Candidates included hot water heaters, air conditioning systems, washing machines, heat pumps (water heating, geothermal, and entire heating/cooling systems), heating systems, water heaters, dishwashers, stove/ranges and room air-conditioners.

Manufacturers mentioned a number of candidates as well, but most of the respondents said that they did not know because they specialized in refrigerators. Appliances mentioned were washer/dryers, dishwashers, hot water heaters, air conditioning systems, and lighting. One manufacturer stated he could not think of another appliance that would be appropriate since a refrigerator is the only appliance that almost everybody has that has high energy consumption and continuous usage. There are other high-consumption appliances, but usage is usually intermittent. The majority of manufacturers could not respond to this question because they were unaware of the potential of other appliances.

Table 5.3 presents the number of utility and manufacturer respondents who reported each appliance category.

5.5 Likelihood of Participating in a Similar Program in the Future

Utilities and manufacturers were asked to comment on the likelihood that their company would participate in a venture similar to SERP if it were available in the future. Although none of the utility respondents said they definitely would participate, most said they might participate again. These utilities believed in the SERP concept of transforming the market. The primary reason that some utilities said they would likely not participate in the future was because of their disappointment in the implementation of SERP, mainly in the area of tracking.

Table 5.3. Responses on Alternate Appliance Categories

Appliance Category	Number of Responses	
	Utility	Manufacturer
Air conditioning system	7	3
Hot water heater	6	1
Washer/Dryer	5	2
Standard heating system	3	0
Heat pump heating system	3	0
Dishwasher	2	1
Stove/Range	2	0
Water heater	2	0

Roughly half of the manufacturer respondents reported that they might participate. Two of these respondents commented that it would depend on the specifics of the program. A few respondents stated they would not participate if the competition involved a "winner-take-all" feature. One manufacturer reported they would participate if the RFP applied to their specific market, even if it involved a "winner-take-all" component. Another manufacturer stated that it would depend on whether the program meets the company's return on investment requirements and whether it stimulates sufficient interest within the industry.

One manufacturer reported that it was very unlikely that his company would participate in the future, and another stated they definitely would not participate. One manufacturer commented, "I can't speak for the company, but I would not recommend participation as the technology officer, unless the winning bid would be determined only through an RFP, as opposed to an RFP and a prototype, and it is not a 'winner-take-all' competition."

6.0 Preliminary Implementation Findings

A key objective of this study was to identify initial implementation challenges that have arisen since Whirlpool began shipping SERP refrigerators to retailers in early 1994. Since no other energy-efficiency collaborative of this kind or scale has been undertaken in the past, early implementation issues were considered very important. This section presents findings based primarily on interviews with SERP utility members and Whirlpool.

6.1 Whirlpool's Perspective

Whirlpool respondents reported two SERP administrative challenges that needed to be resolved. The first was a cash flow problem and the second was the lack of accurate zip code data for SERP utility service territories.

Whirlpool respondents expressed frustration that the first payment for verified SERP unit sales was not received until April 1995, even though Whirlpool reported that they had submitted customer and sales data in compliance with the SERP tracking requirements. SERP, on the other hand, reported that incentive payments to Whirlpool had not been made because adequate tracking information had not been provided. According to SERP, the first invoice for SERP units was received on November 30, 1994, however it was not readable electronically by SERP. According to SERP, the first electronically readable invoice was not received until March 3, 1995. According to Whirlpool, however, the first invoice received on November 30, 1994, met all contractual obligations between SERP and Whirlpool.

The second challenge for Whirlpool was obtaining accurate zip code information on SERP utility service territories. Zip codes are provided by SERP utilities and used by Whirlpool to determine which appliance dealers to ship SERP units to and which utility service territory a SERP unit should be credited to. Whirlpool reported receiving numerous zip code changes and updates, creating an administrative burden for those responsible for SERP unit tracking and frustration for dealers who market SERP refrigerators. The zip code changes have caused frustration for a number of Whirlpool dealers and stores; these retailers were originally told they could market the SERP refrigerators (based on the original zip code list) but later were told they could not market the refrigerators because the zip code list had changed. This problem was intensified because SERP implemented zip code changes immediately, thereby making SERP sales that were eligible when the sale occurred no longer eligible when the data were submitted. According to Whirlpool, changes in zip codes have had a negative impact on SERP refrigerator sales. This is a challenge Whirlpool had not anticipated. At the time of this study, Whirlpool reported that it was working with SERP to resolve this problem.

6.2 SERP Utilities

All utility respondents who were familiar with the SERP unit tracking system (11 of the 12 respondents) complained that it was not working as they anticipated. All were frustrated because the

information they needed on SERP units sold in their service territory had not been provided as they believed had been agreed upon. In addition, some utilities complained that SERP refrigerators in their service territories were being priced higher than comparable non-SERP units. These interviews took place during March and April 1995.

Some utilities were very concerned that they may be paying for units that were not installed in their service territory. Utilities that have needed to report SERP energy savings numbers have had to collect this information on their own, which has involved some degree of guesswork. This was particularly frustrating for some utilities because one of the more attractive features of the program was the minimum amount of utility administrative support anticipated. The utilities had not planned to collect this information, which is both burdensome and costly to obtain. Some utility respondents reported that SERP management had not been responsive to their concerns over the SERP tracking problem. One utility representative said that SERP management had given him the impression that his utility should collect these data themselves. This was particularly frustrating to some utilities because they believed this information was to be provided under the SERP agreement.

Contrary to utility perception, Whirlpool claims that its tracking system, ExacTrak™, is working as anticipated and has exceeded the 75% tracking performance level specified in its contract with SERP. According to Whirlpool, this tracking performance percentage fluctuates as Whirlpool dealers submit ExacTrak™ forms on a periodic basis. Whirlpool remains confident of attaining the 75% contractual level for the program. A Whirlpool respondent commented as follows in May 1995:

"We have definitely exceeded the percentage return required in our agreement to SERP: 82% of all SERP units shipped out get responses from dealers, 10% of all units shipped do not get reimbursed because they go to dealers outside the utility service territories, and 8% of responses remain outstanding. We are aware of the utility dissatisfaction, but that is not our problem to solve since Whirlpool has been and continues to meet all of SERP's contractual requirements in supplying consumer information.

6.3 Sales of SERP Units

At the time interviews were being conducted as part of this study (March-April 1995), SERP had not released any sales information to its members and, therefore could provide no information regarding SERP unit sales. Whirlpool was willing to provide some general comments on SERP unit sales, but would not release specific sales numbers.

Whirlpool indicated that sales of SERP models were meeting the company's expectations in terms of sales per month. According to Whirlpool, market share remained essentially unchanged because SERP unit sales took the place of other Whirlpool standard units. A Whirlpool respondent explained, "On one hand, SERP publicity should be increasing sales of these units, but on the other hand, the dealer has to fill out paperwork that is time consuming and may not push the program because it is more burdensome for them. Basically, these two forces cancel each other out."

The 1995 SERP models incorporating vacuum panels were introduced into the market in May of 1995. These units are 11.8% more efficient than the SERP units introduced in 1994 and are 41% more efficient than the 1993 federal standard. Because these advanced units were introduced only recently, no information regarding their sales was available. It is expected that dealers will wait until the 1994 units are sold before attempting to sell the 1995 units.

6.4 Additional Rebates for SERP Units

Prior to SERP, seven of the 24 SERP member utilities offered energy-efficient refrigerator rebate programs (see Table 6.1). The Long Island Lighting Company (LILCO) ran a 16-month rebate program in conjunction with the New York State Energy Office (NYSEO). This program expired on April 4, 1994 and, because LILCO was participating in SERP, it decided that an additional refrigerator program was unnecessary. Similarly, Northern States Power, which offered a \$20 rebate for the purchase of an energy-efficient refrigerator, decided to discontinue this rebate program after joining SERP. Wisconsin Electric Power offered a \$50 rebate in calendar year 1992 for units 20% better than the 1993 standard, but also discontinued this program after joining SERP. The other SERP member utilities who offered refrigerator rebates prior to SERP were the Northern California Power Agency (NCPA), the Sacramento Municipal Utility District (SMUD), Pacific Gas & Electric (PG&E) and Southern California Edison (SCE).

At the time of this study, four of the 24 SERP utility members offered rebates to customers who purchased the SERP units. Six of the 14 utilities under NCPA participated in SERP; one of these six, the City of Palo Alto, offered the rebate referenced in Table 6.1. In calendar year 1994, both SCE and SMUD offered a \$75 rebate for any refrigerator that was CFC-free and 25% better than the 1993 standard. SCE decided to discontinue its rebate program in 1995 and SMUD reduced its rebate to \$45 in 1995. PG&E exempted SERP models from its refrigerator rebate program in 1994 after deciding that two incentive programs for the SERP unit were unnecessary. However, in 1995 PG&E included both the 1994 and 1995 SERP models in its rebate program.

Table 6.1. Refrigerator Rebate Programs Offered by SERP Member Utilities

Utility	Pre-SERP Rebate Amount	Post-SERP Rebate Amount
Long Island Lighting Co./NYSEO	\$90	None
Northern California Power Agency	\$125	\$75
Northern States Power	\$20	None
Pacific Gas & Electric	\$50, \$75, \$100	\$50, \$75, \$100
Sacramento Municipal Utility District	\$75	\$45
Southern California Edison	\$75	None*
Wisconsin Electric Power Company	\$50	None
* Southern California Edison's refrigerator rebate ended in the Fall of 1994.		

7.0 Key Findings

The purpose of this section is to highlight significant findings of the study and identify important lessons learned. The following process-related topics are discussed below: utility and manufacturer decisions to participate in SERP, manufacturer involvement in SERP program design, reactions of respondents to program features and requirements, accomplishments of SERP objectives, appropriateness of the SERP approach, likelihood of participants' involvement in similar programs in the future, and preliminary administration and implementation findings.

7.1 Participation Decisions

- The most common factors considered by utilities in their decision to participate in SERP were positive publicity and impact on corporate image, market transformation benefits, improved customer service, and support by regulators.
- Many of the utilities that did not join SERP did not give strong consideration to the program and were simply not interested in considering the program. Those utilities that did consider joining SERP, but chose not to, reported that the program did not meet the cost effectiveness requirements set by their company.
- The most common factors considered by manufacturers in their decision to submit a bid were their ability to manufacture and distribute the product, and potential publicity.
- All of the manufacturers interviewed by PNNL that did not submit a bid to SERP said they based their decision on the incompatibility of SERP requirements and their current market share (production and distribution) and product offerings (size range).

7.1.1 Utilities

As the possibility of deregulation loomed over the utility industry, many utilities were attempting to increase their competitive advantage by improving customer service and responsiveness to customers' needs, in addition to reducing costs. Some utilities viewed participation in SERP as an affordable way to increase their visibility with customers while delivering a conservation service important to their regulators. SERP's turn-key approach meant that substantial staff time would not need to be committed to program design and administration. None of the participating utilities PNNL spoke to were confronted with strong opposition from their regulators.

SERP planners found that many utilities were simply not interested in joining SERP. Some had never been particularly interested or involved in DSM-type programs, and others were moving away from DSM-type programs in light of the changing utility environment. Those utilities that considered joining SERP but didn't reported that they did not find the program to be cost effective based on their

utility's evaluation tests. The evaluation tools used were those designed to measure the benefits of traditional DSM programs.

Utilities will need to be convinced of the merits of examining the long-term benefits of these programs rather than the direct conservation acquisition benefits if more utilities are expected to willingly participate in future programs of this type. Furthermore, utility commissions will need to be convinced that traditional DSM measurements do not accurately reflect the indirect benefits of market transformation programs.

7.1.2 Manufacturers

Like utilities, manufacturers viewed the potential publicity as a very attractive aspect of the program. They reasoned that the competition could bring substantial press coverage and media attention to the winner. SERP planners knew that publicity would be important to manufacturers and may have even underestimated its value.

The SERP RFP placed considerable importance on corporate reliability and production and distribution capabilities. Most small manufacturers were familiar with the SERP RFP, but did not believe they had the ability to effectively compete with bids by the "big five" refrigerator manufacturers. Once again, PNNL did not have access to the names of the SERP bidders, but it appears from our interviews that only the larger manufacturers were viable competitors. None of the smaller manufacturers reported that they submitted a bid.

7.2 Manufacturer Involvement with SERP RFP Design

- All manufacturers contacted were familiar with SERP. Most provided input to SERP during RFP development, either directly or through the industry association.
- Overall, manufacturers viewed SERP as responsive to their concerns.

SERP planners were keenly aware of the importance of involving the refrigerator industry in designing the program, especially in developing the RFP. Without manufacturer interest and participation, they knew there would be no program. PNNL's investigation found that SERP was able to generate substantial industry involvement in crafting the RFP. All manufacturers, even those that did not participate in the competition, were well aware of the program and the RFP. All manufacturers interviewed said they had the opportunity to provide input to SERP regarding the RFP. Most reported that SERP was responsive to their questions and concerns, even though many of these concerns and requests were not reflected in the final RFP. For example, many manufacturers were opposed to the "winner-take-all" approach proposed by SERP, yet SERP chose to retain this program feature.

7.3 Program Features and Requirements

- About half of the manufacturers (4 out of 9) interviewed reported that the industry would have responded to a bid pool less than \$30 million; only one manufacturer said that the \$30 million pool was not enough. Just two manufacturers mentioned the amount of incentive money as a key factor in their decision of whether or not to submit a bid.
- While most utility respondents (10 of 11) participating in SERP agreed with the "*winner-take-all*" approach, most manufacturers (6 of 9) disagreed with this feature.
- Both utilities and manufacturers overall agreed that the *bid score formula* was fair; many utilities were unfamiliar with the complex formula and were indifferent.
- Both utilities and manufacturers agreed that the *timeline* was fair.
- The majority of both utilities and manufacturers reported that the SERP *winner selection process* was fair.
- Utilities were divided on whether the *allowable refrigerator size and style* requirements were best for the program; manufacturers generally agreed that the chosen requirements were fair.
- Both utilities and manufacturers agreed on the *mass production requirement*, the *tracking requirement*, and the *delivery schedule*.
- Half of the utility respondents were concerned with the issue of *free rider utilities*.

The \$30 million incentive pool was sufficient and may have been more than needed to prompt bids by large refrigerator manufacturers. As mentioned previously, manufacturers stated that other factors, such as the potential publicity associated with winning SERP, were key reasons why they chose to submit a bid. However, the amount of the incentive pool may have had an impact on the perceived value of other key factors. For example, the amount of the incentive pool may have impacted the perceived value of publicity from the manufacturers' perspective.

The \$30 million incentive did not, however, appear large enough to prompt a bid that involved new technology or would involve a major change in a manufacturer's production line, an expensive and risky undertaking for manufacturers. As evaluators, PNNL did not have direct access to the bids, but manufacturers interviewed reported that their bids generally involved "off the shelf" efficiency improvements that could be incorporated into their current production lines. A larger incentive amount may have led to more advanced, innovative bids from manufacturers. However, it is our view that the incentive would have had to be substantially larger in order to entice manufacturers to allocate more funds to R&D and to consider altering their production line.

The decision by SERP to follow a "winner-take-all" program approach reflects the general belief by utility participants that this approach was needed in order to obtain the most aggressive and innovative bids by manufacturers. Although manufacturers were generally opposed to this program approach, most of the large manufacturers submitted bids. From this perspective, the "winner-take-all" approach was successful for utilities. On the other hand, one could infer from this that competition was necessary only to the point of product development. It could be argued that some form of competition at the distribution stage would help to increase the effectiveness of other aspects of the program. For example, having two winners might have led to greater marketing support by manufacturers since two competing manufacturers would be promoting the SERP refrigerator. As the sole manufacturer of the super-efficient refrigerator, a single winner may have less incentive to aggressively market the product. Having more than one winner might also reduce the risk of nonperformance by the manufacturer since another manufacturer would likely perform (the "don't put all your eggs in one basket" argument). Lastly, more than one winner may have led to the introduction of alternative energy efficiency improvements.

Overall, utilities and manufacturers agreed with SERP committee decisions regarding program features and requirements. Some utilities believed that a smaller model should have been required; their argument being that these units are the most affordable and enjoy the largest market share. SERP planners decided to allow significant freedom to manufacturers in developing their bids and to not significantly restrict the bidder's choice of styles, models, or marketing activities. SERP planners favored allowing manufacturers the flexibility to develop a product that would best meet their customers' needs. SERP planners also believed that SERP technology would likely spill over to other refrigerator models and sizes in time.

The SERP RFP allowed flexibility to manufacturers in terms of refrigerator size and styles so that manufacturers could develop a product that would best meet their customers' needs. The RFP also placed considerable value on the market and marketing related capabilities of the companies submitting bids. The SERP RFP clearly favored bids by manufacturers with 1) a large share of the refrigerator market, 2) well established national channels of distribution, and 3) marketing expertise. Some of the manufacturers interviewed as part of this study were lacking in one or more of the above areas and said they were at a disadvantage compared to the "big five" refrigerator manufacturers. Even if they developed a superior energy-efficient technology, they said, it was unlikely that they could win the competition. Additionally, because the bid score formula was based on kWh savings, instead of the percentage by which a model exceeded the standard, larger units had an advantage. Therefore, manufacturers who produced smaller units did not fare as well in the competition.

SERP planners designed the program to value bidders' marketing-related capabilities to ensure that the winning refrigerator would be widely available to consumers in all participating utility service territories. This decision was consistent with the market transformation goals of SERP planners.

7.4 Accomplishment of SERP Objectives

SERP made progress toward the following three objectives.

7.4.1 Introduction of Energy-Efficient Refrigerator Technology

- One of SERP's main goals was to prompt the introduction of energy-efficient refrigerator technology. This goal was achieved by Whirlpool's introduction of refrigerator models that exceed the 1993 federal energy efficiency standard by 29% to 41%.

Although most of the technology used to gain the energy-efficient improvements was "off the shelf," the program nonetheless made it possible for Whirlpool to bring the technology to market when it did. It appears unlikely that Whirlpool would have introduced these new refrigerator models as soon as it did in the absence of SERP.

7.4.2 Influencing the Stringency of the 1998 Refrigerator Standards

- Most utilities reported that SERP will have either a significant impact (4 of 11) or some impact (5 of 11) on influencing the standards.
- While many manufacturers (5 of 9) reported that SERP will have some impact, others (4 of 9) reported that SERP will have no impact on the standards.

It is likely that SERP had at least some effect on the proposed 1998 NAECA standard. While the technical aspects of the SERP model reportedly were not discussed in the negotiations, the SERP model was referenced as evidence that an energy-efficient CFC-free refrigerator could be produced cost effectively.^(a)

7.4.3 CFC Phase Out

- Most utility respondents (8 of 12) believe that SERP will have an impact on speeding up the phase out of CFCs, while nearly all manufacturers (8 of 9) reported that SERP will have no impact.

The Montreal Protocol, incorporated into the Clean Air Act Amendments of 1990, mandated that CFCs no longer be produced in the U.S. after January 1, 1996. One of SERP's goals was to speed this phase out; utilities and manufacturers differed in opinion regarding whether SERP would accomplish this goal. Manufacturers interviewed said they were already working on CFC replacement compounds prior to SERP in order to comply with the protocol; therefore, they did not believe SERP had any influence. Utilities, on the other hand, argued that SERP likely influenced the speed of the phase out in a couple of ways. First, the CFC-free requirement in the SERP RFP prompted manufacturers to address the need for CFC-free units in their bid. Second, the presence of the CFC-free SERP refrigerator in the marketplace likely would prompt other manufacturers to offer

(a) From personal communication with Howard Geller, American Council for an Energy-Efficient Economy.

their own CFC-free units to compete with SERP refrigerators. Also SERP showed that an energy-efficient, CFC-free refrigerator could be produced.

PNNL did not evaluate the presence of competing CFC-free refrigerators in the marketplace as part of this study. Even if PNNL had, it would be difficult to determine whether or not manufacturers would have introduced these units anyway in the absence of SERP. However it appears likely that SERP had at least some impact on phasing out the use of CFCs associated with refrigerators.

7.4.4 Other Accomplishments

- Participating SERP utilities reported that SERP showed that the possibility exists for collaboration between utilities and the industry.

Many utilities reported that SERP had some significant accomplishments that reached beyond those specifically stated. SERP's innovative market transformation approach proved that it is possible for a large number of utilities to pool their resources and gain the attention and participation of a major U.S. manufacturer in an energy-efficiency program. However, some of these utilities wondered if the approach could be successfully replicated due to competitive pressures now facing the utility industry.

7.5 Appropriateness of SERP Approach

- Utilities were divided on the SERP approach: some (3 of 8) agreed SERP was the best approach, others (3 of 8) were indifferent, and the rest (2 of 8) reported that SERP was not the best approach. Alternative approaches mentioned included consumer education programs, consumer rebates, direct partnerships and tiered incentive/funding programs, and tighter energy-efficiency standards.
- Manufacturers were also divided on this issue: some (3 of 9) manufacturers agreed it was the best approach and others (4 of 9) said it was one of many approaches. Six of the manufacturers said they did not like the "winner-take-all" approach. Contrary to common belief, a few manufacturers mentioned regulations as the best approach.
- All utilities and all but one manufacturer agreed that refrigerators were the best appliance category to use in a SERP type program because of their continuous usage, market penetration, and high energy consumption.
- Other potential appliance candidates for a SERP type program mentioned by both utilities and manufacturers included air conditioners, hot water heaters, and washer/dryers.

7.6 Likelihood of Participation in the Future

- A similar proportion of utilities reported that they would probably participate in SERP-type programs in the future (4 of 12), they might participate (3 of 12), or they probably won't participate (3 of 12); only 2 of 12 utilities reported that they will definitely not participate.
- Most manufacturers (4 of 7) reported that they might participate in a similar program in the future.

The likelihood of participation in a similar program by both utilities and manufacturers will depend on a number of factors and circumstances. SERP proved that the approach can work, but whether or not it can be successfully implemented with another product category or industry under different environmental and political circumstances remains to be seen. Utilities are, however, often choosing to conduct market transformation programs like SERP instead of traditional DSM programs.

7.7 Administration and Implementation

- Many utilities were disappointed about the lack of information on SERP unit sales.
- Whirlpool was frustrated with the slowness of SERP's incentive payments on units shipped, and the unanticipated frequency of zip code changes submitted by utilities.
- Whirlpool reported that 90% of its SERP units have been priced comparably to other similar Whirlpool models; the majority of utilities, however, reported that SERP models sold in their service territory are priced higher.
- Whirlpool reported that they provided the agreed-upon level of SERP promotion in member utility service territories; however, utilities were generally disappointed with the amount of advertising observed in their service territories.
- Whirlpool reported that SERP unit sales were meeting its sales expectations.
- SERP was not able to determine whether SERP unit sales were meeting expectations at the time of this study.

Whirlpool expressed concern over not receiving incentive payments from SERP in a timely manner. This was attributed to SERP's not verifying shipment of the SERP units, which is required before Whirlpool can be paid. PNNL was not able to determine where the breakdown in tracking had occurred.

Utilities interviewed said they were frustrated with the lack of information on SERP unit sales in their service territory. In fact, this issue dominated much of the conversation during the interviews. Compounding this problem was the fact that most utilities did not believe they had been successful in

getting SERP administrators to address the issue or provide some assurances that the information would be forthcoming. A number of utilities raised this issue when asked if they would participate in a program of this kind in the future. Some stated that they would definitely not participate without contractual commitments to cover tracking.

Utilities entered into SERP in part because of the benefits of pooling resources and reducing administrative costs associated with planning and managing these programs. It appears, however, that in handing over administrative responsibilities to control administrative costs, some utilities may have handed over more administrative control than they would have liked.

In December 1995, SERP reported that sales of SERP refrigerators were not meeting the sales levels prescribed in the SERP contract with Whirlpool. Whirlpool believes that this shortage relative to forecast is caused by slower-than-anticipated industry growth, administrative problems with SERP such as the previously mentioned zip code changes, administrative problems at the dealer level, and lack of dealer/utility partnering on promotions as originally planned. SERP staff reported that they are currently discussing with Whirlpool ways to get sales back on schedule.

7.8 SERP and Competition

SERP designers paid special attention to how their program could take advantage of competitive forces in the marketplace and, similarly, paid special attention to limiting the unintended competitive impacts of the program. Among the numerous decisions they made in this regard, perhaps the most important was the decision to use a winner-take-all approach.

In choosing the winner-take-all approach, SERP designers sought to take maximum advantage of the competitive forces in the industry. They believed that the larger the winning prize, the harder the competitors would fight to win it; i.e., manufacturers would submit more aggressive bids than in a program with the prize divided among multiple winners. In the words of one SERP designer, "we wanted a program in which a refrigerator manufacturer couldn't afford not to win."

SERP made numerous other decisions that took stock of the program's competitive effects. For example, the decisions that determined the allowable refrigerator styles and sizes that could be bid were very much influenced by SERP's desire to leave, as much as possible, those kinds of decisions to the market. They believed that if they were more restrictive in what manufacturers could bid, they might unknowingly make decisions that were incompatible with the needs of the market. So, assuming that manufacturers knew best what size and styles they could successfully offer in the market, they largely left those decisions to the manufacturers.

SERP followed a similar philosophy with regard to how the SERP models would be marketed. SERP very deliberately chose not to specify how the SERP models would be marketed and advertised. They left those decisions up to the manufacturers, assuming they knew best how to do it.

Judging by the large number of manufacturers that responded to the SERP RFP, SERP achieved its objective of spurring substantial competition among refrigerator manufacturers. But much of this competition occurred prior to announcing the winner of the SERP competition. Whether such competition continued and will continue after announcement of the award is another question. The question is raised because although the refrigerator market is crowded with models offered by many manufacturers, only Whirlpool is licensed to sell refrigerators under the SERP name. Given the very high level of publicity generated by SERP, and the apparent high level of consumer interest generated by this publicity, Whirlpool appears to be in a unique and desirable market position with their SERP refrigerator (Eckert 1995).

This unique market position by Whirlpool may explain a number of comments received during this evaluation that indicate some dissatisfaction with the speed and aggressiveness with which Whirlpool has moved to market the SERP model. If Whirlpool were competing against other manufacturers with the SERP designation, they might be marketing their model more aggressively. However Whirlpool contends that they have gone well beyond their contractual levels of promotional spending.

One could argue that, although only Whirlpool can market the SERP model, its contract with SERP compels it to market the SERP models aggressively because if the units don't sell, Whirlpool doesn't get paid. True, but one must also consider that once SERP announced the award for Whirlpool, it ceased being an arbiter among competitors and it became a business partner with SERP. SERP became dependent upon a sole supplier for the continued success of its program.

In summary, SERP appears to have done an excellent job in taking advantage of competitive forces in designing its program. It appears also to have carefully weighed, at each point of program design and implementation, whether it needed to intrude into the market or let the market and its competitive forces determine the best outcome. But, in choosing the winner-take-all approach, SERP limited its ability to use competitive forces after award of the contract. SERP also faces challenges associated with administering a national program and meeting the individual needs of participating utilities. Only more time will tell whether these issues will create problems in achieving its goals.

7.9 SERP and Proprietary Information

Another issue related to SERP's involvement with the appliance industry should be recognized. SERP decided to offer a program that focused on working with appliance manufacturers rather than local retailers, which had been the focus of traditional utility appliance rebate programs. By choosing to work with appliance manufacturers, SERP ventured into an industry area where companies are very careful not to reveal information that may advantage their competitors. SERP found that it also had to be very careful not to reveal whatever proprietary information manufacturers shared with them, lest it violate the agreements with and lose the confidence of the manufacturers it was working with. Such high levels of concern about proprietary information are much less common in traditional utility rebate programs. In those programs, utilities and their program evaluators enjoy easier access to sales and customer data, which could be obtained directly from local retailers or from forms sent to utilities by consumers applying for rebates.

SERP, however, has proved to be very difficult to evaluate because so much information that would assist an evaluator has been deemed proprietary. For example, PNNL did not have access to manufacturer bids, utility and manufacturer comments on the SERP RFP, SERP sales data, and utility/SERP meetings. As other evaluators begin their own SERP program evaluations, they will likely encounter similar challenges regarding SERP data access and availability.

8.0 References

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Appendixes

Super Efficient Refrigerator Program Participating Utilities

APPENDIX B: SERP Promotional Materials

Features:

- EZ-View System™ helps you find food fast.
- Adjustable SPILL-GUARD™ Shelves and Button-Mount Door Bins make it easy to organize everything.
- ThirstCrusher™ Thru-the-Door Ice and Water Dispenser cuts down on open-door time.
- Advanced energy-saving technology helps your lower utility bills.

How much you save depends on the energy consumption of your previous refrigerator. Still, by comparing the energy label of a SERP™ model to a similar non-SERP model, you will easily see the relative difference.

Models ED22DC and ED22PC

*Where
Can You
Purchase
A SERP™
Refrigerator?*

Super efficient refrigerators are made available to consumers who reside in locations served by SERP™ utility members. The map above shows these locations.

Printed on Recycled Paper

B-2

Questions about SERP[™] refrigerators? Representatives at the Consumer Assistance Center are available to answer questions about Whirlpool appliances, including the SERP[™] refrigerator. The number to call is 1-800-253-1301.

Form No. 3B40

Our Inside Makes For A Better Outside

TWO WAYS TO SAVE YOUR GREEN

B.3

1 KitchenAid super efficient refrigerators exceed 1993 federal energy standards by more than 25 percent. Because refrigerators run 24 hours a day, they are a major household energy drain. With a super

efficient refrigerator, energy consumption drops, which means lower power bills for you—an easy way to save some green.

In addition, **2** KitchenAid SERP™ refrigerators boast a CFC-free sealed compressor

system. That means it won't harm the ozone, which makes everyone breathe a little easier.

An improved condenser fan motor is more energy-efficient than ever before. And super efficient refrigerators reduce the load on existing power plants, reducing the need to build more power plants. Fewer power

plants mean less strain on nature's resources. These new adaptations help save the real green—our environment.

The latest advances and KitchenAid elegance

Even though our SERP™ refrigerators are on the cutting edge, we didn't forget style and elegance. Our remarkable refrigerators use nature as a

blueprint for beautifully designed features.

KitchenAid features total color coordination from the top to the bottom, inside and out.

Adjustable glass shelves and ClearVue™ drawers make organization easier, while an elegantly designed through-the-door ice and water dispenser makes entertaining a snap.

WHAT IS SERP™?

Twenty-four utility companies have joined the Super Efficient Refrigerator Program Inc. (SERP™). The program challenged U.S. appliance manufacturers to produce a super efficient refrigerator. The winning manufacturer—the maker of KitchenAid—will receive incentive payments from SERP™ to be applied toward consumer purchases. SERP™ refrigerators are in the same price range as comparable non-SERP models. Now you won't have to sacrifice style to be environmentally conscious.

- An interior as roomy as all outdoors—22 cubic foot capacity.
- Large items are easy to accommodate with adjustable glass shelves.
- See what's inside at a glance with ClearVue™ drawer fronts.
- Effortless open and close drawers with the RollerTrac Plus™ System.

• Entertaining is easy with a stylish through-the-door ice and chilled water dispenser.

• Environmentally conscious features and attention to detail inside and out.

How much you save depends on the energy consumption of your previous refrigerator. Still, by comparing the energy label of a SERP™ model to a similar non-SERP model, you will easily see the relative difference.

Striving

to

leave

it

the

way

it

was

made

SERPTM

SUPER EFFICIENT
REFRIGERATOR
PROGRAM INC.

Mission Statement

The mission of Super Efficient Refrigerator Program, Inc. (SERPTM) is to advance the technology of super efficient refrigerators/freezers (R/Fs) and bring energy efficient and environmentally friendly R/Fs to consumers years ahead of normal market expectations. SERPTM will provide incentives to that manufacturer who won a competitively bid contract to develop and distribute between 1994-

1997, over 250,000 R/Fs that are at least 25% more energy efficient than 1993 federal standards mandate. Whirlpool Corporation, the winning manufacturer, will produce R/Fs which will be chlorofluorocarbon free (CFC-free). SERPTM is a unique private/public coalition to create and to govern the incentive process which is also focused on pollution prevention and enhancement of overall environmental quality.

SERP's Objectives:

- To utilize existing market forces and provide incentives to manufacturers to design, develop, and distribute super efficient R/Fs during the years 1994 to 1997. This program will put super efficient R/Fs on the market years ahead of what would happen in the absence of the program.
- To ensure that any refrigerator distributed under the program meets high standards for energy efficiency, pollution control, and consumer satisfaction.
- To ensure that refrigerators developed under the program have adequate market appeal to ensure purchase by consumers.
- SERPTM will ensure accountability in the program, so that utility members can appropriately document relevant costs, kWh savings and efficiency. Such accountability will be an inherent part of the SERPTM program.

SERP™

SUPER EFFICIENT
REFRIGERATOR
PROGRAM INC.

What is SERP™?

Super Efficient Refrigerator Program, Inc. (SERP™) is a non-profit corporation formed by twenty-four public and private utilities throughout the United States who have invested over \$30 million in the program. The mission of SERP™ is to advance the technology of super efficient refrigerator/freezers (R/Fs) and bring energy efficient and environmentally friendly R/Fs to consumers years ahead of normal market expectations. SERP™ will provide incentives to the winning manufacturer that won a competitively bid contract to design, develop and distribute, between 1994-1997,

over 250,000 R/Fs that are at least 25% more efficient than the 1993 federal standards. Whirlpool Corporation will bring to market SERP™ R/Fs which will be chlorofluorocarbon (CFC)-free. SERP™ is the first market driven program to bring an entirely new generation of highly energy efficient CFC-free R/Fs to the marketplace. SERP™ is endorsed by the Consortium for Energy Efficiency, Inc., which shares and supports the same vision to accelerate developments and availability to the public of advanced technologies that promote energy efficiency and pollution prevention.

Why SERP™?

Since the first Energy Act in the mid-1970s, federal and state energy policy-makers and regulators have encouraged utilities to develop innovative programs to promote energy efficiency as an alternative to new power generation facilities. Energy savings through efficiency is the least expensive, cleanest, and most reliable source of energy. SERP™ is the first to combine the Demand Side Management objectives of member utilities. As such, SERP™ is the first market driven program to bring highly efficient CFC-free R/Fs to the marketplace.

In addition, existing and emerging technologies make it possible to design refrigerators that are both super-efficient and CFC-free. Manufacturers are now work-

ing to meet the challenge of phasing out CFCs as mandated under the 1990 Clean Air Act Amendments. This will require new technologies and capital investments. However, unless they are financially and market motivated, manufacturers are unlikely to use this technological window of opportunity to simultaneously make large leaps forward in efficiency.

By engaging utilities to commit to market-motivating, efficiency incentives now, SERP™ can bring highly efficient, CFC-free R/Fs into the market in the mid-1990s. SERP™'s forward-thinking approach and unique program design, helps participating utilities maximize the economic and environmental benefits of their residential energy efficiency investments.

How Does SERP™ Work?

Utilities from across the nation committed over \$30 million to enable SERP™ to offer a winner-take-all bid pool to the R/F manufacturers. SERP™ program encouraged manufacturers to compete through a Request-for-Proposals (RFP) process for the bid pool. Based on this RFP, SERP™ received a number of proposals from manufacturers which, after evaluation, resulted in the selection of Whirlpool Corporation as the winner of the incentive contract. Whirlpool developed a super efficient CFC-free prototype (proof-of-concept) for SERP™'s evaluation. Whirlpool's proposal was judged on cost-effectiveness, performance of the prototype

model and its best and final offer. SERP™ awarded the contract to Whirlpool on June 29, 1993. SERP™ will pay Whirlpool on a per unit basis as R/Fs are delivered into the participating SERP™ utility areas. SERP™ is planning to work with participating utilities to increase customer awareness, and assist the manufacturer in marketing the SERP™ qualified units. SERP™ will also track the distribution and sales to consumers. The tracking and distribution data will be used to compile reports regarding energy savings, market penetration and program evaluation.

What is Super Efficient?

The super efficient R/F will use combinations of available and emerging advanced technologies such as super efficient compressors, better gasket and sealing systems, smarter control systems, and improved insulation systems. By using a combination of these or other components, manufacturers will be able to increase energy efficiency of

R/Fs while meeting the CFC-free requirement. The super efficient R/F will use 250-450 kWh per year less than the similar 1993 comparable model R/F. The super efficient R/F will be moderately priced and will have adequate market appeal to ensure purchase by consumers.

Benefits

Successful implementation of the SERP™ program will benefit member utilities by securing least-cost energy savings.

The consumer will benefit because the super efficient R/F will be priced comparably to similarly sized units and will save the consumer from \$400-\$600 in electric bills over the life of the R/F.

The introduction of super efficient CFC-free R/Fs

will benefit the environment because it would cut annual carbon dioxide emission from power plants by an estimated 600,000 metric tons, saving \$270 - \$540 million in carbon cleanup costs over the life of the program.

The nation benefits because no tax dollars are being used to achieve this high standard of efficiency.

Endorsements

The following organizations have endorsed, supported, or advised SERP™:

- American Council for an Energy Efficient Economy
- California Manufacturers Association
- Consortium for Energy Efficiency, Inc.
- Electric Power Research Institute
- National Association of Regulatory Utility Commissioners
- Natural Resources Defense Council
- U.S. Environmental Protection Agency
- U.S. Department of Energy
- Washington State Energy Office
- Wisconsin Center for Demand Side Research

Membership

The following utilities have joined and are active members of SERP™. For information regarding member utilities, please contact the person listed below:

MEMBER	REPRESENTATIVE	TELEPHONE NO.	INVESTMENT
Atlantic City Electric Company	Paul Liepe, Director	(609) 645-4460	\$500,000
Arizona Public Service Company	Bill Pascarella	(602) 250-2402	\$250,000
Bonneville Power Administration	Debra Byers, Director	(503) 230-4597	\$2,100,000
Baltimore Gas & Electric Company	Al Galindo, Director	(410) 265-4118	\$1,425,080
Central Maine Power	Marjorie Force	(207) 623-3521	\$301,500
Commonwealth Electric Company and Cambridge Electric Light	Elizabeth Farrell	(508) 291-0950	\$500,000
Jersey Central Power & Light	Frank Migneco	(201) 455-8385	\$969,440
Long Island Lighting Company	Elias Stergakos, Director Vice Chairman	(516) 364-7852	\$1,944,000
Los Angeles Department of Water and Power	Ned Bassin, Director	(213) 482-0083	\$2,000,000
Madison Gas & Electric Company	Lynn Hobbie	(608) 652-4760	\$135,000
New England Electric System	Meredith Miller, Director	(508) 366-9011	\$1,500,000
Northern California Power Agency	Michael Mace	(916) 781-4222	\$128,444
Northern States Power Co. Wisconsin	Linda Zeits, Director	(715) 839-4694	\$185,000
Northern States Power Co. Minnesota	Barbara Delaney	(612) 330-6858	\$400,000
Pacific Gas & Electric Company	Paul Brodie, Director Chief Financial Officer	(415) 973-2212	\$6,600,000
PacifiCorp	Scott Robinson, Director	(503) 464-6523	\$1,000,000
Public Service Electric & Gas Co.	Asha Makam	(201) 430-6419	\$3,000,000
Sacramento Municipal Utility District	Janis Erickson, Director Secretary	(916) 732-5438	\$750,000
Southern California Edison Company	Ray Farhang, Chairman Chief Executive Officer	(909) 394-8828	\$5,850,000
Superior Water, Light & Power Co.	William Fenessey	(715) 394-2200	\$13,600
Western Massachusetts Electric Co.	Paul Kuehn	(203) 665-2747	\$317,822
Wisconsin Electric Power Company	Lisa Fox	(414) 221-3889	\$200,000
Wisconsin Power & Light Company	Melinda Ferraro	(608) 252-3243	\$285,767
Wisconsin Public Service Corporation	Leslie Moss	(414) 433-1725	\$347,368

Contacts

For information concerning SERP™, please contact:

- Mr. Ray Farhang
Chairman of the Board and
Chief Executive Officer
c/o Southern California Edison
300 N. Lone Hill Ave.
San Dimas, CA 91773
(909) 394-8828
- Mr. Paul Brodie
Chief Financial Officer
c/o Pacific Gas & Electric Company
444 Market Street, Suite 1643
San Francisco, CA 94106
(415) 973-2212

APPENDIX C: SERP Label

APPENDIX E: Dealer Training Materials

WHIRLPOOL®/KITCHENAID®

Super Efficient
Refrigerators

Our

Inside

Helps

Make

for a

Better

Outside

1994 SALES TRAINING

Our

Inside

Helps

Make

for a

Better

Outside

WHAT IS SERP?

The Super Efficient Refrigerator Program. A way to help preserve our environment, save energy and save money. Brought to consumers by members of SERP, Whirlpool Corporation and SERP dealers.

Think about it. Operating 24-hours a day, the refrigerator is a major user of energy. So it's only natural that energy efficiency begins at home...with a Super Efficient Refrigerator.

That's why a group of 24 utility companies formed the Super Efficient Refrigerator Program. The program challenged US appliance manufacturers to design and build a Super Efficient Refrigerator. The winner would receive \$30 million over the course of four years. By consuming less energy, these refrigerators would help reduce the load on existing utility plants. In turn, the need to build more power plants would be reduced - which is why utilities are so supportive of appliance industry efforts to build and sell energy-efficient refrigerators.

SERP is a non-profit organization formed by 24 public and private utilities to bring energy-efficient, environmentally conscious refrigerators to consumers.

Creating Substantial Savings

Improving energy efficiency has been a top priority for appliance manufacturers. In 1972, the average cost to operate a 22 cubic foot side-by-side refrigerator ran \$210. By 1993 that amount dropped to \$70.

The cost of electricity has nearly doubled since 1972, a fact that adds even more impact to the energy savings story of Super Efficient Refrigerators.

The amount of energy and money that a consumer will save with a Super Efficient Refrigerator depends on the energy consumption of the refrigerator that the consumer previously owned. However, consumers can easily compare the energy label attached to a SERP refrigerator with a like model of a non-SERP refrigerator.

And the Winner is....

The SERP contest was announced in July 1992 and attracted 14 manufacturers. Whirlpool was named one of two finalists in December. Bids and prototypes from the finalists were judged on a 100-point system which concentrated on energy efficiency improvements; the ability to deliver the products to market; and the ability to track consumer purchases. SERP required the winner to develop and distribute refrigerators at least 25

percent more energy-efficient than 1993

federal standards.

On June 29, 1993,

the announce-

ment was

made that

Whirlpool

Corporation

clearly demonstrated

the state-of-the-art technology and proposal that won SERP's contract.

Of course, the real winner in the SERP Program is the consumer.

Consumers will now be able to enjoy lower utility bills and the satisfaction that comes from knowing they've chosen a product that's environmentally conscious. Plus consumers can use the savings to offset the cost of the refrigerator. Whirlpool initially

Whirlpool Corporation

accepted the SERP challenge because

it was consistent with Whirlpool's

strategy to exceed customer

expectations. For example,

two-thirds of the 1993

Whirlpool Corporation's models

exceed the stringent federally-

mandated energy efficiency

standards by 10 to 20 percent!

Whirlpool estimated

spending nearly

\$200 million in

the last five years

to improve the

efficiency of its refrigerators and

to work toward eliminating ozone-

depleting CFCs. That's just what you

would expect from the world's largest

manufacturer of home appliances.

When it comes to quality, product

satisfaction and service, Whirlpool

beats the competition cold. Whirlpool

is dedicated to bringing SERP

refrigerators to its customers; in fact,

Whirlpool is driven by one of its basic

values: to create innovative and

superior products.

Making the connection...

Whirlpool wants to

connect with

consumers so its

brands give

compelling reasons

beyond price to buy products. To

make this happen, Whirlpool positions

each of its brands to specific market

segments.

Introducing SERP Refrigerators

SERP refrigerators look like other comparable 22 cubic foot side-by-sides produced by Whirlpool Corporation and offer the same quality, performance and convenience. Besides a thicker door (1 1/4 inch), there are almost no visible differences. SERP refrigerators stand out because of the technology that determines how the refrigerators operate.

*KitchenAid Super Efficient Refrigerator
Model KSPS22QB • Model KSPB22QB*

- 22 Cubic Foot Capacity
- Total color coordination from top to bottom, inside and out.
- Adjustable glass shelves accommodate all your food items...from small to tall.
- ClearVue™ drawer fronts let you see what's inside the crispers. And the RollerTrac™ Plus System enables drawers to roll open and close effortlessly.
- Slide 'N Lock™ Door Bins adjust up and down to accommodate milk jugs, 3-Liter softdrink bottles and other large items.
- An elegantly designed through-the-door dispenser puts crushed ice and chilled water within easy reach.

SERP refrigerators meet SERP's requirement to be at least 25 percent more energy-efficient than the 1993 federal standards. And they are environmentally-conscious with a CFC-free sealed refrigeration system. Additional energy efficiency improvements include better insulation, a high-efficiency compressor and an improved condenser fan motor. The fan motor works in conjunction with Whirlpool's adaptive defrost control that uses a microchip to record and adjust the length and frequency of the defrost cycle.

*Whirlpool Super Efficient Refrigerators
Model ED22DC • Model ED22PC*

- 22 Cubic Foot Capacity
- EZVue™ Design helps you find food fast.
- Adjustable SPILLGUARD™ Shelves make it easy to organize everything. Plus they contain spills!
- Button-Mount Door Bins adjust to hold whatever you want to store.
- ThirstCrusher™ Thru-the-Door Ice and Water Dispenser makes it quick and easy to quench a thirst.
- Upfront Temperature Controls mean no more fumbling in the back of the refrigerator.

Substantial Savings

How much your customers save depends on the energy consumption of their previous refrigerator. Still, by comparing the energy label of a SERP model to a similar non-SERP model, they'll easily see the relative difference.

Here are the strategies which Whirlpool Corporation has established for Whirlpool and KitchenAid...brands that will market the SERP refrigerators.

Whirlpool knows your life is busy and time-pressured, so our refrigerators are designed to help you save time and effort by making items easy to locate and convenient to reach...no matter who opens the door.
"HOW TO MAKE A HOME RUN™"

KitchenAid refrigerators have everything you would expect from a superior appliance, plus the distinct style and thoughtful design details which contribute to the overall look and your enjoyment of your home.
"FOR THE WAY IT'S MADE™"

SERP refrigerators boost Whirlpool Corporation's brand strategies by giving consumers additional reasons to purchase: save money, save energy and help protect the environment.

Delivered to your door

The SERP refrigerator will have limited distribution and will be available only in those areas served by the 24 utilities that participated in the program. The SERP refrigerator will be introduced in the first quarter of 1994. There are no plans at this time to market the SERP refrigerators outside the areas served by the participating utilities; however, dealers aren't penalized for selling to a non-SERP customer.

SERP dealers will enjoy all the advantages of Whirlpool Quality ExpressSM distribution. Quality Express is an industry leader in product delivery, which means more satisfied customers. Dealers enjoy reduced costs and increased profitability with fast, timely delivery.

Below is a list of questions and answers that might prove helpful. If you have additional questions, call the Whirlpool Customer Assistance Center at 1-800-253-1301 (Whirlpool) or 1-800-422-1230 (KitchenAid).

- Q** How will Whirlpool use the \$30 million dollars awarded by SERP?
- A** To ensure that consumers will find SERP refrigerator prices similar to those of comparable non-SERP models by underwriting design, development and marketing costs, as well as increased cost of materials and parts. Note that the money is not awarded in one lump sum; rather it's dispersed over the sales period of Super Efficient Refrigerators.
- Q** How will consumers benefit from the purchase of a SERP product?
- A** Consumers will have lower utility bills because the energy-efficient SERP refrigerators cost less to operate. Collectively, the smaller electric bills mean less need for power generation and therefore less air pollution from power generation plants. Also, the sealed refrigeration system in the SERP product doesn't deplete the ozone...and that benefits all of us.
- Q** How much money has Whirlpool invested in the SERP program?
- A** It's difficult to estimate what the exact costs are for this program because Whirlpool has been developing energy-efficient products for 20 years and more recently, working to redevelop products to be CFC-free. To stay on top in the technology area, Whirlpool has invested at least \$200 million in the last five years on these two efforts alone.
- Q** Will parts be more difficult to obtain and will service for the new SERP refrigerators cost more?
- A** A great deal of testing and analysis has been done to assure the reliability of the SERP refrigerators which must meet the same high standards as those for the remainder of the Whirlpool model line. Service parts and procedures are in place.
- Q** Where can consumers have questions about SERP refrigerators answered?
- A** Representatives at the Whirlpool Consumer Assistance Center can answer questions about Whirlpool-built appliances, including the SERP refrigerator. For Whirlpool brands, the number to call is 1-800-253-1301; for KitchenAid brands, the number is 1-800-422-1230.