

THE BEST LAID PLANS OF MICE AND MEN:
A PROCESS EVALUATION OF THE HOOD RIVER CONSERVATION PROJECT

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ABSTRACT

The Hood River Conservation Project weatherized almost 3000 homes in two years. This feat was accomplished in addition to the installation of high-level measures and simultaneous implementation of a research project, all in a small rural community.

It is evident that this program was unlike any other in the intensity of its demands. Though extensive planning took place before the Project began, implementors were often forced by unanticipated occurrences to change rapidly to adapt to new situations. This process evaluation discusses some of the changes encountered and lessons learned in the course of Project implementation.

Topics include: background and structure of the project, field office set-up, staffing structure, weatherization implementation, contractor relations, inter-organizational and evaluation issues.

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INTRODUCTION

The Hood River Conservation Project will be remembered by many for its notable levels of participation and weatherization, and for the quality data and analysis which emerged in this applied research experiment.

An achievement perhaps less noted, but equally important, is the development of a paradigm of community specific Project implementation within a cooperative context.

This project, with a weatherization budget of approximately \$13 million, is the first of its kind, endeavoring to fully weatherize 3100 electrically heated homes in Hood River, Oregon within a 24 month time period. In addition, over \$7 million was allocated for evaluation research and metering equipment (Engels et al., 1986).

In order to attain its goals, the Hood River Project challenged several accepted modes of "doing business". Organizations set aside differing perspectives in favor of a common goal, bureaucracies created new structures to adapt to special Project needs, and field personnel implemented innovative procedures to attain optimal production levels. These changes were the result of a combination of careful planning and on the job problem solving. The implementation of the Project is discussed in terms of adaptive change and lessons learned in four areas: organizational structure, the weatherization process, field office procedures and evaluation issues.

Project Description

The Hood River Conservation Project (the Project) is a weatherization research effort sponsored by several energy related organizations, funded by the Bonneville Power Administration, and administered by Pacific Power & Light Company. It seeks to quantify the value of conservation as a resource for use in regional power planning under the Northwest Power Planning and Conservation Act of 1980. This legislation mandated that conservation be utilized as the Pacific Northwest's first choice electric resource in developing an energy plan for the next several decades.

In 1982, the region's utilities and planners held widely divergent views as to the real potential of conservation. The Project was developed as a mutual fact-finding mission whereby all organizations concerned would take

part in the planning and oversight of a weatherization/research project which would provide data necessary to mold an energy plan. The seven organizations involved in developing the Project were the Natural Resources Defense Council, the Bonneville Power Administration (Bonneville), Hood River Electric Cooperative (HREC), the Northwest Power Planning Council, the Pacific Northwest Utilities Conference Committee, the Northwest Public Power Association and Pacific Power & Light Company (Pacific).

The Hood River Project, one of the nation's largest conservation research programs, was designed to test the potential of conservation as an energy resource if it were applied under optimum conditions. High levels of weatherization (i.e., R-49 ceiling, R-38 floor, triple glazed windows, etc.) were offered free to all electrically heated households in the area surrounding Hood River, Oregon, at a cost-effective limit of \$1.15 per kilowatt hour estimated to be saved during the first year.

Evaluation Data

Data for this evaluation were obtained from a variety of sources. A sociologist hired by the Project collected longitudinal field notes from three groups involved in the Project. These groups consisted of members of the community, field and corporate staff, and weatherization contractors. In-depth interviews regarding Project implementation were also conducted with Project staff by an independent consultant at the end of the field period. Finally, members of the evaluation team involved peripherally with Project implementation have amassed both field notes and independent on-site observations in the course of the Project.

The purpose of the interviews conducted by the Project sociologist was to uncover any potential problems in the community, staff or contractor groups early enough that they could be effectively dealt with during the Project implementation. It was a form of self-monitoring put in place by Project management. Due to the trouble-shooting nature of this role, these field notes tend to emphasize personally frustrating or potentially negative aspects of the Project as perceived by those interviewed at the time.

The interviews conducted at the Project's end with Pacific and Bonneville employees involved in the planning and implementation of the field effort tend to emphasize the positive aspects of the Project implementation. Within the months preceding the interviews a well attended closing ceremony deemed the Project a success and many staff involved with the Project had been promoted to new positions in recognition of their work. Conflicts which had arisen between parties during the planning and implementation phases of the Project were brushed aside in an environment of reconciliation and mutual recognition. By the end of the Project, all concerned had increased their ability to view the project implementation from a distant, more objective perspective. This element of 20/20 hindsight facilitated constructive criticism of some aspects of the Project.

Finally, members of the evaluation team had roles which allowed for varying levels of objectivity in the course of Project implementation. There was often crossover between the roles of the Project field staff and evaluators which facilitated candid interaction and mutuality of purpose.

This plurality of perspectives has contributed to multiple levels of evaluation within a single Project. This paper will discuss some of the evaluation issues involved in a large scale, multi-organizational Project.

ORGANIZATIONAL STRUCTURE

Regional Advisory Group

The Hood River Conservation Project does not fit the mold of most traditional weatherization programs. It was conceived and planned by a number of groups, many with divergent perspectives and each with a vested interest in the outcome.

One of the Project's major goals has been to foster agreement in an area of long-standing controversy. Project results will be useful to energy planners only if they are deemed valid by all factions concerned. In order to maintain each group's commitment to the Project results, a model of cooperation, consensus and information sharing was used to create the Regional Advisory Group (RAG). This body advised the Project on a regular basis throughout its planning and implementation phases (Peach et al., 1984,1986).

Administrative Structure

The Project's organizational structure involved several entities, each with varying degrees of implicit and explicit authority. The Bonneville Power Administration funded the effort through a contract with Pacific Power & Light Company who was responsible for Project administration, and the Regional Advisory Group held implicit authority in the overall direction of Project design and management. In addition, a Community Advisory Committee made up of local citizens was established in Hood River to advise field managers as to community sentiment, and to serve as liaison between the Project and the community. In essence, this required Project managers to be accountable to internal management at Pacific in addition to the contractual requirements of Bonneville as well as the concerns of the Regional Advisory Group and Community Advisory Committee. (See Figure 1).

Creating Inter-Organizational Structure

Much of the structural groundwork for effective inter-organizational planning and action had to be laid as the Project progressed. Such start-up tasks as weatherization specifications, initial staffing, scheduling, and contract negotiation frequently required action by both Pacific and

Bonneville. Project work in these areas was initially handled as routine work within these organizations until it was discovered that the pace considered normal for most long-term weatherization programs was fatal to the implementation of a short term Project. Turnaround times of two weeks to one month were not unusual in either organization for each of the many steps required before weatherization could commence.

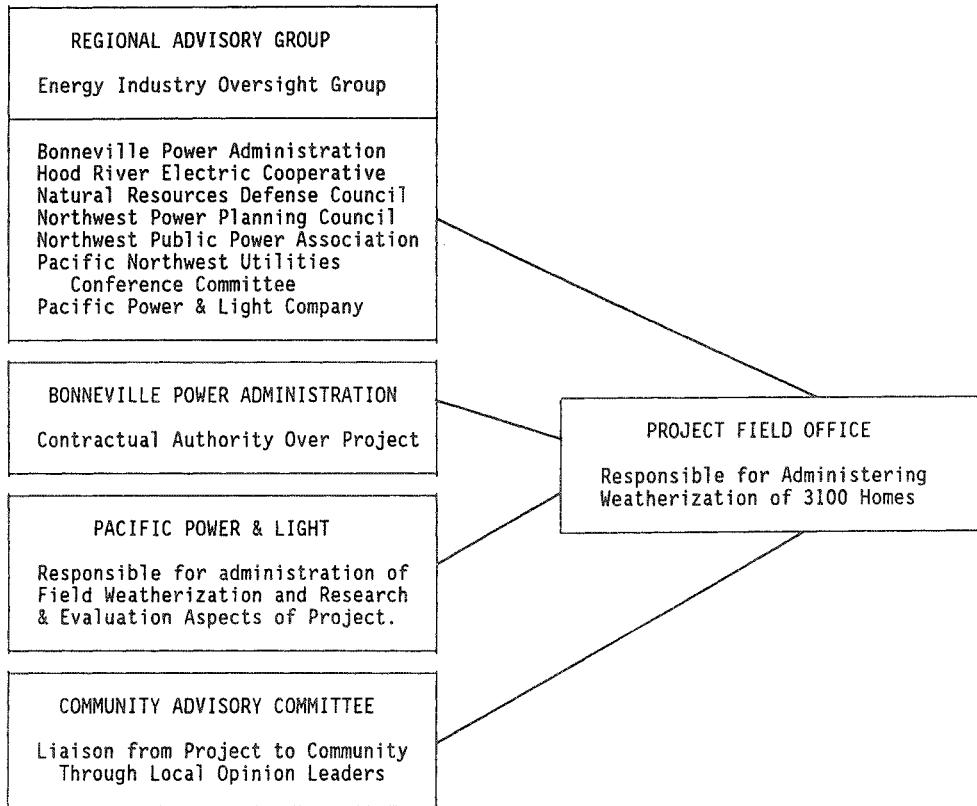


Figure 1. Project Organizational Structure

By the time one third of the 24 month weatherization period had passed, specifications for stick-built homes lacked field interpretation while those for mobile homes were incomplete, staffing was inadequate, the computer system was not live, and no homes had been weatherized. The Project's start up period had lasted far too long for its initial schedule to be achieved. This was the result of two large organizations acting and interacting at their normal pace rather than the fault of any one party. At this point, Project management acknowledged that project goals would have to be compromised, or the timeline extended. In April of 1984, the 24 month period was redefined to denote the period during which actual weatherization occurred. The period began on January 1, 1984 and was set to end on December 31, 1985.

The inter-organizational delays leading to the contract extension could have easily increased conflict among these groups. Instead, as Project staff

in the field and at both Pacific and Bonneville identified their work more closely with Project goals, they increased efforts to work and communicate effectively. The desire for organizational pride reinforced the interdependence of the organizations' goal of Project success. Staff at both Pacific and Bonneville adapted to a new form of communication and cooperation whereby organizational lines began to fade as Project lines took shape. In a way, this start-up time was necessary to develop a working structure which would make the Project a success.

Due to internal constraints, project personnel at Bonneville and Pacific were sometimes unable to instigate changes necessary for Project success. Fortunately, an open dialogue existed between top executives at both organizations which allowed for rapid exchange of information and greater flexibility in initiating change from the top down. Commitment to Project success from high levels of management within both Pacific and Bonneville facilitated short-cuts through the bureaucracy which reduced the frequency and duration of production bottlenecks.

WEATHERIZATION PROCESS

The Project weatherization process included many steps from the initial customer contact and marketing questionnaire through the audit, contractor bid, cost-effective calculation, installation of weatherization measures and finally to inspection of work completed and contractor payment. (See Figure 2).

Office Recordkeeping

A sophisticated computer data base was designed to accommodate the large amounts of information and automated reports needed for project management and a thorough evaluation. In addition, each house signed up for the Project had its own "packet" - a manila folder containing up to 30 different forms which contained data on existing levels of weatherization, appliances and household demographics in addition to all records associated with the actual weatherization of the home. Together these record systems provided the extensive data base needed for the research.

Contractor Problems

One of the Project's aims was to assess the capability of communities to participate in large scale weatherization. For this reason, a commitment was made to hire locals whenever possible. An outside firm which hired some local help was contracted to perform energy audits, and weatherization contractors were hired from the local community. The initial criteria for contractor selection required previous experience with either Pacific, Bonneville or HREC weatherization programs, and a business which had been established in Hood River by April of 1983 (prior to the onset of the Project).

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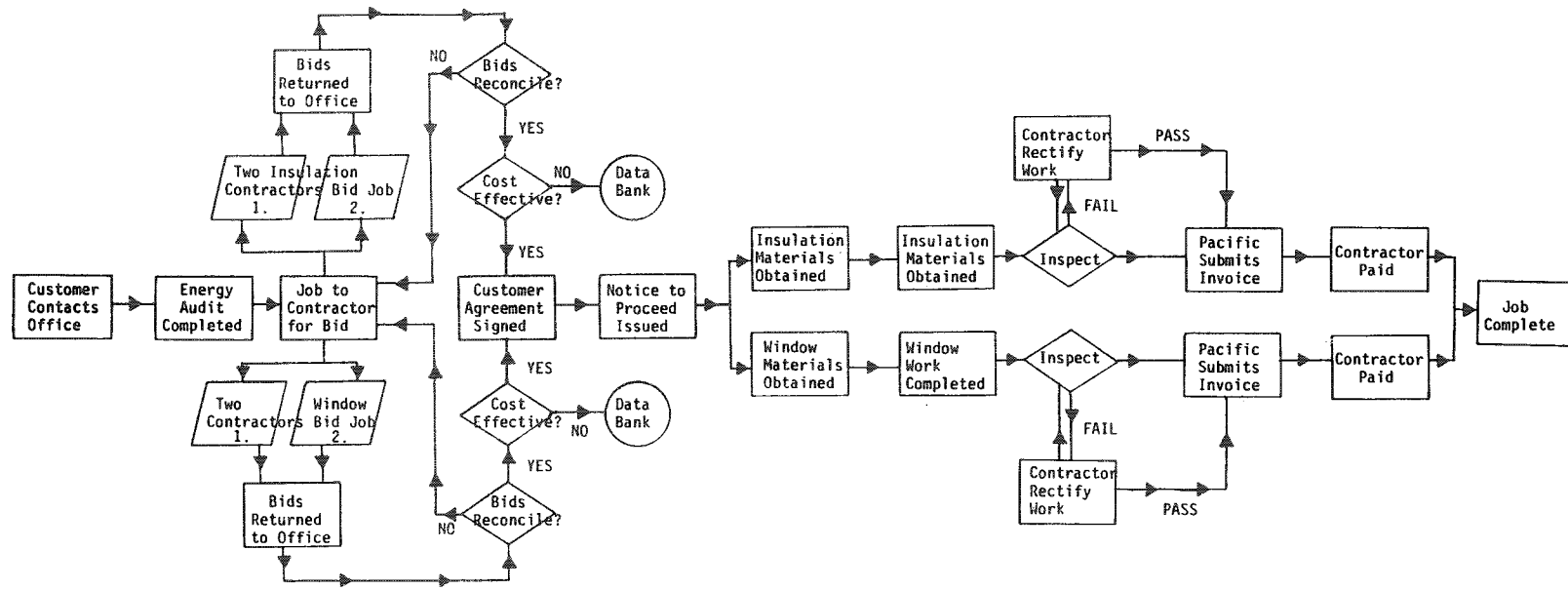


Figure 2. Flow chart of the field weatherization process and bid system as they were envisioned at the Project's beginning.

Five local contractors met these criteria for the "first round" of hiring and signed contracts with the Project in late 1983. Project staff began orientation meetings with the contractors in the fall of 1983.

The initial intent of both Bonneville and Pacific had been to establish a unit price system to be used throughout the Project. Contractors submitted bids from which the unit price schedule was to be developed. The resulting price list was rejected by Bonneville because the costs were up to 100% higher than most existing Bonneville weatherization programs in the region. Project management assumed that contractors were likely apprehensive about potential installation problems and increased administrative burdens and were covering themselves with bids that were initially high. It was decided to institute a 90-day trial period during which contractors would bid competitively for weatherization jobs. Management hoped that once contractors had passed the initial learning curve, prices would be reduced, and a unit price schedule could be effectively incorporated.

The early stages of weatherization were plagued with set-backs. Many times, two contractors would submit bids for different weatherization measures on the same house, and field specialists had to reconcile bids before awarding the job. This sometimes occurred when a homeowner would show different things to the two contractors. This problem was compounded when discrepancies existed between both bids and the initial project audit. Due to the Project's research nature, the bid system, and federal regulations associated with the Bonneville contract, substantial recordkeeping was required of the contractors. In addition, the high levels of insulation and glass being installed in homes required methods of installation which were often new to the contractor.

Weekly contractor meetings were held with Project staff to insure uniform and up to date distribution of information. Innovative methods of installation were discussed at meetings in addition to interpretations of specifications. The latter were raised by the contractors who encountered them while installing measures and had to be clarified by Contract personnel at Bonneville. In some cases, a need for specification interpretation could hold up a job for weeks, slowing down production and upsetting the contractor's cash flow.

By the end of April 1984, 36 homes had been weatherized in contrast to a goal of 160. The bid system had not substantially lowered prices over time as hoped and was becoming increasingly cumbersome for the office staff to process. By this time, several local contractors who had not fit the initial criteria for Project participation began to express interest in the Project. They argued that the Project was saturating the market for weatherization in the area, and that their businesses would suffer in the future while they received no short term gain. In addition, the Bonneville contract encouraged competition and hiring of small businesses whenever possible.

During this phase, the office began to receive complaints about the quality of work of two of the initial five contractors. As complaints

mounted, project staff debated as to which would have the greater negative community impact - firing two local contractors, or allowing them to continue poor quality work. The Community Advisory Committee and members of the field staff who had customer contact advised managers to remove the two contractors from the Project. After establishment of quality control measurements and documentation of any violations, the two contractors were removed from the Project.

During this time, six local second round contractors were admitted to the Project, and two outside firms took over the work of the removed contractors. A unit price system was established, and out of town contractors were contacted in case the nine local contractors refused to lower their costs.

The Hood River contractors accepted the unit price schedule, and rates of completion began to increase due to the larger number of contractors working on the Project. By this time many of the Project contractors had hired subcontractors, many of whom were from out of town. There were now nine contractors creating a larger pool of completed homes per week, but there were still only two Project weatherization inspectors.

As Pacific Power would be financially liable for weatherization costs of any homes not passing a post-Project Bonneville audit, inspections were stringent. Contractors were not paid for work completed until it had passed inspection. As production increased, the project inspectors were not able to keep up with the backlog of jobs. This strained the contractors' cash flow, which threatened to slow production. This cycle was broken by the addition of four inspectors and a special Project policy of advancing payment to contractors if a job had not been inspected within 30 days of completion.

In order to reduce the number of reinspections, a fine system was instituted. If a job failed the initial inspection, the contractor would be fined \$50 per week until the job passed. A distinction was made between a major failure and a minor failure. Minor failures included such items as a missing screw on a window or lack of door weatherstripping. A "speedy memo" form was used for minor failures whereby the contractor was notified of the error and instructed to fix it. Payment was not withheld for minor problems.

Once the issues of unit price, contractor selection and inspection pace and criteria had been resolved, field staff and contractors were able to focus on attaining the weatherization goal of 3100 homes by December 1985.

After extensive modifications and several months of pragmatic application, the computer system had become an effective management tool, and was able to provide the field administrator with several useful status reports. The initial format of these reports tagged jobs which were overdue, at which point the contractor was notified. Over time, the process emerged and reports were generated which measured progress at every stage of the weatherization process. This allowed for lists of homes which had

received an audit and were waiting for a bid, homes with bids waiting for a customer agreement, homes in the process of weatherization, etc.

Project staff decided that the sharing of these reports with contractors would serve two purposes. The contractors would be able to more accurately manage their own businesses, thereby becoming more productive, while the Project would be notified of any discrepancies in recordkeeping. This decision exemplifies the spirit of cooperation which existed between field staff and contractors.

FIELD OFFICE OPERATIONS

The success of the Project depended heavily upon the ability of field office staff to create a well coordinated unit which would be able to deal efficiently with the tremendous volume and variety of work which the Project entailed.

Field Office Structure

The initial structure of the Project staff within Pacific Power included the Project manager for PP&L and a Research & Evaluation team in the Portland corporate office in addition to the field staff located in Hood River. The initial field staff consisted of two managers, one for administration, marketing and community relations, the other in charge of the weatherization effort. Authority for expenditures and office decisions rested with the Project manager in Portland.

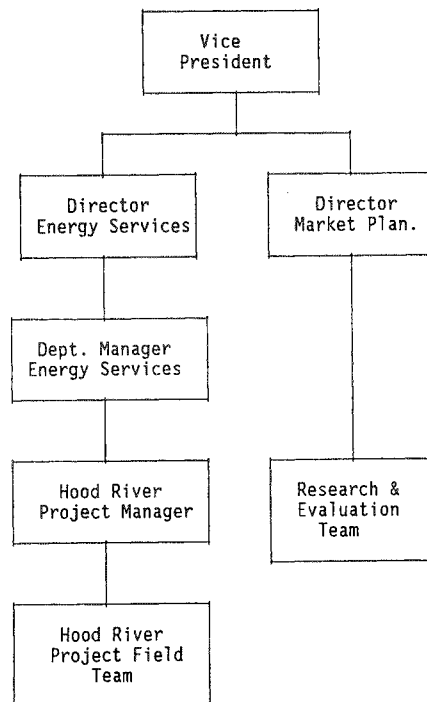


Figure 3. Staff Structure

This structure worked well during the initial months of the Project when a major goal was gaining entry into the community and marketing the Project. By June of 1984, however, 2100 electrically heated households had signed up for the project, greatly reducing the need for continued marketing efforts. The field office emphasis shifted to the weatherization of homes and the extensive administrative work which accompanied the weatherization effort.

The marketing manager was replaced by a field administrator who had extensive experience with Pacific's zero-interest loan program, and greater authority was shifted to this position in the field office. The weatherization manager reported to the field administrator, creating a more effective line of command. (See Figure 3).

Project Staffing

Although funding for the Project was provided by Bonneville, staffing and other field expenses were subject to the policies and restrictions which existed within Pacific Power. The Project began during a time of companywide reduction in personnel. As a result, both those hired from outside and Pacific staff transferred to the Project were put on a Project status. Though this was not beneficial to the employee, it reduced the amount of internal justification traditionally associated with adding permanent staff. In the long run, this allowed the Project field manager to coordinate staffing levels with rapidly fluctuating production demands.

Initially, however, requests for additional staff in the field were subject to standard company evaluation. This was not effective in rapidly solving Project bottlenecks in the early phases of weatherization. By September of 1984, after one third of the revised contract period had passed, only 268 homes had been completely weatherized. This represented 9% of the Project goal of 3100 homes and 11% of the 2342 of electrically heated households registered with the Project to date. One of the bottlenecks identified by field managers was a shortage of inspectors. With a more rapid staffing approval process in place, four inspectors were hired and trained in a period of three months.

The rate of weatherization completion reached its highest efficiency during mid-1985. By this time, almost all specification interpretations had been clarified by Bonneville, mobile home and air-to-air heat exchanger specifications had been completed, staffing was adequate, seasoned contractors familiar with the work, and a unit price system was in place.

The field administrator promoted a sense of teamwork among members of the field staff. In order to adequately perform all aspects of Project work and avoid bottlenecks, diversification of skills and flexible job definitions were encouraged. This allowed inspectors, data entry personnel and even the field administrator and weatherization manager to meet with customers as field specialists during high volume periods. In addition, some field specialists were trained as inspectors and had working knowledge of the computer data base.

EVALUATION ISSUES

Regional Advisory Group

In order to establish and maintain the validity of the evaluation, the Regional Advisory Group was incorporated into research and evaluation efforts to review data, analytical methods, and preview initial results. In the long run, the involvement of RAG members in the evaluation effort increased its validity within the organizations they represented. The high level of trust and information sharing also increased the effectiveness and cohesiveness of the RAG.

Creation of a group such as this is strongly recommended to evaluators addressing issues which are deemed controversial within a particular field. Such a diversity of perspective and background will greatly improve the quality of evaluation planning, the widespread acceptance of its results, and provide useful expertise.

Organizational Structure

Early communication with program staff by evaluators increases both parties' understanding of the Project as a whole. This reconciles the program with the evaluation activity and increases mutual understanding of both staffs' needs, and cooperation in attaining those ends.

The evaluation team working on the Hood River Conservation Project was placed in the fortunate structural position of separate but equal to the program staff. Integrity of the evaluation was maximized by the existence of an independent reporting and financial structure. While these groups were for the most part independent of each other, allowing the freedom necessary for effective evaluation work, there was an implicit commitment to active cooperation between the two groups when it was necessary for program success.

Many details of any program implementation could well have been missed by evaluators who start work at a program's end or who lack proximity to the program effort. The Hood River evaluation team did, on occasion, spend time contributing to program efforts. This activity helped frame evaluators as being "in on the program effort" while allowing them to pick up informal program information. Longitudinal exposure to the program was carefully balanced with a commitment to objectivity on the part of evaluation staff.

Inter-Organizational Issues

The involvement of many organizations in a single program necessitates that the evaluator look beyond the service delivered and the organization contractually responsible for the service in its assessment. It is essential to look carefully at the environment and constraints of all organizations associated with the program effort.

An evaluation report on program logistics found several instances where the actions of other organizations affected the program outcome. Examples of this would include Bonneville's work with weatherization specifications and program aspects which have been contractually defined (Philips et al., 1986).

Field Weatherization

Organizational autonomy is essential to the evaluator. However, there is often a loss of information which accompanies the separation between program and evaluation staff. Project evaluation staff worked to maintain effective relationships with program staff in order to compensate for this potential loss of data.

The program descriptions found within this paper are in many cases grounded in the first hand knowledge of the evaluator. It is possible that many important aspects of information which has been documented by the Project evaluation staff would have been missed by a group which failed to temper its autonomy with involvement.

SUMMARY

In the spring of 1986, representatives of seven Northwest energy related agencies and the Hood River community gathered to celebrate the successful completion of the Hood River Conservation Project field weatherization. People spoke of new frontiers, cooperation, exceptional program participation, and high quality work. Through all of its roadblocks, unanticipated occurrences and tenuous moments, the Project had emerged a success.

The Hood River Conservation Project faced many unprecedented challenges. Never before had the organizations represented by the Regional Advisory Group cooperated for a common goal. The Project confronted these groups with a need to maintain consensus on an issue which had long been a source of disagreement.

A community specific, short term, high volume project was a new way of doing business for large organizations like Pacific Power and Bonneville. To compound this, the Project was subject to two sets of organizational requirements as well as the sometimes conflicting expectations of other organizations and community representatives participating in the Project's two advisory groups. Personnel on all levels established an inter-organizational dialogue which facilitated the resolution of these potential obstacles.

The field implementation of the Project presented many challenges for staff and contractors. Small contractors had to acclimatize to a big business atmosphere, large volume, unfamiliar weatherization technology and stringent inspections. Project staff were in turn confronted with high

prices, and the potential community repercussions of terminating poor contractors on the one hand, and not adding new ones on the other.

Project staff in some cases had to give up their permanent positions at Pacific Power. This reflected an internal attitude of the Project as being separate from corporate Pacific. This, however, did not translate into field autonomy in cases of hiring additional staff until later in the Project. In the course of the Project staff learned to work as a team, diversifying their skills so that they could function as a highly efficient entity.

There were points in the Project where, had an issue remained unresolved, the entire field effort would have been doomed to failure. The Project was a success because organizations and the individuals representing them were willing to challenge existing structures which were not compatible with Project needs and successfully implement innovative solutions to unexpected problems.

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