

Volunteerism and Technology Transfer: A Case Study

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INTRODUCTION

There are 779 Federal research and development (R&D) laboratories and research centers in the United States. They fall under the jurisdiction of 12 Federal agencies. Last year the total R&D budget for these laboratories was approximately 20 billion dollars. Collectively, they employ over 100,000 scientists and engineers whose knowledge spans virtually every facet of scientific and engineering know-how. This knowledge represents a priceless national resource.

Over the past ten years a number of experiments have been conducted in ways to transfer this R&D expertise to other areas of the public and private sector. One of the most successful involved establishing a Technical Volunteer Service (TVS) at both the Newport, Rhode Island and New London, Connecticut laboratories of the Naval Underwater Systems Center (NUSC). Under TVS, scientists and engineers at both NUSC laboratories can volunteer their services and personal time to assist state and local governments with the increasingly complex technical issues that they must face.

The benefits of this program are many: local governments gain a technical competence that they otherwise cannot afford; NUSC becomes integrated with the community; and volunteer scientists and engineers experience increased satisfaction as they see their help make a measur-

able difference. The logic of a TVS within a Department of Defense (DoD) laboratory could not be questioned once it was realized that the taxpayer would receive a greater return on money spent in R&D when government high-technology practitioners could be of service to their local communities. Simultaneously, the erroneous stereotype of civil servants as unresponsive, self-serving bureaucrats would be corrected.

Considerable planning went into initiating TVS at NUSC. It was necessary to establish a receptive environment within NUSC and the local communities. This article describes the program's development, the initial ingredients for success, important lessons learned, and specific examples of program results.

BACKGROUND

The time was 1977. A NUSC, New London laboratory employee, on his own initiative, was functioning as a volunteer technical liaison between his community and his work place. Harrison J. Fortier had become aware that the police in his community of Waterford, CT were having problems with their communications systems. He also learned at a civil preparedness meeting that the newly installed siren system did not perform to specifications. He took this knowledge of these two technically-based problems to work with him and began to "tap" co-workers for help in resolving them. Using this personal touch, he was able to acquire free

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sophisticated technical assistance for his local community.

Building on Mr. Fortier's initiative and example, the Office of Special Programs Development at NUSC set out to organize a NUSC-wide Technical Volunteer Service (TVS) that would provide technical assistance to those communities where laboratory employees resided. Four ingredients were vital to the success of this project: (1) the support of NUSC management; (2) finding the right person to coordinate TVS and provide liaison between technical volunteers and the local communities; (3) raising employee awareness and interest in community projects; and (4) raising awareness in the local communities of the assistance they could acquire free from NUSC.

Laboratory Management Support

Before starting TVS, it was necessary to obtain the support of top management at NUSC. Because of the high visibility of such a program in the local communities and its involvement with public officials, it was important that all parties have a common understanding of the program and the limits of their own authority and responsibility.

Fortunately, NUSC has a long history of successful technology transfer activities, making top management familiar with the concept of technology transfer, its methods, and goals. This made the task of introducing a potentially controversial volunteer technical assistance program easier than might otherwise be expected.

A special briefing was held for the NUSC Comptroller, since technology transfer was in his department, to outline the goals and objectives of TVS. At that briefing, guidelines were established to protect NUSC's public image: the volunteer effort should not be a drain on NUSC's mission-related work; an informal reference system should be established to ensure the technical credentials of volunteers; and the

volunteer effort was not to compete with private industry.

Finding the Right Person

The single most important ingredient for success was finding a person (Community Liaison Coordinator) who could serve as liaison between the technical people at NUSC and local government officials. Not an easy task. The position demanded sensitivity, a knowledge of local governments, and the ability to comprehend the technical aspects of a problem. It also required the ability to motivate technical people by pointing out how their unique skills could be applied outside NUSC.

In a very real sense, the Coordinator would act as a liaison between two very different environments, each with its own history, problems, resources, and "language." The NUSC staff consists of engineers, scientists, technicians, and support staff who are used to working with very sophisticated technology and employ a technical jargon that can be intimidating or unintelligible to an outsider. Local governments, on the other hand, have few technically-trained people, lower level technology requirements, little money, and speak a political-sociological-financial language that is alien to most scientists. The TVS coordinator had to interface with both these worlds.

What type of person could best interact with these two different groups? After careful thought, it was decided that the Coordinator need not be a technically-trained person (an engineer or scientist). The person would work in an office with technical support people whose years of experience and personal familiarity would help develop a linkage with the technical experts in NUSC. However, because there was little in-house familiarity with the workings of local governments, it was reasonable to select a person with a strong background in business, community affairs, and human relations.

After searching for almost a year, such a person was found and hired. She is educated in the fields of psychology, business and social work, and is experienced in marketing and community organization. In addition, she had over 15 years experience in the local volunteer and community service arena. Within a few months, after becoming familiar with NUSC, its employees, and the goals of technology transfer, the Coordinator initiated a plan for TVS. In addition to the constraints suggested by the NUSC Comptroller, this plan was always considered within the framework of one imperative--that user demand always be balanced with current capacity.

Raising NUSC Awareness and Interest

Technology transfer was not a new concept to most NUSC employees since the Office of Special Programs Development has been in operation since the early 1970's. What was new was the idea that NUSC technology could be beneficial to the communities right outside NUSC's gates.

Over a three-month period, to (1) educate NUSC employees about the goals of TVS and (2) indicate how the military work they do every day might serve useful nonmilitary purposes, intensive use was made of NUSCOPE (a biweekly in-house newspaper) and the NUSC weekly bulletins. Articles documented the type of volunteer projects already underway in one community and discussed highly technical areas where technology transfer did work, such as an employee-designed liquid level sensor for blind persons. The device lets the blind know when their coffee cup is full without having to stick a finger in the cup. Another highly technical area involved the use of finite-state-analysis in modeling human tissue. This was useful in determining the effects of radiation and heat in cancer treatment. The employee publication articles, however, also

highlighted lower technology projects such as a systems analysis of the reporting methods for a local women's center and a rotation schedule for a local police department to assure the presence of a supervisor on every shift.

The weekly NUSC bulletins carried notices on the initiation of TVS and the announcement that survey forms would be available to NUSC employees to determine their interest in forming a TVS. The form was designed and reviewed by people on the technology transfer staff, as well as those experienced in local government. This ensured that it included information that was useful to the Office of Special Programs Development, to municipal requestors, and to the person who would coordinate volunteer activities. Simplicity was a prerequisite. Federal employees are already exposed to too many complicated forms, and might reject responding to a survey if the form is too complex.

A second key feature of the form was its focus on hobbies and special interests of the respondents. Experience has proven that this information was fundamental to later success. The combined knowledge of a volunteer's education, special interests and hobbies, as well as his or her actual job experience, allowed the selection of NUSC's best qualified volunteer for each project. This survey was mailed to all hands with a cover letter suggesting areas of technology where volunteers might be needed.

The first week after the survey was mailed, 181 forms (out of a 3000 employee population) were returned to the Office of Special Programs Development, indicating a surprising level of employee interest. The volunteer pool was made up of engineers, technicians, secretaries, computer scientists, and physicists. Currently TVS membership has increased to 350 in-house volunteers, with an additional 60 NUSC retirees forming an adjunct branch called TVS-Retired (see section on Recent Developments).

So well known is TVS now that the Coordinator can call on almost anyone at NUSC to ask for help if the proper skill cannot be found on the NUSC roster of volunteers.

When TVS was officially launched in August 1978, it was decided that volunteers would receive regular written updates on the program's activities. Such updates advised who volunteered for what projects; it also reassured those who had not yet been called upon that the program was alive and current. In addition, it educated volunteers to the type of help being provided in local communities. Sometimes publication of such information spurred similar projects in another community, or caused an exchange of ideas between volunteers assigned to a similar task in different communities.

These updates have evolved into a full-fledged monthly newsletter that is now mailed to all in-house volunteers, NUSC department heads, retirees, local librarians, several levels of municipal officials in the towns surrounding NUSC's two laboratories, other Federal laboratories, and anyone else who requests copies. The newsletter informs the municipal officials about the variety of expertise available at NUSC and highlights new products with potential for municipal application that emerge from Federal R&D.

NUSCOPE, the regular in-house newspaper used to introduce TVS to NUSC, is used periodically now to discuss a particularly innovative project, to provide an in-depth outline of a particular community need, or to give extra visibility to volunteers for outstanding work they perform.

Raising Awareness in Local Communities

In August 1978, a letter was mailed by the Community Liaison Coordinator at NUSC to each mayor, city manager, and first selectmen in Connecticut, Rhode Island and the area of Massachusetts closest to NUSC. The letter announced the

formation of the TVS at NUSC and invited local officials to phone the Coordinator if they needed technical assistance. The municipal leagues in each of these states (the Connecticut Conference of Municipalities, Rhode Island League of Cities and Towns, and Massachusetts Municipal League) shared their mailing lists, publicized the program in their newsletters, and helped coordinate requests for technical assistance.

The original letter generated enough requests to warrant the program. Although only a few requests came in at first, as word spread and successes were added, this number increased until now there is a constant stream of about four requests per week.

HOW THE TECHNICAL VOLUNTEER PROGRAM WORKS

The Community Liaison Coordinator serves as the link between TVS at NUSC and the local communities. Requests for TVS assistance are received from mayors, city managers, administrative aides, municipal department heads, local nonprofit agencies, and small businesses. They are asked to state their problem in enough detail to ascertain which technical specialty is required.

During initial discussions with the requestor, the Coordinator determines whether the project would be in competition with the business sector. If TVS would not be competing with the private sector, if the project is within NUSC's expertise, and if it is of sufficiently short duration, it can be accepted for consideration. Projects that, for example, seek to replace the town engineer or a consulting contract are rejected. If the organization has funds to pay a consultant, if the project is an engineering study, or clearly falls into a small business service category, a project is rejected as a volunteer task. If a Technical Volunteer works with a small business requestor, it is with the understanding that information provided is not proprietary; it can be

passed on to other businesses as well. The role of a TVS is to add a technical dimension to local planning and decision making, not to eliminate the need for technical professionals.

Without promising a solution, the requestor of TVS services is told that NUSC's volunteer resources will be checked. If such a check turns up a qualified volunteer, that volunteer is asked to make a more technical assessment of the problem, again without the promise of help. The volunteer then reports back to the Coordinator. Between them, they discuss the requirements of the project, volunteer suitability to the task, and whether the volunteer's work schedule will accommodate a volunteer project. (NUSC employees work a Flex-Time schedule and are expected to make up any time spent during normal working hours on volunteer efforts. They are also expected to check with their supervisor before accepting responsibility for any project.)

If everyone agrees to the time and technical requirements of the task, the volunteer is given the responsibility to carry out the assignment. A record of the assignment is contained in the NUSC Technical Request form. When the project is completed, this form must be returned to the Coordinator. Its arrival signals that the requestor should be notified of the proper channel for sending a letter of appreciation. This letter is directed to NUSC's Commanding Officer who adds his own words of appreciation, sends a copy to the in-house newspaper for publication, forwards the letter to the volunteer, and submits a copy to the NUSC Personnel Office for inclusion in the volunteer's personnel jacket.

Certain details are accomplished behind the scenes. If a previously untapped volunteer is selected, the Community Liaison Coordinator checks with the person's supervisor for references as to technical competence, communication skills, character, etc.

On a few occasions, it was determined that the TVS could be of assistance to a local community within the guidelines previously cited but the time requirements made it too lengthy to qualify as a volunteer project. In these few cases, a contract for services was drawn up and the municipality paid NUSC for the help received.

RESULTS

In almost four years of operation, TVS has completed hundreds of projects in the three-state region. Here are examples of how this program helps in very practical ways:

An engineer responded to the request of an assistant manager to evaluate whether a siren company, the only bidder for a city-wide system, produced a product that fulfilled their requirements. It was found to be adequate.

A public works director was considering the purchase of some very expensive, high technology leak location equipment (for buried pipes). He was unsure about the performance quality of the equipment and whether his nontechnical staff could be trained to use it. A TVS retiree attended the vendor presentation, asked clarifying questions, ensured that the product performed as advertised, and will help train town employees in its use. (He was even offered a job by the vendor, which he did not accept.)

Another town's administrative aide was requested to draw up specifications for a new public address system. However, the meeting room where the equipment was to be located had unsatisfactory acoustics. He sought recommendations to solve the acoustic problems. Next, a NUSC technician volunteered to compile a list of necessary components for the new system.

The NUSC Energy Coordinator, recently returned from a three-year Intergovernmental Personnel

Act assignment to the Rhode Island Governor's Energy Office, trained NUSC retirees at both Laboratories to do lighting audits for energy conservation purposes. They plan to use their expertise to audit municipal buildings within their home communities free of charge. They could also add to their income by doing lighting audits for corporations.

Unexpected Rewards

There were a number of unexpected results in the program. The small community focus of this program serves as its best advertisement. Often an employee brings a problem to the attention of the Volunteer Coordinator rather than vice versa. Employees, aware that help is available, work to ensure that their hometown gets every possible technical benefit from the program.

Another plus for the program is an improvement in NUSC's public image. Before TVS' inception, NUSC carried a mysterious think-tank label. Because this program allows employees to interact with the community officials on a person-to-person basis, the citizenry is now aware that NUSC employs a technician who is a whiz at sound amplification, a management analyst who can encourage a nonprofit agency's Board of Directors to get actively involved in operations rather than serve only in an advisory capacity, and a computer scientist who returned to his alma mater to help his former teacher implement an administrative computer software package. Because of such steady interaction through TVS between NUSC employees and municipal officials, there has been an increased respect and understanding of each other's expertise and problems.

The monthly newsletter has also become a serious instrument of technology transfer. It allows people who have technical experience to learn about recent research results. They can then apply those results to new areas. For example, the newsletter listed a new paint developed at a Maryland Navy Laboratory. This

paint kills marine organisms that destroy wood. A lobster fisherman called asking if the paint might solve the problem of lobster pot destruction during certain seasonal cycles. The lobsterman was put in touch with the Navy researcher to explore the possibilities. The paint was not appropriate, but the researchers made several alternative suggestions for solving the problem.

As another example of this same process, a NUSC retiree called for more information on a new mosquito eradication product. It seems his community has severe infestation problems. With readers attuned to the research world acting on behalf of their own community, the transfer of research results from laboratory to the private sector seems to happen naturally.

In summary, TVS encourages a broader range of technology transfer than originally supposed. It also establishes solid community networks on which future liaisons with the private sector can be built.

RECENT DEVELOPMENTS

Retirees

In March of 1980, the decision was made to add NUSC retirees to the pool of volunteers. It was hoped they might be able to handle projects that, while appropriate to volunteer effort and NUSC's area of expertise, were too time consuming for regular TVS volunteers.

This move added additional strength and impetus to the program. The method of soliciting technical problems differs slightly with the retired group. A monthly meeting is held by them on a rotating basis, at various town halls around the region. This enables town officials and department heads to meet directly with the retirees, become familiar with their abilities, and discuss potential problems at length.

A system has been established to assure that TVS retirees have access to laboratory resources, the library, equipment, and personnel. This ac-

cess to the latest ideas and equipment, coupled with the volunteers' years of experience and personal acquaintance with NUSC, constitutes a very rich resource that increases the value of the TVS to local communities.

In October 1982, the Administration on Aging funded a national demonstration project to create TVS programs with retirees at selected laboratories across the country. At this writing, operational services exist at Lawrence Livermore Laboratory (Livermore, California), Naval Air Development Center (Warminster, Pennsylvania) and David Taylor Naval Ship R & D Center in Carderock and Annapolis, Maryland. Technically trained retirees from the community are encouraged to join laboratory retirees in these new programs. Such unification provides not only the opportunity for meaningful volunteer placements but aids the community through better incorporation of new R & D results.

Corporate Volunteer Councils

TVS has also formed a link between Federal laboratories and the Corporate Volunteer Council (CVC), which actively encourages their own employee involvement programs. Occasionally, NUSC's TVS joins with CVC in joint community projects. As the CVC network expands, there will be more opportunities for other Federal laboratories to join local CVC councils. The creation of these local resource networks will serve to increase the resources and number of volunteers available toward the solving of community problems.

CONCLUSIONS

TVS works well at NUSC for a number of reasons, some of which are peculiar to NUSC and its environment. It is important to recognize that each Federal laboratory is unique in terms of location, area of expertise, parent agency and, most importantly, its management and employees. The beauty of a volunteer

program is that these differences can be accommodated. An effective program at each laboratory would recognize the constraints and needs of that laboratory and its nearby communities. This is being demonstrated as new ideas for Technical Volunteer programs emerge. They are based upon the success of the NUSC model. However, each proposed idea is uniquely appropriate to its own environment.

Lawrence Livermore Laboratory is interested in using retirees to help the small business community. The Naval Air Development Center wants to use a group of Technical Volunteers-Retired to explore new product development as well as provide municipal service. In the Washington, D.C. area, two laboratories want to explore the feasibility of establishing a shared Skills Bank that will address local problems. Each laboratory takes the concept and forms a program that is in keeping with its expertise and with local community problems.

Technical volunteers are a valuable source of talent. A program like the one at NUSC clearly demonstrates the national potential for applying such talent. Still largely untapped, this resource is bought and paid for by our own tax dollars. A TVS is one suggestion to obtain a better return on that investment.

Nearly thirty laboratories have expressed interest in a TVS program. It is anticipated that the program will be institutionalized at a growing number of the previously mentioned 779 Federal laboratories providing new jobs as well as new opportunities to put the technical skills of Americans, young and old, to use in new ways that promote efficiency, productivity and new businesses.

The original NUSC Technical Volunteer Program was one of 70 finalists under consideration for one of President Reagan's ten Outstanding National Volunteer Program Awards. As measured by service to the community, acceptance by laboratory

management, and satisfaction for the volunteers, this program has been an outstanding success. The time is ripe to transfer this program to other Federal laboratories, universities and industry.

For more information, contact your local FLC regional coordinator or Donna Mansfield, P.O. Box 25, Boro Station, Groton, CT 06340 (401) 596-4007, or Dr. Eugene Stark, Chairman, Federal Laboratory Consortium, Los Alamos National Laboratory, P.O. Box 1663, Mail Stop A185, Los Alamos, NM 87545.

The Federal Laboratory Consortium was responsible for the initiation of this innovative volunteer program.