Changing Times: Evolution of the Technical Services Department

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"All service institutions are threatened by the tendencies to cling to yesterday rather than to slough it off, and to put their best and ablest people on defending what no longer makes sense or serves a purpose." The Technical Services Department (TSD) was formed in 1982 with a clear mandate to manage these "tendencies" described by Peter F. Drucker ("Why Service Institutions Do Not Perform," Chap. 12, in *Management: Tasks, Responsibilities, Practices,* 1974). TSD has since evolved dramatically. Even those of us who are engaged in producing daily change would acknowledge that the propensity to cling to yesterday is always present. This article illustrates how we counter these tendencies. It identifies how we recognize the need for change and how we go about making it. We begin with a historical perspective that is needed to appreciate the changes that have been made and to understand who we are today. Next, TSD's current concept of operations is presented. To conclude, our strategy to manage future change is summarized. (Keywords: Change, Concept of operations, History, Managing change, Technical services.)

GENESIS

In August 1982, the Technical Services Department (TSD) was created from several previously existing organizational entities—all reporting separately to the APL Director's Office (Fig. 1). The mission of this new service department was to provide *commonly required* services to the staff and sponsors of the Laboratory in four major areas: engineering (hardware development), plant facility operations, information, and computing. Consolidation of these activities under a single department structure was aimed at improving the management of these service entities and enhancing customer interactions. In every service area, there were compelling reasons to both modernize facilities to keep pace with technology advances and reengineer services to reduce costs, speed up service delivery, and increase customer satisfaction. The more universal and immediately compelling of these reasons was the need to modernize. Modernization enabled the reengineering and cost reductions that were to follow.

The facilities and equipment supporting the engineering, design, and fabrication of hardware were nearly all obsolete and lacked both the planning and funding necessary to modernize. Exceptionally skilled staff
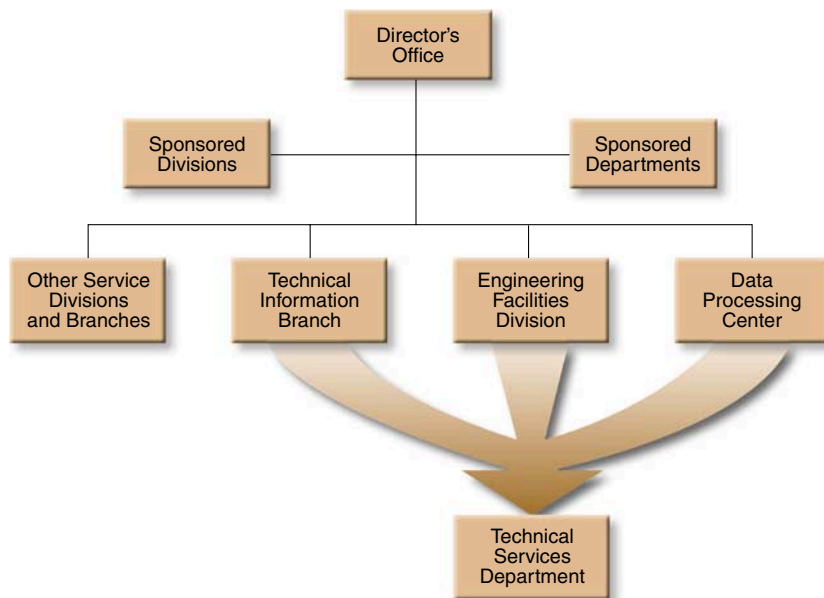
Figure 1. The Technical Services Department was created in August 1982 from previously existing organizational units.

had performed engineering miracles using World War II surplus equipment housed in "temporary" tin Butler buildings that were nearly 30 years old at that time. As talented as our workforce was, APL hardware programs required modern engineering tools safeguarded in an environment designed for the development and insertion of advanced technology. If APL were to meet future requirements for hardware development and maintain the hands-on competency that it treasured and considered core to its mission, substantial modernization would be required.

Plant services were predominantly driven by day-to-day operating requirements, with planned maintenance and future growth given less-than-needed priority. Although the facilities were well maintained, they were aging; major renewal and new construction projects were urgently required. A systematic means of specifying, planning, and then managing these projects was not in place. A master plan for site development was also lacking.

Information services were labor-intensive and not prepared for the revolution in information technology that was just beginning to emerge at that time. Like other R&D institutions, APL needed to modernize the production and dissemination of information it generated and the ways and means of acquiring the external information that would benefit its technical work and management operations. Investments in such a rapidly changing technology were known to be short-lived but nevertheless essential. An investment strategy was needed.

In every service area, advances in computer-based technology were pushing requirements and opportunities for advanced capabilities faster than they could be funded or managed. This was especially true for TSD's computing services. Although our data processing facilities and resources were relatively modern,[1] they were centered on mainframe computer operations that were becoming increasingly difficult and costly to use.

Mainframe use had reached a peak in the early 1980s, but then began to diminish rapidly with the advent of minicomputers and later desktop PCs. Minicomputers and PCs offered more control of the resource to the end user, were more affordable and easier to use, and supported a wider range of applications than the mainframe. Running against the trend to decentralize computer operations, there was at this time some interest in acquiring a supercomputer, but the requirements never truly materialized to warrant the substantial investment. The challenge that lay ahead for computing services was as much cultural as it was technology driven. Mainframe computing was becoming a tool for financial management, not technology development. Realignment to its new customers would not come easy for those who took justifiable pride in supporting the technical accomplishments of APL. Ultimately, even the financial applications would move to a distributed network of desktop and minicomputer systems.[2]

Little or no capital and very limited operating funds were set aside to address these problems. This was the first order of business for the management of APL's new service department. The Laboratory's financial resources were not like those of in-house government R&D laboratories and federally funded R&D centers. There was no separate special source of government funding for modernizing APL facilities or equipment. New buildings were built with JHU funds on JHU-owned land, but equipment was entirely funded out of annual operating budgets—either directly by a sponsor for special-purpose use or indirectly by all sponsors via overhead for general-purpose use. To modernize, TSD needed a major capital investment (>$25 million) for the construction of a new, advanced technology building, as well as substantial increases (>$3 million) in annual operating expenses from overhead budgets over a 5-year period for equipment and training. Fortunately, these financial requirements were met in the mid- to late-1980s, because this was a period of considerable growth and development for APL.

The Early Years (Mid- to Late-1980s)

While TSD management focused in these early years on developing modernization plans and acquiring funding to support them, TSD service providers and their immediate supervisors faced other challenges: implementing the modernization plans, improving the quality and responsiveness of services, lowering costs, and inserting new technology during a period of unprecedented growth in demand for these services. Although they were superbly led by working leaders and supervisors, the success of these efforts was primarily due to the talent and spirit of the entire TSD workforce. Rather than fear change, they embraced it. The Department's training and commitment to employee involvement spawned enthusiastic advocates for change and leadership for service improvements at all levels in every service area. Quality teams led by the most knowledgeable TSD workers were formed to evaluate requirements; select, install, and use modern capabilities to deliver services; make process improvements; and improve customer interaction and feedback. Here are just a few examples from each service area.

The drawing boards of illustrators and artists and the drafting boards of engineers and designers were replaced with modern computer workstations. This change allowed TSD staff to advance their careers as well as their capabilities by enabling them to deliver services better, faster, and cheaper. Machinists, sheet metal workers, welders, electronic fabrication technicians, and assemblers began to develop hardware with computer-controlled equipment that empowered them to satisfy increasingly complex technical requirements and faster production times—and for less cost (see the article by Wilson et al., this issue). Out went labor-intensive World War II surplus equipment and in came modern computer-based tools that yielded added value (e.g., miniaturized components, "smart" materials, rapid prototyping) as well as lower cost.

Information production, dissemination, and retention underwent a series of computer-enabled improvements, and the first miles of what became the "information highway" were traversed. APL staff access to information opened up and then sped up, while costs went down. Librarians facilitated the move into cyberspace by helping Laboratory staff to master electronic searches rather than rifling through a manual card catalog and numerous journal indexes. While book and journal collections continued to be maintained "just in case," the Library's information brokers shifted their priorities to delivering global information to APL desktops "just in time" to meet a pressing information need.

Plant service operations likewise shifted to computer-scheduled planned maintenance, automated building systems with energy conservation strategies, computer-aided facility design, and industry databases for cost estimating and management. Cross-training and skill development—which paralleled the introduction of these new capabilities—improved the proficiency, value, and job satisfaction of these TSD employees.

Just as some TSD staff during this period were beginning to use computers as tools of the workplace, data processing professionals within TSD were preparing for the revolution in computing that was just beginning to occur everywhere—the networking and distributed use of desktop computers. APL staff were increasingly abandoning mainframe terminals for the more user-friendly PCs, which gave them more control and more software applications that were better suited for their individual needs. But PCs also turned their owners into managers of microcomputer systems that frequently required help for quirky operating systems, nonstandard peripherals, and applications prone to "terminal errors."

Technical support for these systems became an enormous challenge because the technology and diversity of vendors and applications grew chaotically. Standards, which were imposed on mainframe users, were difficult to formulate for PC users because of the rapid changes in PC systems. Besides, it was impossible to prescribe standards for PC users who took the "personal" part of personal computers quite literally! Service and support for these systems without standards seemed hopeless. Macintosh fanatics and IBM diehards sought to connect to each other without giving anything up in the process. APL advocates and crusaders for Novell and Microsoft debated about which networking system offered the best interoperability. Standards were needed to provide user help for the most popular systems and applications, but they were no easier to develop than the mainframe was to use. Nevertheless, the expertise that had been developed in supporting mainframe systems and users rapidly transformed itself to similar tasks for the new age of networking desktop computing.

Eight years after TSD was created, the Department accomplished the last and perhaps most significant step in modernizing our engineering, design, and fabrication capabilities, i.e., the design, construction, and occupancy of the Steven Muller Center for Advanced Technology (Bldg. 13) in 1990. This new center is the second largest and most complex building at APL. It houses a number of modern facilities (e.g., microelectronics, materials, and CAE/CAD laboratories)—all equipped to develop and insert emerging engineering technologies as advanced solutions into some of APL's most challenging programs.[3]

What Peter Drucker[4] said about service institutions clinging to yesterday and defending what no longer made sense did not apply to the TSD of the 1980s. If anything, we were changing faster than many felt was appropriate for a service organization. This was not just a matter of introducing new systems and modern equipment or reengineering service functions; it was equally

a matter of a cultural change in the management of those resources. The principles and practices of Total Quality Management (TQM) were introduced into the Department with little difficulty. "Employee involvement" transitioned from quality teams (which were encouraged) to process action teams (which were essential) to self-directed work groups (which are now commonplace). This was as revolutionary a change as any action that was undertaken. As a result, the service functions of TSD became well aligned to the mission, goals, and objectives of the Department, and these, in turn, to the mission and service needs of APL. Functions that did not fit were eliminated or transferred to another service department where the alignment with their mission was better. These cultural changes were not only essential to modernizing TSD in the early 1980s; they enabled us to meet and master what was to become a difficult period of change in the early 1990s.

The 1990s

Although funding for defense was declining nationally, Laboratory funding in the early 1990s was increasing to a record high. Similarly, TSD was addressing unprecedented service demands in every area, but that was to change dramatically. Within two years, one major service area would be realigned and transferred to a new service department, and another would be downsized by more than 50%. By the mid-1990s, the other two service areas also would undergo significant downsizing. And before the new millennium, there would be two more significant organizational changes within TSD, followed by a resurgence in service reengineering and growing demands for the three remaining service areas.

TSD faced a new modernization challenge in 1990. The financial and business applications that had been created by software developers at APL over the previous 30 years were aging and fragile. Documentation of the homegrown accounting applications was sparse. This old software, like the mainframe it was written for, was too costly to maintain, much less modify. The business environment it supported was changing rapidly and would continue to do so for years to come. It lacked mandatory functionality to support multiple contracts, to address increasingly complex accounting requirements, and to provide timely financial reports to management. Even a simple functional change became a complex task to ensure that there were no unintended consequences. An entirely new suite of business, financial, and management software was needed.

To meet this challenge a Laboratory-wide team was formed, led by TSD, to assess future requirements, reengineer APL financial systems and practices, and develop a plan to transition from the obsolete mainframe-based software to commercial off-the-shelf systems deployed on a distributed network of minicomputers. After approval

of the plan, implementation began in 1991[2] and ended with the formation of a new service department, the Business and Information Services Department (BISD). TSD transferred most of its computing resources to BISD in order to realign the mission of these computing resources to the business and financial staff that used them. Those resources that were retained by TSD were realigned to the engineering, design, and fabrication services that they supported. These realignments provide yet another illustration of how TSD has facilitated change rather than clinging to the past.

TSD is prepared for the future because we have thrived on change—some of it expected, much of it not.

Greater change was still to come. By late 1991, TSD was completing its efforts in support of the development of the Midcourse Space Experiment (MSX) satellite,[5] the largest ever built by APL. With the completion of MSX, demand for engineering, design, and fabrication services fell from a 25-year high in 1991 to a record low in 1993. Demand instabilities, especially those caused by the time-phasing of future space programs, were common experiences in TSD, but none had the impact of this one. Even though several prospects for new programs were just two years away, there was no alternative but to reduce the size of the staff and eliminate all but the most essential capabilities.

After conferring with customers and stakeholders (APL central and Department management) about what capabilities to retain, the workforce was downsized from a maximum of more than 300 to less than 150. Proportionally greater reductions were taken in the number of management positions (from 32 to 14). This reduction in force was a historic first for APL. TSD had managed fluctuations before by using temporary contract employees to meet the peak demands. This was not possible in 1993; more than half the reductions taken were APL employees. Some major facilities and services were eliminated altogether. Others were temporarily closed. These changes seemed to foreshadow the general downturn in APL funding that was to follow and last throughout the mid-1990s.

By the mid-1990s, following the general trend in defense funding, overall Laboratory funding had declined by nearly 20%. To compensate, substantial efforts were made throughout APL to reduce overhead costs, leading to another reduction in force in 1995—this time Laboratory-wide for the first time in APL history. The size of the engineering workforce was reduced again (about 10%). Those who provided TSD

information services experienced a similar level of reduction. There was, however, a much greater decline (nearly 30%) in the number of plant services employees due to diminished renewal and renovation activities curtailed by the overhead reduction and a coincident falloff in new building construction.

Despite the disruptions that accompanied these reductions in force, the quality of services as measured by customer satisfaction rose significantly during the mid-1990s. The performance improvements achieved during the decade were primarily attributable to

- The modernization investments made in the 1980s to improve productivity, speed service delivery, and lower costs
- Employee involvement in process improvement and customer satisfaction
- Management restructuring of the TSD organizational units into flat, leaner business units that promoted self-directed work teams and encouraged multiskilled career development

This leads us now to discuss TSD's current organization and operation.

CONCEPT OF OPERATIONS

"Form follows function," i.e., the structure of an organization should be adapted to enhance its function. (Although frequently attributed to Peter Drucker, the phrase, "form follows function," may have originated from an earlier quote, "form ever follows function," from world-renowned architect, Louis H. Sullivan.[6])

As a service organization, the form of TSD differs greatly from that of the sponsored, technical departments at APL, the principal customer base for TSD services. Our service delivery is typically neither a top-down nor bottom-up process. Functional requirements for services flow into the TSD service units directly from their customers rather than down from the Department through a program management structure. Commitments to delivery of those services are usually made directly by the service providers themselves, or by their immediate supervisor or team leader. These commitments are monitored at a higher level to ensure that adequate resources are available, costs are controlled, and conflicting priorities are resolved if they arise. This process maximizes customer focus as well as employee involvement in the work process. Work is managed by project teams that, once formed, are commonly self-directed. This "form" of management emphasizes operational performance, i.e., customer satisfaction. It also requires fewer numbers and layers of management; for example, TSD groups on average are three times the size of typical APL groups and have staff-to-supervisor ratios that are a factor of three greater than is common within APL. The eight groups are considered as strategic business units of the Department, each responsible for planning and operating its business within guidelines and constraints established by the TSD management team (Fig. 2).

The Department management team comprises the group supervisors and Department managers. It addresses policy, resource allocation, performance, and operational issues common to all TSD groups and provides a forum for information exchange among them. The roles and responsibilities of all members of this team have been defined and documented in our *Directory of Services*.[7] Another document, *Management & Operations*,[8] specifies the service mission and functions of each
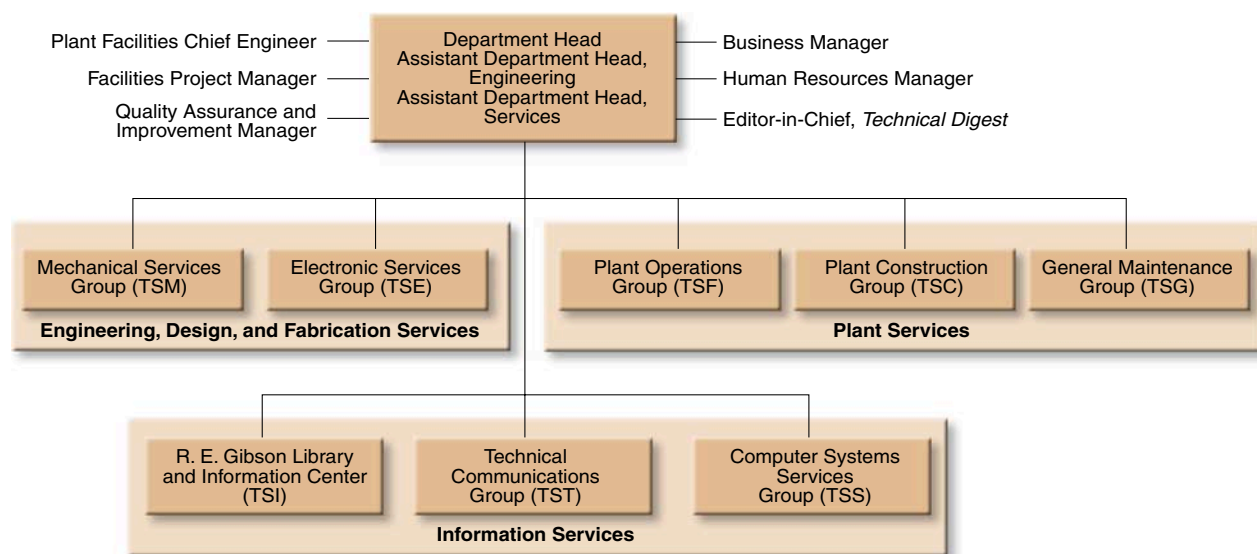

Figure 2. TSD organization chart.

group and identifies how those services are requested and provided. Three Department-level managers support the day-to-day operations of the eight groups: Human Resources, Business, and Quality. Two other managers are responsible for planning and oversight of major construction projects at APL. The two Assistant Department Heads and the Department Head provide executive direction to TSD supervisors and managers and represent its operations and capabilities to the leadership of the Laboratory. One Assistant Department Head is responsible for assessing service requirements and performance of the TSD business units; the other is responsible for assessing resource requirements and developing investment strategies and plans.

The principal advantages of this concept of operations are that it is performance-focused on customer satisfaction, management lean (horizontal, flat, less costly), and staff empowered. The principal disadvantage is that the demanding responsibilities of resource management and service delivery are concentrated under just a few managers. That it works is a credit to the TSD staff.

The Staff

The TSD staff numbers about 400, making the Department one of the larger at APL. Its composition

and diversity of skills are its most remarkable characteristics, distinguishing it from any other Laboratory department (see the boxed insert). TSD staff range in experience and training from entry-level labor to internationally recognized professionals in advanced technologies. Regardless of their jobs, they share a commitment to working with each other for the common benefit of an uncommonly prestigious R&D institution. They strive to be as good at what they do as the engineers and scientists that they support throughout APL. It is also evident that the engineers and scientists who are their customers value this identification with their work and often share the recognition of success with them.

One important feature of TSD throughout its history has been staff-directed change. Employee involvement has meant more than leading change in the workplace; it also has meant leading change in themselves. While TSD employees have better equipment and work in better facilities than those of a generation ago, they are also more demanding of themselves and typically better trained. This is partly because more is expected of them, and partly because they have been given the opportunity to improve their skills and develop new ones. A decade ago it was common to work in skill-centered groups, made up of people having the same skill or

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THE MORE THAN 80 SPECIALTIES OF THE TSD STAFF.

3D animator	Electrical engineer	Metalworker
Administrative aide	Electrician	Microelectronic design and
Administrative assistant	Electromechanical designer	development specialist
Administrative secretary	Electronic designer	Microwave design specialist
Administrative specialist	Electronic packaging specialist	Multimedia specialist
Air-conditioning mechanic	Engineering assistant	Network engineer
Analytical chemist	Engineering designer	Nondestructive test and evaluation
Application systems assistant	Engineering technician	specialist
Applications software engineer	Experimental machinist	Office administrator
Archivist	Experimental sheet metal worker	Offset duplicating technician
Artist/illustrator	Facilities engineer	Painter
Assembler	Financial manager	Photographer
Audiovisual assistant	Furniture finisher	Physical chemist
Automobile mechanic	Graphic service technician	Physicist
Biomechanical engineer	Groundskeeper	Plumber
Biomedical engineer	Grounds maintenance specialist	Process engineer
Building systems technician	Human resources manager	Programmer
Business manager (CPA)	Information aide	Property manager
Cabinet/model maker	Janitor	Publications specialist
Carpenter	Laborer	Refrigeration mechanic
Civil engineer	Librarian	RF engineer
Clerk	Library science specialist	Sanitation driver
Composites engineer	Maintenance worker	Secretary
Computer software designer	Materials handler	Stationary engineer
Computer systems technician	Materials science specialist	Technical assistant
Computing systems specialist	Mechanical designer	Technical writer/editor
Copy machine operator	Mechanical engineer	Technician
Design specialist	Mechanical fabrication technician	Television production specialist
Digital imaging specialist	Metallurgist	Web developer

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trade. Today most TSD work is project-centered; people with different skills come together to achieve a common objective. This creates a learning experience that promotes mutual appreciation for the skills of others and cross-functional training. Welders learn sheet metal skills, model makers learn how to make and shape composites, carpenters learn the basics of electrical wiring, electricians learn the best techniques for patching drywall or laying brick, electronic fabrication technicians learn computer-aided design, designers learn about fabrication constraints, photographers support Xerox centers, Xerox operators learn imaging skills to improve quality, librarians develop information to support strategic planning, and planners learn search techniques to keep abreast of what others in their field are doing.

Working within the framework of project-centered activities also creates a sense of individual pride, increases our flexibility to respond more quickly, and enhances our ability to better manage fluctuating demands for a particular skill. As large as we are as a Department, as a Laboratory, and as a world-renowned University, it is a small world when it comes to the individual's desire to learn more and contribute more. There is no greater satisfaction in the workplace than job satisfaction, and no better way to get it and give it than from each other. This is why the supervisors and staff of TSD have devoted so much of their time and interest to developing not only their own careers, but each others. We sometimes say in TSD presentations that we are the "hands" of a hands-on Laboratory. We know that ours is sometimes just a helping hand, but at other times it is our handicraft that makes the difference. But whatever we do, we have learned to do it better because that is what is expected of us and what we expect of ourselves. This leads us to a brief discussion of the common purpose and values we have as an organization.

Mission, Vision, and Goals

All books on management emphasize the absolute importance of getting the mission statement just right. Ours is *to provide technical services that are commonly required to support the mission of the Laboratory*. If time is the test of a good mission statement, then ours must be a good one since it has not changed from our beginning in 1982. Suffice it to say that if you get it right, stick with it and your mission will help bring about needed change; if not, then the mission statement will follow change rather than lead it.

Not that the TSD mission is without some controversy. The phrase *commonly required* means that the services TSD provides must have a broad customer base throughout the Laboratory, not a narrow focus on one or two APL programs or departments. It does not mean

that all programs and all departments must require all of these services all of the time, or that the requirements from every program or department must be identical in kind or level of demand. Still, the dilemma of the TSD service manager is that no one needs all of the services, but all of the services are needed. So "commonly required" has been a contentious mission issue throughout TSD's history, and remains so today. Some believe that unless TSD services provide nearly equal benefit for all programs and departments, we should either not provide them or their users should pay the full cost. Over the years, this comparable benefit issue has spawned a number of actions that have shaped how service requirements are assessed or anticipated; how costs for these services are recovered; and whether they should be centralized in TSD, performed in the department of the dominant user (insourced), or performed by outside contractors (outsourced). No mission statement could eliminate these issues from arising, but a good one goes a long way in resolving them. That has been TSD's experience.

The vision of the Technical Services Department has been developed from two crucial perspectives:

As viewed by our customers, our vision is to be seen as *the preferred provider* in each service area. Unlike some institutions, APL has no policy that requires our customers to take services from TSD. Although such a policy looks awfully good in lean periods of demand, we have learned that customer choice is the critical measure of value for service providers. Rather than compelling them to use our services, they can opt to outsource or insource. This freedom to choose creates a competitive environment for TSD that service organizations rarely experience; for us, however, it has generally been beneficial.

As viewed by our staff, TSD's vision is to be seen as *the preferred employer*—one that provides challenging and rewarding work in a safe, healthful, and productive workplace. In today's environment of record low unemployment, every employer must compete for good workers. But an internal service organization has always had to compete not only externally but also internally for its top performers. The emphasis given to staff development and employee involvement has always been a key success factor in this competition.

TSD's goals, which are important elements in our concept of operations, were developed in small group meetings between TSD staff and management. Although our service functions are quite disparate in kind, scale, and costs (e.g., designing microchips vs. constructing major buildings and facilities), we have these goals in common:

1. Consistently satisfy the requirements of every customer. Practically speaking, this may be a "mission

impossible," but as a customer, would you expect anything less?

2. Continuously improve the capabilities and contributions of every TSD staff member. This is another tough goal, but as a TSD employee, would you want anything else?

3. Maximize the benefit of TSD resources and the efficiency and effectiveness of TSD services to APL sponsors and staff. It is not sufficient that we achieve a high level of performance in service delivery; we must also ensure that our services broadly benefit as many APL programs and staff as possible. To achieve this, customer proactive involvement in our planning process is crucial. This means not just customer endorsement, but customer ownership of our plans.

4. Consistently measure and improve TSD performance. This is the tenet of all change agents. Without measurement, it is difficult to know what to change. Without change, why bother to measure? The good old days only seem that way if you have no objective measure of them. For TSD, these measurements take several forms: day-to-day customer feedback, focus groups of customers and stakeholders, customer-assessed plans for service improvements and capability development, long-range investment plans, periodic Director reviews, and participation and leadership in external benchmarking activities.

By setting these goals and then consistently working to achieve them, TSD has made the timely changes and continuous improvements that were needed to serve its customers and to meet the challenges of the past two decades. We have, so far, overcome "the tendencies to cling to yesterday." But what about tomorrow?

FORCE FOR CHANGE: 2000 AND BEYOND

In 1982, TSD modernization was a goal; today it is an accomplishment credited to many agents of change—the TSD staff who made it happen, the management of APL who supported it, and our customers who expected it. In 1991, at the height of this accomplishment, and having just the year before experienced record high demands for all TSD services, we began a two-year descent into record lows. For TSD, the forces for change shifted rapidly from the exhilarating (modernization) to the frightening (loss of funding). This plunge in demand for services was caused by a much smaller decline in APL funding, mostly a consequence of the conclusion of the Cold War era. For TSD, it illustrated just how sensitive service demands are to uncertainties—even small ones—about APL's funding and future. It was a nightmare then, but a lesson learned in preparing for tomorrow.

By 1996, new, more encouraging forces for change began to emerge as APL funding stabilized. TSD was now challenged in different ways. It was hard to believe that just four years later TSD would be

- Completing the construction of a major new APL building and implementing an enterprising, forward-looking site development plan that calls for the construction of an even larger building within the next four years
- Undertaking an aggressive program for plant renewal of existing offices and laboratories
- Transforming its information services to meet a multimedia surge in demand to support strategic planning, new business development, technology transfer, external technical communications, aggressive Laboratory-wide staffing plans, and a wide range of knowledge management applications
- Expanding and improving hardware development capabilities to meet (and, in some areas, lead) new business opportunities in transportation, law enforcement, information warfare/operations, biomedical engineering, space-related advanced technology development programs, and numerous technology transfer initiatives (including licensing and creating spin-off companies)
- Enhancing strategic relationships with regional institutions to conduct collaborative research and development in a broad range of advanced engineering, design, and fabrication technologies
- Completing several major hardware development projects for fleet air defense and taking aggressive staffing and training measures to support three new space programs in as many years

For TSD, the next few years, like the past few, promise us a wide range of increasing opportunities and challenges in every service area, with no time to cling to yesterday. While the outlook is indeed quite hopeful, our strategy (learning from the past) is good old-fashioned pragmatism:

Step 1: Perform for the present (customer satisfaction is everything).
Step 2: Plan for the future (good things can and do happen).
Step 3: Prepare for the unexpected (cultivate agility).

The TSD workforce is responsible for Step 1 in this strategy. TSD service providers are better skilled, equipped, trained, and motivated, and are more empowered than ever to perform . . . and they do. I have a wall in my office where I pin up customer feedback. It is layers deep in citations of commendable performance from other APL staff who take notice of the service they receive, and from admirals and senior

government officials who have had a glimpse into what we do and find it most remarkable. What motivates this kind of performance in a service organization? Perhaps it is because our customers are our co-workers; perhaps it is the reputation of APL and the Johns Hopkins University for outstanding achievement in so many disciplines; perhaps our staff expect a lot of each other. It is likely all of that and something more: I believe that the TSD staff are just good at what they do, and they enjoy doing it. Whatever the reason, their performance is exceptional and we rely on that every day.

TSD depends on its supervisors and managers to plan the future (Step 2). They too are better skilled, equipped, trained, and motivated, and more empowered than ever to plan for and lead their organizations. They consistently exceed expectations. "Doing more with less" is what has become commonly expected for service organizations . . . and TSD is no exception to that rule. TSD leaders and those who follow them cannot cling to yesterday; there is not enough funding to do so.

The service planner's problem, as noted earlier, usually comes down to the following: everybody needs some service, not every service is needed by everybody, but every service is needed, and there is never enough money to pay for them all. This predicament can be seen as a reason for doing everything that is asked or an excuse for not doing something in particular. Either way, it requires TSD service planners to negotiate trade-off requirements among our customers, capabilities within our own staff, and resources with APL management. Recognizing this, TSD leaders seldom wait long to initiate change; we sometimes lead change faster than our customers and stakeholders are comfortable with. The Department's *Capability Development and Facilities Investment Plan: 2000–2004*[9] was developed to help reconcile these concerns, but more customer involvement in the development of these plans and more stakeholder ownership are crucial to preparing for the future.

How prepared are we for the unexpected (Step 3)?

- "Strategic planning," the management maxim of the 1970s, has been incorporated into TSD's concept of operations, so we are already thinking ahead.

- "Customer focus" and "continuous improvement," aphorisms of the quality movement in the 1980s, have been embedded into our service delivery, so we are already strengthening our relationships and our capabilities.

- "Right-sizing" and "process reengineering," the organizational axioms for the 1990s, have been applied to both TSD form and function, so we are already lean and out-of-the-box thinkers.

- For the next ten years, agility in adapting to unexpected change *is* the expectation. We experienced this type of change throughout the 1990s, good and bad. We have come to understand and accept that the "cheese" (from Spencer Johnson's book[10]) is always moving, and we must move with it. (Johnson has become a best-selling author by offering widely praised insights on how we all deal with change and how we might learn to manage it better in the workplace and in our personal lives.)

So it would seem that we are better prepared than ever for the unexpected, and we are—but not for the above reasons. TSD is prepared for the future because we have thrived on change—some of it expected, much of it not. We have experienced much change, and we manage it well. As for the tendency to cling to yesterday, the temptation recurs, but is gone tomorrow. After all, "yesterday" was a millennium ago.

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