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1999 (36th) Countdown to the Millennium

Apr 28th, 2:00 PM

Paper Session II-A - Nuts and Bolts

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Nuts and Bolts

Suppose they built a new launch pad and nobody came.

Imagine Kennedy Space Center in mothball status, weeds choking walkways, buildings crumbling back to nature, launch towers red with rust. Imagine what was once a critical mass of the world's finest space engineers and scientists now dispersed, their collective synergy lost forever. Imagine that they counted down to the millennium in 1999, launching it with fanfare and high hopes, but learned too late that the launch vehicle was flawed, an undetected self-destruct mechanism activating and slowly, yet inexorably, shutting down critical systems.

This is not a science-fiction story, nor is it a doomsday prediction. It is, however, a tale about keeping the plant running, about trying to reduce the high cost of sending up rocket ships, about the nuts and bolts of enhancing our nation's space lift capability,

The entire Space Coast of Florida has evolved dramatically since those first heady days when John Glenn electrified a nation with his short voyage outside the earth's atmosphere. Three major federal installations have established firm roots, making history -- even as history made them ever more viable. NASA's Kennedy Space Center (KSC) is on Merritt Island, just a causeway away from the Air Force's Cape Canaveral Air Station (CCAS). Patrick Air Force Base (PAFB), home of the 45th Space Wing, is only a few miles to the South. Until October, 1998, each of these facilities was

maintained and operated relatively independently. Operational cooperation and some resource sharing were in place, of course, but base operations support was largely a local thing, provided through multiple contracts.



A new approach to Base Operations and Support

By 1995, it had already become clear to senior managers in the federal government in general and at the Space Coast in particular, that massive infusions of funding for new space programs or new facilities were becoming anachronisms. Doing more with less became the byword as well as a stark reality. Furthermore, the trend toward

commercial use of space had accelerated, and it was becoming increasingly clear that KSC and CCAS would be launch locations of choice only if they made good business sense. The Space Coast cache might attract the tourists, but safe, reliable support at reasonable costs would be necessary if commercial launch customers would choose to use the facilities. Doing business as usual could well lead to no business at all in a few decades, or worse, in just a few years. One obvious area for potential savings was the

consolidation of base operations and support under a single contractor.

Space Gateway Support (SGS), a Joint Venture of Northrop-Grumman, ICF Kaiser, and Wackenhut Services, was selected in early September, 1998, as the Joint Base Operations and Support Contractor (J-BOSC) for KSC and CCAS, as well as for some initial activities at PAFB that will increase over time. Responsibilities include facilities and utilities, logistics (supply, transportation, propellants), medical services, engineering, protective services (both fire and security), safety and mission assurance, environmental management, information management, and other duties as assigned.

SGS proposed to accomplish its essential mission at lower cost with fewer workers, without sacrificing quality or safety, relying heavily upon innovations, consolidations, and a no-holds-barred focus on new ways of doing business. An integral part of the SGS plan is the inclusion of subcontracts, many of which have been awarded to local firms, including small and small disadvantaged businesses. Subcontracts as well as purchases from vendors and suppliers, will account for about 36% of the total contract cost.

By the end of the first quarter, some inroads have already been made in terms of cost-effectiveness. No activity or process is too small to consider if savings might be achieved. No idea is rejected because it might be difficult to implement. By sharing some ideas and initial experiences, we hope to contribute in a nuts and bolts way to advancing our ability to gain access to space. The more responsive and efficient support on the ground becomes, the more likely are our nation's launch and tracking facilities to be seen as the location of choice by commercial and international clients.



Consolidation

Consolidation of multiple contracts into the single J-BOSC provided an opportunity for some immediate cost reductions simply because a single management group now replaces the management hierarchy that had been in place at each of the pre-J-BOSC installations. In addition, combining work forces was intended to improve productivity because variations in work load (the peaks and valleys of manpower utilization) could be smoothed by scheduling a larger work force than had been in place at KSC or CCAS. Furthermore, if multiple shops in each maintenance category

(e.g., plumbing shop, structures shop) are combined into a single shop, supervisory and scheduler requirements can be reduced. By consolidating, fewer facilities will have to be maintained and some space can be freed up to accommodate activities now housed in trailers and other temporary offices. It was with these expectations in mind that SGS, including its team subcontractors, initially hired a work force totaling 2600 workers.

J-BOSC work began on October 1, 1998, after a short 23 day transition period. An effort was made on the first day of operations to provide the same level of service using the same processes as had been provided before. Changes would follow in an evolutionary way until the final consolidation plan is achieved. This promise has been difficult to keep, both because even a minor step away from the old way of doing business may evoke cries of anguish and because October 1 launched one of the most frenetic 31 day periods in many years.

There are two distinct cultures that must be considered in consolidation at the Space Coast. The process and supporting paper by which work had been ordered on both sides of the river dividing KSC from CCAS were different. Each installation had a unique method for communicating within its own organization and with supporting contractors. Each boasts a proud heritage; change itself poses a threat to many. It is almost daily that we hear: "You should do it this way because we always did it this way!" To some extent the culture clash is cushioned by SGS' client, a Joint Performance Management Office (JPMO) established specifically to oversee the selection and execution of J-BOSC. Even so, SGS continues to devote attention to evolving toward common processes, especially for work control.

Union Issues

The two largest unions each hold jurisdiction at one of the installations, the Machinists at KSC and the Transportation Workers at CCAS. Each treasures its hard-earned territorial claim. Bridging agreements with the various unions were put in place prior to the start of J-BOSC. Negotiations leading toward a new, common collective bargaining agreement began in December and are scheduled for completion by the Spring. Both sides of the table recognize that the sword of Damocles hangs overhead until and unless we together are able to make the Space Coast of Florida a location of choice for current and future commercial and international clients.

Into the Maelstrom

SGS supported five successful launches in October, including the Glenn event where the press corps alone numbered 150% of the entire SGS work force. Despite a Presidential visit, a NASA/Air Force Open House, unusually heavy activity at the Navy Port, heightened security needs because of international terrorist activity, and some growing pains, SGS survived the first month having met every mission requirement. The initial consolidation was working, but substantially more remained to be accomplished. Examples of completed and ongoing consolidation efforts that will save as much as \$100 million over the ten year life of the J-BOSC include:

- Consolidate the electrical, plumbing, carpentry, generator, sheet metal, and paint shops by providing one main hub for each trade, thereby reducing manpower requirements and freeing up space that can accommodate activities now being conducted in trailers;
- Consolidate the separate CCAS and KSC fire force and security force structures into a single Protective Services for the two installations combined. This approach began to attract notice and bear fruit early on when some guards wearing uniforms previously associated only with CCAS provided much needed assistance at KSC during the Glenn launch. (A new, common uniform

is now worn by all security forces, but the late delivery of these new outfits provided a serendipitous boost to the virtues of consolidation.);

- Reduce the number of government vehicles by taking advantage of lesser fleet requirements associated with consolidated shops, re-examining the justification for every truck, sedan, and special purpose vehicle, and rearranging some shift times and activities so that the same vehicle is productively used on multiple shifts;
- Move activities out of trailers and into space freed up by consolidation activities. Turn in for disposal or resale off the installations a total of at least 40 trailers during the first year, including 20 in the first six months;
- Combine the 24 hour duty offices now operating at KSC and CCAS in a single location from which the entire space complex can be supported;
- Put in place a new Emergency Center that will handle 911 calls regardless of which installation they originate from; and
- Consolidate mail operations between the 45th Space Wing and KSC.

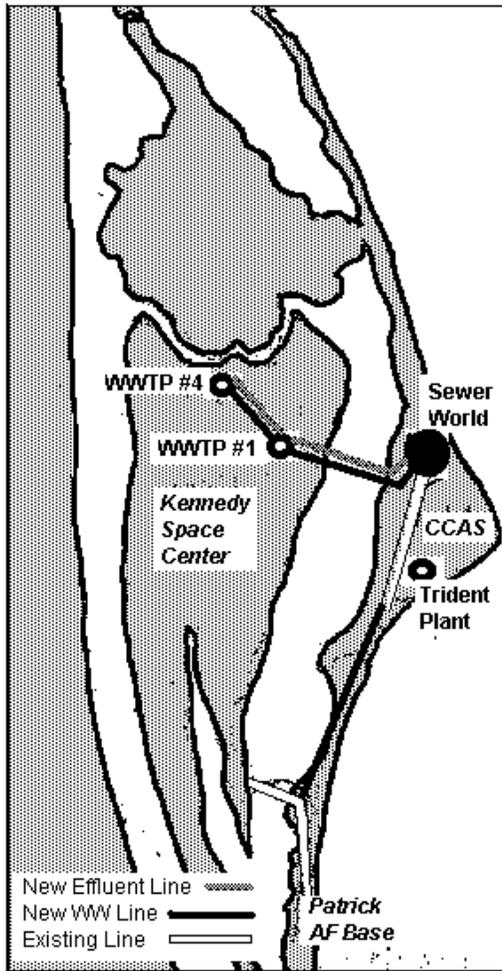


There have been moments of challenge when mission-critical outages occurred. A particular example is a power outage that knocked out most buildings and systems that support shuttle launches. Fortunately, the event was not coincident with a launch! The system was restored within a few hours, but the root cause was not identified until the next morning. Believe it or not, a large bird, possibly a buzzard, defecated directly upon an insulator at the substation where power is delivered from Florida Power and Light to the installation. Officially designated a bird streamer, this unusual type of outage has been recorded at various locations in Florida more than 100 times in the past decade,

The Wastewater Treatment Opportunity

Conditions surrounding collection, treatment, and disposal of wastewater at KSC, CCAS, and PAFB on October 1 included some noteworthy items:

- PAFB sends its wastewater to Cocoa Beach for treatment, paying for the service on an annual contract basis at a relatively high cost;
- Two old plants at KSC (#1 and #4) operate at only 48% of their usage-to-design ratios and require substantial maintenance;
- A modern wastewater facility at CCAS (commonly referred to as *Sewer World*) operates inefficiently at only 19% of its design capacity;
- The inflow at Sewer World is often so dilute that the biological processes necessary for successful treatment cannot be sustained; and
- Treated effluent that might reasonably be used for irrigation, chillers, and deluge water is disposed of.



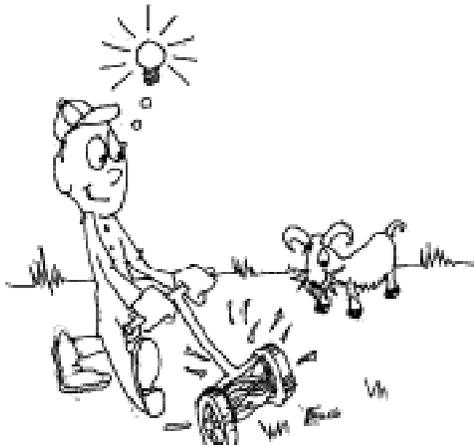
The J-BOSC allows SGS to take a holistic look at what makes sense for all three federal installations. Considering utilities such as water/wastewater and power distribution as complex-wide rather than installation-specific is well within the SGS charter. Some early savings are already being achieved in water/wastewater as a result of implementing actions that do not require permit or contract changes. These and other proposed changes are illustrated on Figure 2. A study is now under way to verify cost savings, environmental impacts, and contractual feasibility. The total savings associated with improvements in wastewater treatment are expected to exceed \$20,000,000 by the end of the 10 year contract period for J-BOSC. Major features of the proposed approach include:

- Renegotiating future contracts for waste water disposal to better reflect actual daily flows anticipated during the year following renegotiation;
 - Converting old plants #1 and #4 to lift stations, piping waste water to Sewer World, and consolidating operating staff to reduce labor costs;
- Using treated effluent to reduce the cost associated with potable water now used for irrigation, deluge, and chillers; and
 - Making commercial arrangements wherein the government is paid by commercial entities to accept waste that is needed to deal with the dilution problem at Sewer World.

Innovations and the Transformation Office

A Transformation Office (TO) is an integral part of the SGS organization. It is within this group that new business practices are being examined and sea changes in operational approaches are developed. The TO is both a catalyst that permits acceleration of new processes and the yeast that aids in the fermentation of new ideas. Even at this early stage in the life of J-BOSC, TO has brought together several commercial users who together are expected to derive multi-million dollar benefits from a common helium pipeline, and is involved in meetings with several commercial firms who may be able to assist SGS in provision of the benefits of privatization well in advance of solicitations that may be published in the next fiscal year. Other examples of innovations being considered by the TO or now being implemented by SGS include:

- Contracting with commercial vendors to provide just-in-time delivery to work sites, thereby reducing inventory requirements, eliminating much of the supply point-to-work site delivery now being done internally, increasing opportunities for competition, and allowing local small and small disadvantaged businesses to play a larger role;
- Placing heavy emphasis on full implementation of Reliability Centered Maintenance (RCM), a practice that is expected to yield significant long term benefits. Even at this early stage, laser alignment of shafts in mission-critical equipment is demonstrably quicker and more accurate than the old, laborious stress gauge use; and routine infra-red scans are identifying hot spots in the power distribution system before a resulting failure can occur;
- Reduce the need for federal capital investments by applying commercial leasing practices that often include maintenance and temporary equipment replacement when a leased item is out of commission for repair. A subcontract has now been put in place with a local minority business enterprise that permits SGS to replace critical equipment items, either temporarily while repairs are made to existing equipment, or permanently to replace items that are no longer economically repairable -- all without the need for capital investment by the government; and
- Outsourcing certain non-core functions to commercial businesses by competing requirements among local businesses.



Little things mean a lot

It is often the person in the trenches who knows exactly how to do a job better, faster, cheaper, more safely. Workers at every level and in every discipline are encouraged to come up with ideas. Examples of effective ideas that have bubbled up include:

- The corrosion control shops have reduced the number of line items required for paint and other protective coatings from 385 to 88, reduced inventory by 2,000 items, and disposed of outdated products -- all without sacrificing the ability to provide the optimum coating for any item that has ever been treated in the history of KSC and CCAS;
- SGS' Energy Management Office assisted in implementation of the purchase of natural gas from a third party, resulting in an annual savings of about 30% of prior baseline costs;
- During the conduct of the aforementioned wastewater feasibility study, it was discovered that a nearby commercial packager receives regular shipments of food-quality syrup by tanker trucks. Two fresh water rinses of these stainless steel tanks yield a product rich in nutrients that has until recently been disposed of at some cost and inconvenience to the packager. The

environmentally benign, nutrient-rich rinse water is now trucked to Sewer World, helping to solve the dilution problem there and creating a win-win situation for both parties. Early laboratory results are showing a significant increase in BOD in the untreated wastewater (a desired outcome) and effluent with quality significantly better than that specified by regulatory requirements;

- Oily wastewater is now being hauled to the Trident pretreatment facility, saving annual off-site disposal costs of nearly \$50,000; and
- Some work shifts have been eliminated because the statistical demand for emergency response in the past ten years is small, most requirements can be anticipated and satisfied on other shifts, and because the response time for services by workers who may occasionally be called in is well within required operational parameters.

Launching the New Millennium

As the year 2000 approaches, efforts to achieve and maintain cost effectiveness without sacrificing safety, quality, or reliability will continue unabated. As commercial launch activity increases, there will be direct interfaces between SGS and non-federal entities. SGS will develop a fixed price catalog for a variety of services, including provision of all base operations support associated with launch of a particular type of vehicle. As efficiencies and economies are achieved in support of government requirements, SGS will seek to apply the capacity of its labor force that has been freed up to increasing demands from the commercial side. Our goal is to retain stability in our work force, yet provide reliable support at a lower cost so that more business can be attracted.

American ingenuity, undaunted spirit of a dedicated work force, savvy clients, and national needs are going to keep the Florida Space Coast the launch location of choice for generations to come. SGS intends to be the contractor of choice to meet base operations and support needs.