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Proceedings of a Workshop

IN BRIEF

July 2019

Facilities Staffing Requirements for the Veterans Health Administration—Engineering Administration

Proceedings of a Workshop—in Brief

The National Academies of Sciences, Engineering, and Medicine convened a workshop on March 5-6, 2019, at the Keck Center of the National Academies in Washington, D.C., to explore staffing considerations for engineering administration at the Veterans Health Administration (VHA) of the U.S. Department of Veterans Affairs (VA). This workshop was part of a larger effort undertaken by the Committee on Facilities Staffing Requirements for the Veterans Health Administration to prepare a resource planning and staffing methodology guidebook for the VHA Facility Management (Engineering) Programs. Brian Yolitz, associate vice chancellor, Facilities, Minnesota State University, noted that to support the committee's effort to develop a model for VHA staffing in engineering administration, workshop speakers shared information about (1) data and data management, (2) contracting strategies, and (3) perspectives on challenges and expectations at various VHA facilities. This *Proceedings of a Workshop—in Brief* summarizes the presentations and discussions that took place during the workshop.

CAPITAL RESOURCE SURVEY DATA AND ENGINEERING

Mike Reed, product/service manager, Healthcare Engineering, VHA, explained that budget and full-time equivalence (FTE) levels for engineering facilities are set by the individual VA medical centers. The Capital Resource Survey (CAPRES) is a tool to help VA Medical Center chief engineers assess their facility engineering services. CAPRES is merely a collection of existing data; it does not dictate a level of FTE or provide any recommended actions, and, in some cases, the data are either incomplete or incorrect. Reed noted that CAPRES is continually evolving, especially as a result of this National Academies' study. Prior to this workshop, the committee provided the following six questions to the VHA, and Reed responded to them during his presentation:

1. *Why is there so much variation in the maintenance and upkeep of VHA buildings across the United States?* Reed explained that there are many variables—age and layout of facilities, facility condition assessment (FCA) backlogs, complexity levels, preventative maintenance programs, and infrastructure funding levels—all of which dictate existing staffing levels. There are also various staffing competency levels and turnover rates, and chief engineers are sometimes unable to get buy-in from medical center directors to execute construction projects.
2. *What steps have been taken to address these variations?* Staffing and funding levels are primarily established by each facility—the VHA Central Office (CO) provides relevant data but does not mandate certain levels. Reed hopes that this National Academies' study will address these variations by setting minimal levels/acceptable ranges for staffing and funding to manage VHA facilities effectively. The maximum funding level for minor construction projects has already been increased from $10 million to $20 million, and the VHA has developed and will continue to refine performance metrics. VHA CO-Engineering has also created a plan for recruitment and retention to ad-

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dress recent staffing shortages and competency issues.

3. *Are the administrative data relevant and being captured effectively?* Although Reed believes that the data are relevant, the data collection and verification processes could be improved. He said that CAPRES will want to track the data that come from this committee; if a model with a staffing level and budget range emerges, it would be useful to evaluate which facilities are falling above and below that range.

4. *Are there gaps or weaknesses in the administrative data?* Reed acknowledged that although there are gaps in the data, after outliers are removed, the data still reflect accurate system trends. A weakness could be that no reports exist to correlate the data into more useful information for decision making. If CAPRES were to be used for VHA benchmarking, instead of only by chief engineers, better data entry and verification would be needed.

5. *If there are gaps, what recommendations would you make regarding administrative data collection and usage?* Reed noted that the VHA directive that mandated CAPRES was eliminated a few years ago. If CAPRES is to be used for VHA CO-based performance metrics, he continued, a new directive could serve as motivation to increase the accurate reporting of data. CAPRES would need to be verified at least semiannually in this case. He said that additional training on cost centers and budget object codes is needed for the appropriate personnel (e.g., if the wrong cost center is entered, incorrect data will be pulled).

6. *Is there a correlation in CAPRES between the facility staff and the FCA cost-to-correct?* Reed believes that the FCA data are correct but acknowledged a lack of correlation and wide variations. Some of these variations could relate to a chief engineer's inability to secure funds and spend appropriately to execute projects. To illuminate the lack of correlation, he highlighted two locations with the same FTE and complexity but vastly different backlog costs and square footage.

Robert Goodman, principal, The Innova Group, shared his concerns about the lack of training for and understanding of CAPRES as well as the absence of a reliable way for the system to capture financial data. David Alvarez, VA, said that the more sophisticated facilities use CAPRES effectively and likely have the best data, while the facilities that need the most improvement often have the worst data. Kimberly O'Keefe, Department of the Army, asked how CAPRES data support budget requests to Congress. Reed explained that CAPRES data are not currently used at the national level for budgeting purposes; however, at the facility level, directors could use CAPRES to look at similar facilities and ask the directors of those facilities how they are making changes with a particular amount of money. Alvarez added that FCAs largely drive the capital side of the budget request, which are disconnected from staffing. O'Keefe emphasized that there should be a correlation to staff and that the ability to articulate priority needs in budget requests is important. Robert Anselmi, VA hospital engineer (retired), asked if there is any national guidance on FTE for the Office of the Chief. Oleh Kowalskyj, deputy director, Healthcare Engineering, VHA, said that the only requirement is to have a chief and an energy manager. However, he noted that there is an internal VA initiative to standardize position definitions and grading.

Because the backlog is only a snapshot of the state of a facility, Yolitz asked how much volume of construction is being executed by FTE—if there is no money to work on the backlog, staff are not needed; if there is a surplus of money, more staff are needed. He wondered what other influential factors are missing from CAPRES. Reed clarified that CAPRES does track how much funding is accomplished and how much of the FCA backlog is completed in a given year. However, CAPRES does not reveal whether one site has a better *process* than another. CAPRES allows people to understand a site's compliance, although Reed noted that metrics for measuring quality could be improved. Cameron Oskvig, National Academies, suggested that the VA look into the Defense Health Agency's (DHA's) functionality index.

Anselmi asked whether the FCA is growing over time. Kowalskyj noted that facilities will degrade and missions will change, but mission-essential FCAs remain priorities. In response to a question from O'Keefe, Reed said that the chief engineer updates the FCA annually. Jacob Yoder, chief engineer, Canandaigua VA Medical Center, and interim facility manager, Bath VA Medical Center, noted that the inspection to determine the FCA is done by a contract firm, and Kowalskyj added that these firms spend 3-4 days at the facility and rely on facility staff to provide the correct information. Yoder explained that the chief engineer also generates a quarterly report for deferred maintenance. O'Keefe pointed out that the FCA is a "moving target"; even if the facility is completing work, the FCA backlog could increase over a 3-year span.

Goodman asked if some facilities' poor performance is due to a lack of staff or a lack of training. Reed postulated that there could be higher levels of staff and better training in higher-performing facilities. Yolitz

said that the conditions of facilities have an impact on the recruitment, performance, and retention of staff as well as an impact on customers. Discussion ensued about the manpower function within the VHA, and Steve Broskey, VHA, commented that although there are VA-level and VHA-level manpower functions, modeling for staffing has been limited on the administrative side prior to this National Academies' study. Goodman emphasized that the committee needs more information in order to create the right model for administrative oversight. Reed said that the VHA first needs better performance metrics to measure whether facilities are meeting or exceeding expectations, and Broskey added that the roles and responsibilities of programs could be better defined to understand what resources are needed.

A VA MEDICAL CENTER DIRECTOR'S VIEW ON ENGINEERING ADMINISTRATION

Timothy Cooke, director, Martinsburg VA Medical Center, described the role of a medical center director as an entrepreneur who uses value judgments to invest funds effectively. He said that creating a standard for the Patient Aligned Care Team is challenging, given the implications for staffing, funding, and performance. He referenced an industry standard that approximately 13.8 mental health providers are needed for every 10,000 patients; however, he noted that engineering department staffing at the VA is usually determined by "feel," priorities, and cost, as opposed to industry standards—which then makes it difficult to measure quality. The VA has directives to ensure the safety of the organization, but related staffing standards primarily address only the highest levels of risk.

He explained that CAPRES does not reveal information about the quality of performance. Because the information in CAPRES is often unreliable, it is not necessarily an aid to decision making. Some chief engineers may not be equipped to run their own businesses and do not understand the data sets or what drives the FCA—and whether acting on the available data has any effect on construction awards. He emphasized that waiting 7 years to get the CAPRES data right when decisions at new construction projects need to be locked in within 3 months is not feasible. He bases his decisions on the idea that performance leads to trust, and trust is needed for standards to be effective. Thus, a mix of performance measures, standards, baseline performance, data validation, and leadership are needed to demonstrate a facility's value. However, the VHA has failed to invest significantly in those areas. He also described differences between the VA and the private sector: the VA is structured, rigid, and top-down, while the private sector is flexible and relies on independent contracting. Even as a VA medical center director, Cooke has no control over VA contracting decisions, creating a lag on the ability to act.

Goodman asked Cooke how to move from decision making based on "feel" to empiricism. Cooke said that more metrics that are connected to positive health outcomes for veterans are needed to measure medical center directors' performance. O'Keefe asked Cooke if he has a clear understanding of and appreciation for the health of his facilities and if he has established a priority as to how the different building components relate to patient outcomes. She also asked if requests to Congress are appropriately related to facility risk. Cooke described his repeated conversations with frontline hospital staff and veterans to understand and anticipate needs; he said that how well he plans has a direct impact on the facility's ability to provide care. While there will never be enough money to fix every problem, he believes that Martinsburg assesses risk well. The leadership is key in driving good decisions by making value judgments about long-term investments. Cooke mentioned that many medical center directors might not realize what they do not know about facilities engineering; those directors need to be provided with a baseline for safety and construction in order to make good decisions.

Goodman asked Cooke about the keys to success for engineering administration and the must-have staff positions. Cooke listed a number of elements, including safe operations in facilities, strong leadership, funding for training and succession plans that keep the organization stabilized (e.g., being able to move from a staff engineering position to a chief engineering position), funding for nonrecurring maintenance, investments in energy engineering, and a good planning and construction team that can be scaled up or down as needed. In terms of specific job functions, he said that a chief engineer, an assistant chief engineer, a project supervisor, a maintenance supervisor, and a business manager/administrative assistant are essential. Having an architect, an electrical engineer, and an activation coordinator (similar to an event coordinator) on staff can also be beneficial. He noted that some of the data captured in CAPRES help to predict the kind of team a director will need, but the decision is mostly an art form of "knowing the lay of the land." Michael Carrancho, chief, Engineering and Design, Smithsonian Institution, wondered if it would make sense to create a medical center facility leadership team composed of one engineer and one physician. Cooke said that the VA would be unlikely to approve that as a standard but acknowledged that finding the right mix for health-care leader-

ship is challenging. Building a strong team is not dependent on fields of expertise; it is more about willingness to work together and connect to the mission (i.e., making people feel valued, setting up a level playing field, being willing to listen, and taking on challenges). When asked how the "feel" for his facility relates to performance, Cooke said that peer satisfaction (i.e., having the chief engineer well integrated with the other services and able to communicate intelligently with diverse staff) is meaningful, but that is a characteristic that is difficult to measure.

Ambassador James Smith observed that nursing has defined outcomes more successfully than engineering, which results in better manpower levels; he suggested that although complicated, it should be possible to define risk and set similar outcomes within engineering. Cooke commented that it is more difficult to prove the value associated with engineering decisions, whereas a nurse can prove that there will be increased patient falls with fewer nurses on staff. Carrancho proposed creating a facilities readiness quotient to provide evidence of how increased engineering staffing is linked to improved patient care. In response to a question from Reed, Cooke emphasized that knowledge, goal setting, and accountability in shorter time frames are key for facility leaders.

PANEL ON CONTRACT AND LOGISTICS MANAGEMENT

Michael Carrancho observed that while the VA includes maintenance in its definition of engineering, the Smithsonian Institution focuses primarily on capital improvements related to construction and design. Carrancho said that the Smithsonian Institution comprises 19 museums, 9 research centers, 3 cultural centers, and 1 zoo. Six hundred buildings, 13 million square feet, and 43,000 acres of land are under Smithsonian care. The Smithsonian Facilities Capital Improvement Program projects a budget of approximately $150 million/year over the next 10 years, with an additional $150 million during each year of major renovations and an additional $5 million/year for minor maintenance projects.

The Smithsonian Institution has a unique approach to staffing: thirty architects and engineers in the Engineering and Design Division are divided into cross-disciplinary integrated facility teams (IFTs) that serve either a particular client or a geographic area. With this structure, teams have a leadership role in executing the capital and maintenance programs. This more client-focused "matrix" model does have workload capability and management challenges, including the following: (1) a critical mass of people is necessary to be viable; (2) allowances need to be made for individual work styles; (3) community management and consistency have to be emphasized; (4) IFT roles and responsibilities have to be formalized; and (5) business processes have to be continually streamlined. As a result, the Smithsonian Institution has presented case studies and best practices at IFT all-hands meetings; has conducted periodic assessment and course correction to address issues of standardization; continually monitors and shifts resources to manage workload; and has established a board to address issues of community management. Useful resources that have emerged for Smithsonian Institution staff include the Smithsonian Facilities Project Handbook (i.e., process flowcharts, forms, and roles/responsibilities), Community Management Plans (i.e., competencies and proficiencies), the Smithsonian Institution Facilities Design Standards, and the Smithsonian Institution's Best Practices Committee.

Carrancho explained that the Engineering and Design Division has a set of 34 indefinite delivery/indefinite quantity (IDIQ) contracts that are competitively selected using the Federal Acquisition Regulations Part 36 Brooks Act process (i.e., based on qualifications, not price). These IDIQ contracts execute 80 percent of the division's work and are typically each 1 base year with 9 option years. Goodman mentioned that the VA's decision to do its own contracting is both labor and time intensive; he wondered if, especially for rural areas, there could be a central contract in a larger location through an IDIQ contract. John Dodier, chief, Facilities Management, Portland VA Medical Center, noted that the Veterans Integrated Services Network (VISN) has IDIQ contracts with service-disabled, veteran-owned small businesses that are typically 1 base year with 4 option years. While no overall contract limit exists for the Smithsonian Institution, there is a $500,000 individual task order limit.

A few years ago, the Smithsonian Institution converted to using building information modeling (BIM) to execute projects. Innovative opportunities include design visualization, early clash detection, improved estimating and value engineering, four-dimensional (4D) modeling in construction planning, energy modeling, asset management, and building automation. The Smithsonian Institution's implementation of the Contractor Performance Assessment Reporting System (CPARS) was the next step to improve architecture and engineering quality, Carrancho explained. CPARS shows performance evaluations from federal agencies of architectural and engineering firms. The Smithsonian Institution has also implemented Client Feedback Surveys, which

have higher fidelity and higher frequency than CPARS. These surveys are distributed to all architecture and engineering project stakeholders, offering an opportunity to manage client expectations and make continuous improvement. Even though these surveys are designed to be client-focused, the chief of engineering and design can also learn about the in-house staff and Smithsonian Institution processes through this mechanism. Carrancho shared results from the surveys for one project, with one client, over a 2-year period. Because the Smithsonian Institution better understood the client's expectations, the satisfaction increased from 30 percent to 95 percent between the first and the second survey. The Smithsonian Institution also implemented a searchable Project Lessons Learned database, and information from this database is used to update design standards and the project handbook. In response to a question from O'Keefe about an integrated system for work orders and inventory to forecast requirements for budgeting purposes, Carrancho said that the Smithsonian Institution uses IBM's TRIRIGA software, in which work management and space management are integrated and used for forecasting 5-year capital planning.

Joconde Gaubert, director, Construction and Facilities Contracts, Georgetown University, shared information about construction and facilities management from a legal perspective. Georgetown University's chief procurement officer hired attorneys to help with contract management and negotiation, an approach that Gaubert believes is effective and efficient. She engages with various stakeholder groups (e.g., risk management, general counsel, design and construction, facilities) because open dialogue about contract terms leads to better contract negotiations with vendors. For example, indemnity is an important contract provision—the goal is to allocate the risk to the vendors. The warranty provision is another important component of the contract, especially for new construction. Insurance provisions are present; however, Georgetown University rarely includes a limitation of liability clause in its contracts with vendors. She explained that because Georgetown University is a nonprofit institution and is self-insured, it still has much to learn about shifting more risk to the contractor—for example, the institution only recently prohibited contractor default insurance provisions. In response to a question from Cooke, Gaubert said that if a project is $50,000 or less, Georgetown University collects two bids. For more expensive projects, additional bids are collected. Gaubert noted that she added a liquidated damages clause (i.e., the vendor pays for any delay after completion date) to the Georgetown University contracts, which is determined by the value of the contract, the risk involved, and the timeline, but she does not typically include a clause for shared savings for early performance.

Georgetown University's reasonable approach to risk is reflected in its contract templates, she continued. Georgetown University hires external attorneys to work with insurance brokers to put these contract templates in place for equipment and consultant services so as to provide faster service to stakeholders. A few months ago, Georgetown University issued a request for quotations, and out of 14 applicants, the university selected 9 architecture and engineering firms for IDIQ contracts. This eliminates the need to negotiate contracts repeatedly, and project work can be completed more quickly. Gaubert's office also collaborates with stakeholders on issues of procurement and contracting. In response to a question from Yolitz, Gaubert said that Georgetown University has a policy to promote diversity through contracts, so vendors must include information about minority- or women-owned small businesses in their proposals.

Goodman observed that both the Smithsonian Institution and Georgetown University ensure that a significant amount of labor is done by contracting agencies, and he wondered about similar staffing models for the VA. Yoder said that an IDIQ contract would be helpful for his sites, especially given the shortage of contractors in rural areas. Cooke noted that contracting support is variable in many locations and that waivers to bypass some of the current requirements could be useful. Alvarez suggested strategies to deal with staff shortages, including standardizing position descriptions, downgrading positions, and coordinating between facilities to share staff.

VA CHIEF ENGINEER PANEL ON ADMINISTRATIVE OFFICE STAFFING, TRAINING, AND HUMAN RESOURCES

John Dodier said that the Portland VA Medical Center includes two main campuses, Portland and Vancouver. The grounds are 28 and 52 acres, respectively, with 192 vehicles, including those for patient transport. The system also includes leased properties in Oregon, 12 clinics, and 3 locations on the Oregon coast. The Portland site has 4,000 employees. Dodier noted that the facilities are subject to more than 25 accrediting bodies and regular inspections and emphasized the value of customer service.

The sites are run by a chief engineer, a chief of projects and operations, a chief of maintenance and repair, and a chief of biomedical engineering. The chief engineer spends more than 60 hours each month doing

committee work, including engineering staff meetings. The chief of maintenance and repair acts as chief in the absence of the chief engineer. This person needs to be a degreed engineer and participates in design, oversees work order staff and shop supervisors, manages routine maintenance and construction, acts as primary emergency responder, and is a purchase card approving official. Purchase cards allow $2,000 for construction, $2,500 for services, and $3,500 for supplies (although some cardholders have a $10,000 limit). Dodier suggested that the limits for construction and services should be adjusted for inflation. Other positions in the Office of the Chief include an administrative officer, a secretary, a budget technician, a preventative maintenance coordinator, two work order clerks, and a special security assistant. An energy engineer, who is a GS-11, reviews water, sewer, electricity, and gas use but has no fleet management responsibilities.

Dodier noted that because the economy is booming in Portland, it is difficult to hire electrical apprentices. The Portland VA Medical Center participates in the VHA CO's technical career field program and currently has four technical career field interns (with three more approved), a general engineer, a biomedical equipment support specialist, two boiler plant apprentices, and two electrical apprentices. It also has eight compensated work therapy workers, two state licensed plumbers, and seven state licensed electricians. Twenty-three current staff are former compensated work therapy patients. He mentioned that there is too much required recurring training: much of it offers little technical improvement for staff, and travel for VA training is difficult.

Jacob Yoder oversees two New York campuses, Canandaigua and Bath. As chief engineer, he spends nearly 90 hours per month doing committee work. The Canandaigua site has 50 buildings and nearly 1 million square feet. The Bath site has 45 buildings (some dating back to the 1800s) and is 650,000 square feet. Yoder said that he has $8 million to $10 million to spend per year over both sites.

The Office of the Chief comprises the following positions:

- Chief engineer (i.e., the strategic thinker who establishes policy and procedure);
- One assistant chief engineer at each campus to manage maintenance operations and projects;
- Maintenance controller with an engineering background to help the chief engineer understand metrics, oversee the preventative maintenance program, and manage service contracts;
- Energy engineer;
- Secretary;
- Administrative officer (one for every 65 employees would be ideal);
- Budget technician to manage fund control points; and
- Fleet manager.

Yoder said that the VA provides a multitude of training opportunities to staff, many of which are available online. He described the assistant chief engineer as a crucial job: having someone learn the process while moving up through the ranks positively impacts the effectiveness of the facility leadership. This VA medical center also has a fire chief at each site, housekeeping staff, and a bioengineer. All decisions are initiated in the office of the chief engineer as well, and purchasing anything of great value (more than $2,500 for services and more than $10,000 for supplies) is required to go through the contracting system. O'Keefe asked if Yoder had thought about using a matrix approach to manage the two sites. He replied that because these two sites were separate medical centers until September 2018, it is not yet possible to think about sharing staff, owing to union negotiations. He added that because the sites are 50 miles apart, it could also be difficult to combine services.

Yoder noted that he currently uses work order data only to understand timeliness of completion. However, he said that with either a new work order system or staff better trained to use the Automated Engineering Management System/Medical Equipment Reporting System (AEMS/MERS), he could better use data to track productivity and to justify hiring needs. Adequate administrative staff, enforcement of maintenance staff not to do work without a proper work order, implementation of work order processes more fully in operations areas, and better documentation of time spent, materials used, and money spent for work order completion would also improve tracking capacity. Discussion ensued about the AEMS/MERS system: Goodman suggested that, keeping in mind the flaws of the system, the data could be entered correctly with the addition of work order staff. Alvarez noted that approximately 30 VA sites were upgraded to Maximo reporting system (the rollout of which has been suspended), while all of the remaining sites still use AEMS/MERS. Cooke said that his site uses AEMS/MERS effectively for work orders and material allotment but only to the extent that it is functional. The system is transferrable to another site only if the person receiving it knows how to use it: the system has been in place for 30 years and no changes have been made to its architecture.

Art Ontto, chief, Engineering Service, Oscar G. Johnson VA Medical Center, noted that his Iron Moun-

tain, Michigan, facility was constructed in 1948. Since 2006, $110 million has been allocated for capital improvements. The facility is complexity level 3 (the VHA assigned each of its inpatient surgical programs an "operative complexity" level of standard = 1, intermediate = 2, or complex = 3) and is the most rural VA medical center in the United States, with a city population of only 7,624. The medical center campus has 17 buildings, 27 acres, and 317,600 square feet of space. This VA medical center is also responsible for seven community-based outpatient clinics (between 80 and 225 miles away). The Office of the Chief comprises a team of individuals, with job duties as described in Table 1.

TABLE 1 Time Spent per Task, per Position at the Oscar G. Johnson VA Medical Center	
Position	*Time Spent per Task*
Chief engineer	• Meetings/customer service = 20 percent • Construction/projects = 20 percent • Supervision/employee engagement = 20 percent • Facility leadership = 15 percent • Inspections, union issues, and other miscellaneous items = 15 percent • Budget = 10 percent
Assistant chief engineer	• Project type work > 65 percent • Safety type work = 15 percent • Assistant chief duties = 10 percent
Maintenance and repair supervisor	• Supervision = 25 percent • Equipment management = 25 percent • VA goals and mission support = 20 percent • Facility maintenance liaison = 15 percent • Project assistance = 15 percent
Administrative officer/budget technician	• Facility maintenance and accreditation = 30 percent • Budget and finance = 45 percent • General program administration = 15 percent • Miscellaneous items such as the all-employee survey, quality assurance, and union issues = 10 percent
Program support assistant	• Administrative support = 55 percent • Human resources tasks = 30 percent • Timekeeping = 10 percent • Work order clerk = 5 percent

The Office of the Chief also has a biomedical equipment support supervisor and a boiler plant operations supervisor. Like Yoder and Cooke, Ontto is a strong believer in the value of the position of assistant chief engineer as a training program for chief engineers. He also indicated that he is trying to build technical and management skills among his staff.

In reference to the all-employee survey (see Table 1), which includes questions on the usability/quality of facilities, Cooke explained that the information collected is fairly easy to break down, readily available, and can be sorted by engineering functions to get scores for every medical center in the United States. Although the all-employee survey cannot tie staff satisfaction to the state of the facilities themselves, the Survey of Healthcare Experiences of Patients has a question about cleanliness of environment that can be tracked by

facility. This does not always relate solely to an engineering function, but it is an indicator that reveals whether a veteran views the facility as clean and comfortable.

To determine what is needed each year and articulate that need to the medical center director, Ontto's administrative officer looks at the previous year's budget and uses it to formulate a base budget for the coming year. He said that manpower requests are not included in that budget. Yoder indicated that his resource committee, which receives staffing requests, is very metrics-based. When his team realized that it was not keeping up with air conditioning and preventative maintenance load, it prompted the hiring of one additional staff person. In response to a question from O'Keefe about manpower requests, Ontto said that requests from his site for a work order clerk were not approved and a search for an energy manager did not draw any candidates. He also echoed previous statements about the difficulty of using work order data to gauge staff productivity.

Goodman observed that funding will not be supportive of much staffing beyond the basics required to operate. He asked, "What is the process to help us help you get the VA headquarters to change their thinking about this?" Yoder said that someone first has to clearly define "engineering" (e.g., should fire departments that do not typically fall into that category be included or not—this uncertainty could skew the reporting). Ontto said that funding needs to be resource-based. Although the VA asked Congress for an energy engineer for every one of the 170 medical centers, only enough funding for 100 energy engineers was provided, Anselmi added. Alvarez explained that the vision for the energy engineer funding did not work as planned because the lines between an energy engineer and a project engineer are blurred. However, a VA directive states that each VHA facility must be covered by a full-time energy manager. Broskey noted that an energy manager could cover more than one facility, as is the case in Bath/Canandaigua.

Ambassador Smith asked Yoder and Ontto if a centralized contract structure (similar to those used by the Smithsonian Institution and Georgetown University) would be helpful. Ontto said that he has been using IDIQ contracts for years, but that they include only small businesses that generally do not take on large projects. He added that VISN-wide architecture and engineering contracts (e.g., $20 million to $30 million) are necessary to move the work out of the small business realm. Yoder said that the Procurement Technical Assistance Center has been helpful, and he hopes for a similar resource at the regional level.

MANAGING THE OPERATION, SUSTAINMENT, RESTORATION, AND MODERNIZATION OF THE DEFENSE HEALTH ENTERPRISE

Capt. Nate Price, chief, Facilities Enterprise, DHA, explained that the hospital is the next most important place on a base after the flight line, where the fighter craft are. He added that administrative and operational space is more costly when located in a hospital and emphasized the value of a singular enterprise approach to facilities management. Capt. Price explained that people who work in facilities view problems systematically; an overarching goal for DHA is to ensure that facilities are transitioned without missed inspections or outages during restorations, for example.

Capt. Price described how the Department of Defense (DoD) uses sustainment measures, square footage, and facility type to determine funding levels. With 80 million square feet of military health system facilities, the dollars-across-facilities cost is about $2 billion per year, which includes the annualized military construction budget. In order to determine staffing levels, one must first understand what is going on within the hospital (i.e., Is an FTE doing health-care work or training to manage hospital construction in the future?). He said that staffing models exist that state how many staff are needed per square foot of a building (e.g., from the International Facility Management Association), but that DHA has adopted the Air Force's strong central agency concept instead. Capt. Price noted that the staffing level at DHA Headquarters should be approximately 400 people. Instead of having regional offices, DHA will have a central office with departments, divisions, and branches. Kaiser Permanente is adopting a similar span of control with a unified national approach to facilities; Kaiser insurance holders should have a single experience—buildings, facilities management, and operational/surgical practices will all look the same at each location. Capt. Price emphasized that such transitions take time.

SERVICE FACILITY ROLES AND RESPONSIBILITIES: HEALTHCARE FACILITY PLANNING FOR THE ARMY

Col. Michael Brennan, commander, U.S. Army Health Facility Planning Agency, and Health Facility Planning Consultant to the Surgeon General, provided an overview of the U.S. Army Medical Command (MEDCOM)

facility operations and maintenance programs and discussed challenges and lessons learned. He explained that, in the early 1990s, the U.S. Army transitioned from having no oversight to having to be accredited. This required a change in the U.S. Army's model, mindset, and tools. With the current political climate and emerging technologies, as well as the 2020 National Defense Authorization Act, U.S. Army Medicine continues to change rapidly.

He emphasized that resources drive all decision making, and each service approaches things a bit differently as they optimize to their unique environments. As Capt. Price mentioned, DHA is creating a more standardized way to view things from a system-wide (instead of a service-wide) perspective. Col. Brennan encouraged the VHA to maintain dialogue with the military health system to exchange lessons learned. Cooke interjected to suggest that DHA be interviewed as part of the VA's upcoming market analysis.

Col. Brennan noted that the U.S. Army's medical properties are diverse, from laboratories to medical centers, and global. MEDCOM deals with local, state, and national governments in various places and has to adapt and change models to accomplish missions in each. MEDCOM uses a Facilities Condition Index (FCI) to rate its buildings. The ratings fall on a scale from Q1 to Q4 and include plant replacement value and deferred maintenance calculations. However, a facility with the highest rating, Q1, could need a substantial investment to maintain accreditation—the FCI is essentially a snapshot in time that does not account for facilities that could age out the following day. Leadership judgment and flexibility are needed to account for these variances in the FCI so that investments are also possible for Q1 and Q2 facilities. He said that decision making is both an art and a science.

MEDCOM's $260 million annual sustainment budget is more than adequate, given the Army's level of efficiency, Col. Brennan noted, and MEDCOM retains a list of capital investment projects that can begin with surplus funding from other projects. In response to a concern about the ability to keep up the funding level at that rate in the future, Col. Brennan explained that all facilities have been replaced, with the exception of one in Hawaii, and the Army has a robust modernization program in which project costs are bundled when it makes sense to do so. In response to a question from O'Keefe, Capt. Price noted that there is approximately $3.5 billion to $4.5 billion in backlog, including sustainment, restoration, and modernization, across DHA. Col. Brennan acknowledged that it is acceptable to have some backlog and that leaders have the resources to prioritize decisions if something affects safety and thus needs to be addressed immediately.

In response to a question from Ambassador Smith, Col. Brennan said that data quality is a concern and a challenge: the information in these systems is only as good as the data that go in and how the systems and the data are maintained. Typically, the data are sufficient for programmatic purposes but not for fine-tuning, especially when things are miscoded. He noted that although resources have been allocated to improve data quality, better human management is also required. In response to a question from Goodman, Col. Brennan emphasized that to improve data quality, policy decisions need to synchronize, people need to be held accountable, and accurate data need to be tied to competing for available resources.

In response to a question from Anselmi, Col. Brennan said that MEDCOM relies on a suite of contracts that are carefully negotiated—for example, nearly all facilities have centralized maintenance contracts. He also noted the value of leveraging the work of the Army Corps of Engineers. With so much hospital facility work outsourced, Yolitz wondered about the impact on readiness. Col. Brennan noted that there is nothing inherently military about the operations and maintenance of a medical facility, so it makes sense to have certified professionals completing certain tasks. Developing expertise for an Army health facility planner to build a hospital does not directly influence staffing models, he explained.

Col. Brennan closed his presentation by discussing remaining challenges: (1) procurement timelines; (2) budget uncertainty; (3) the year-end boom-or-bust cycle; (4) retention of facilities talent in an uncertain and changing environment; (5) dependence on installation support for noncategory 500 (medical)/300 (research) facilities; (6) data quality in an evolving environment; and (7) code/accreditation changes. He reiterated that there is much that the VA can learn from the military and vice versa, owing to the similarities of their missions—although facilities staff do not treat the patients, their work is important to the environment of care in hospitals.

WORK ORDER AND SERVICE CONTRACT MANAGEMENT

Mark Sciarratta, director, Facilities Management, Georgetown University, noted that standardizing and sharing data are two problems faced by all organizations. He built a new model, which bridges and builds reports about facility performance, to improve facility maintenance at Georgetown University. He detailed the institu-

tion's transition from a zone-based maintenance service (i.e., academic, medical, and residential) to a central shop structure (i.e., tenant services, custodial services, and facility operations). The central shop categories under facilities management are derived based on client impact (e.g., tenant services include pest control; custodial services include window cleaning; and facilities operations include fire safety).

The central shop-based maintenance structure encourages accountability, focuses on performance, allows for oversight and mentoring, and targets critical building systems for repair and maintenance. The success of the central shop structure is measured through employee development, client feedback, reduction in failed demand response, and noticeable improvement in the care of facilities and infrastructure. Sciarratta emphasized that *people* are the key to creating a successful program. The central shop structure enables employees to work in their area of expertise and to advance their careers, whereas the zone-based structure led to confusion over duties and had limited opportunities for advancement.

Achievable performance standards should be set (e.g., 5 days to resolve a reported issue), and external systems should be used to push out the data to manage performance. He encouraged the use of Microsoft Access because it is simple to learn, affordable, and can be tailored for various people and projects. He also suggested using a standardized language across the database. In response to a question from Capt. Price about the capacity of Access versus Oracle, Sciarratta said that because the VA is such a large organization, that is a worthwhile consideration. However, he noted that Microsoft Access is easier for the workforce to use, and he has not experienced a limit in terms of capacity. He said that Microsoft Access is a good solution for up to 10-20 locations. In response to a question from Oskvig, Sciarratta explained that demand response charts help to identify when and where additional staff are needed (e.g., during student move-in). Sciarratta commented that work order systems are outstanding tools for modeling the size of the workforce for a particular task, but different requirements will change the hours needed and that information cannot be built into such systems. Instead, building one's own labor algorithms results in higher accuracy to determine staff size and needs. He also highlighted the value of determining metrics for demand calls, which is possible only if work orders are tracked. Reports could then be sent to supervisors and mechanics to follow up and decrease the time it takes to close work orders. He said that the VA could generate similar reports statewide quickly by pushing work order data into the Microsoft Access database. He emphasized the need to build structures that can easily be passed on to someone else to sustain. He reiterated that data in a usable format is the best help in managing a facility, and he encouraged the VA to keep things simple.

Sciarratta said that a combination of internal and contracted workforce builds a robust, highly motivated team and enhances the facility and client experience. In closing, he explained that he would like to build a program to develop maintenance employees for the most suitable jobs. He shared a sample training plan for a building maintenance worker that includes job-specific, career-enhancement, and on-the-job training opportunities over 3 years. In response to a question from Goodman, Alvarez said that the VA does have ways to develop its employees, but that it does not have a formal module similar to Georgetown University's. Yoder mentioned that there are training programs at his site, and Ontto said that similar step programs and individual employee development plans are in place at his site. In response to a question from Goodman, Alvarez noted that while the VA would be interested in running training at the VISN or national level to help with the shortage of tradespeople and to build the internal workforce, it is hard to recruit people if they have to relocate. If certain jobs could be redefined and become more regional in nature, then perhaps the mobility acceptance from staff could change. Referencing the aging workforce in the DHA, Capt. Price said that DHA hired students from a local junior college as part-time employees to fill the void. He also referenced the Pathways programs, which require a 2-year commitment to the federal government.

TRAINING FACILITIES WORKFORCE—FEDERAL BUILDINGS PERSONNEL TRAINING ACT

Brian Gilligan, national program manager, General Services Administration (GSA), opened his presentation with an overview of the competency model, which he hoped could be used to establish consistent training standards and identify national training programs. The Federal Buildings Personnel Training Act (FBPTA) requires (1) core competencies for federal buildings personnel (related to building operations and maintenance, energy management, sustainability, water efficiency, safety, and building performance measures); (2) recommended curriculum and continuing education; (3) annual updates to competencies and curriculum; (4) compliance by all federal buildings personnel (i.e., facility managers, energy managers, and building operators); and (5) a method for contractor compliance.

Gilligan explained that pilot programs at DHA and the VA in Baltimore revealed that it is important

to focus on specific jobs since there is not a consistent set of occupational series and most people filling the roles do not have technical backgrounds. He shared a snapshot of the competency model to demonstrate its breadth. He emphasized that there is no one job where expertise would be expected in all competencies; it is a team effort. The challenge is to understand who in an organization needs to have what responsibilities and what type of training is currently available. He noted that this process is not quite as rigorous as that of the Better Buildings Workforce Guidelines (BBWG); thus, BBWG programs are automatically accredited under the FBPTA.

Gilligan next moved to a discussion of two online tools—FEDSAT (similar to an open-book test) and Accelerate FM (a long-term professional development tracker)—that help agencies understand the requirements of and develop plans for compliance with the FBPTA. FEDSAT identifies and fills basic knowledge gaps by providing an 80-question test that takes a total of 3 hours to complete on any device. If the test taker answers a question incorrectly, he or she is directed to free learning resources. Individuals can use Accelerate FM to assess their competencies and proficiency levels based on a particular position, and they can then find the qualifications they need and enroll in the appropriate courses listed. The Accelerate FM dashboard tracks progress on these required qualifications.

Two non-GSA organizations are currently using the competency model and these two tools (FEDSAT and Accelerate FM): the Social Security Administration and the Department of State's Overseas Building Operations group.

Gilligan explained that training employees to the FBPTA's competency levels could enhance their skill sets, reduce errors, and reduce cost by allowing for more in-house repairs. The competency model also provides incentives for education that could lead to future leadership positions. The FBPTA aligns with agency strategic goals to deliver innovative, quality services. He noted that organizational buy-in is critical: not complying with the act is a liability, and complying with it opens job opportunities.

Anselmi asked about the ability of GSA's program to interface with the American Hospital Association's (AHA's) certification process. Gilligan said that AHA is now included in GSA's list of credentials and is part of the curriculum. He added that any type of training could be reviewed for inclusion on this list. In response to a question from Oskvig, Gilligan noted that while standardized position descriptions are helpful to align to the FBPTA or to develop training programs, they are not critical. Broskey pointed out that if the VA pursued some of these developmental opportunities for competencies, it could simultaneously fulfill VA Mission Act requirements. Gilligan agreed and noted that GSA's approach is less expensive than if the VA tried to solve the problem itself. Oskvig observed that it will be difficult for people to build in more time to develop these pathways, and Anselmi suggested that the VA's energy program could be involved so as not to burden the chief engineers further.

CONCLUDING REMARKS

Oskvig recapped the key topics of the workshop: (1) value and use of CAPRES and work order information; (2) use and value of stakeholder surveys to build relationships; (3) essential skills and positions on the administrative staff at VA medical centers; (4) variety of contracting tools for facility maintenance and operations; (5) opportunities for workforce development and training; (6) use of management reports for efficient facility management and staffing; (7) variances in the assignment and accomplishment of engineering functions; and (8) importance of performance measures and metrics. Alvarez pointed out that all three chief engineers run their services as businesses (i.e., staffing, training, contracting, purchasing). He also observed that there are additional administrative and overhead business burdens for some sites that include fire or housekeeping, for example. The smaller the organization is, the more difficult it is to take on that burden. O'Keefe reiterated that for campuses with multiple sites, such as Yoder's, someone with familiarity and ownership of the systems has to be in charge at each site. She added another illuminating theme of the workshop—the elasticity of contract models—and underscored the important role of the activation coordinator at VA medical centers. Yolitz closed the workshop by emphasizing that effective tools and metrics as well as leadership discretion and management are essential to meeting needs of veterans.

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