



Memorandum from the Office of the Inspector General

September 27, 2023

Brian D. Keeling
Robert Bryan Williams

**REQUEST FOR FINAL ACTION – EVALUATION 2022-17396 – ORGANIZATIONAL
EFFECTIVENESS – POWER SERVICE SHOP**

Attached is the subject final report for your review and final action. Your written comments, which addressed your management decision and actions planned or taken, have been included in the report. Please notify us when final action is complete. In accordance with the Inspector General Act of 1978, as amended, the Office of the Inspector General is required to report to Congress semiannually regarding evaluations that remain unresolved after 6 months from the date of report issuance.

If you have any questions or wish to discuss our findings, please contact Noel K. Kawado, Senior Auditor, at (865) 633-7348 or Lisa H. Hammer, Director, Evaluations – Organizational Effectiveness, at (865) 633-7342. We appreciate the courtesy and cooperation received from your staff during the evaluation.

David P. Wheeler
Assistant Inspector General
(Audits and Evaluations)

NKK:KDS

Attachment

cc (Attachment):

TVA Board of Directors
Megan Andersen
Susan E. Collins
Mary C. Corbitt
Samuel P. Delk
Buddy Eller
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OIG File No. 2022-17396



Office of the Inspector General

Evaluation Report

To the Vice President, Power Service Shop and Regional Maintenance, and to the Senior Vice President, Generation Projects and Fleet Services

ORGANIZATIONAL EFFECTIVENESS – POWER SERVICE SHOP

Evaluation Team
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Evaluation 2022-17396
September 27, 2023

ABBREVIATIONS

CFR	Code of Federal Regulations
CoC	Certificate of Conformance
CR	Condition Report
FY	Fiscal Year
GP&FS	Generation Projects and Fleet Services
ISLA	Internal Service Level Agreement
MRC	Management Review Committee
NRC	Nuclear Regulatory Commission
PO	Power Operations
PPC	Performance and Project Controls
PSS	Power Service Shop
QA	Quality Assurance
QC	Quality Control
TVA	Tennessee Valley Authority

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Evaluation 2022-17396 – Organizational Effectiveness – Power Service Shop

EXECUTIVE SUMMARY

Why the OIG Did This Evaluation

Organizational effectiveness, as defined in this evaluation, is the ability of an organization to achieve its mission and goals. Due to the importance of alignment between strategy, team engagement, and operational performance, the Office of the Inspector General is conducting organizational effectiveness evaluations of business units across the Tennessee Valley Authority (TVA). This evaluation focuses on Power Service Shop (PSS), a business unit under the Generation Projects and Fleet Services organization, which is part of the TVA's Chief Operating Office.

PSS, based in Muscle Shoals, Alabama, provides, among other services, fabrication, equipment and component repair, inspection and refurbishment services for assets within TVA's Nuclear and Power Operations organizations, as well other federal agencies, which include the U.S. Corps of Engineers and U.S. Bureau of Reclamation. The mission of PSS is to "provide a competitive advantage to TVA by performing repair and refurbishment services, using flexible, economical, and safe solutions," with a focus on safety, quality, reliability, and customer satisfaction. The objective of this evaluation was to identify factors that could impact PSS's organizational effectiveness.

What the OIG Found

During our evaluation, PSS personnel commented positively on interactions within and outside of PSS and the safety environment. However, we identified issues that could negatively impact PSS's effectiveness, if not addressed. These issues include (1) staffing challenges; (2) resource concerns related to tooling, tools, equipment, and trailers; and (3) communication with business partners. PSS is taking actions to address some of these concerns. We also identified risks to the independence of PSS's Quality Control inspectors performing work on nuclear related components.

What the OIG Recommends

We recommend the Vice President, Power Service Shop and Regional Maintenance, address or continue to address (1) staffing challenges; (2) resource concerns related to tooling, tools, equipment, and trailers; and (3) concerns related to business partner communication.

We recommend the Senior Vice President, Generation Projects and Fleet Services, in coordination with the Chief Nuclear Officer, mitigate the risks to Quality Control inspector independence.



Evaluation 2022-17396 – Organizational Effectiveness – Power Service Shop

EXECUTIVE SUMMARY

TVA Management's Comments

TVA management agreed with our recommendations and provided actions taken and planned, including increasing staffing and resource funding, centralizing support functions, and developing a Quality Assurance Bulletin to communicate Quality Control inspector roles and responsibilities. See Appendix B for TVA management's complete response.

Auditor's Comments

We agree with TVA management's actions taken and planned in response to our recommendations.

BACKGROUND

Organizational effectiveness, as defined in this evaluation, is the ability of an organization to achieve its mission and goals. Due to the importance of alignment between strategy, team engagement, and operational performance, the Office of the Inspector General is conducting organizational effectiveness evaluations of business units across the Tennessee Valley Authority (TVA). This evaluation focuses on Power Service Shop (PSS), a business unit under the Generation Projects and Fleet Services organization (GP&FS), which is part of TVA's Chief Operating Office.

PSS, based in Muscle Shoals, Alabama, provides, among other services, fabrication, equipment and component repair, inspection and refurbishment services for assets within TVA's Nuclear and Power Operations (PO) organizations, as well other federal agencies, which include the U.S. Corps of Engineers and U.S. Bureau of Reclamation. The mission of PSS is to "provide a competitive advantage to TVA by performing repair and refurbishment services, using flexible, economical, and safe solutions," with a focus on safety, quality, reliability, and customer satisfaction.

During fiscal year (FY) 2015, PSS underwent changes that included an internal reorganization, a revised business model, voluntary and involuntary reductions in staff, and other cost reduction efforts, all of which were driven by the need to demonstrate PSS's overall value to TVA and its ratepayers. An additional focus was to reduce the excessive number of safety incidents PSS was experiencing. The end goal was to create an organization that had a sustainable platform for the future. Metrics tracked by PSS indicate that demand for PSS's services appears to be trending upwards, based on direct man-hours worked from FY 2019 through FY 2022 and estimated work turned down in terms of direct man-hours from FY 2020 through June 2023.

To help achieve its mission, PSS is made up of the following six departments:

- Shop Operations provides full-service breaker refurbishment, in-shop mechanical and electrical repairs for large and small components, field machining for turbine outages, field repair/rewind of electrical rotating components and fabrication services for equipment such as spillway and intake gates, precipitator hoppers, and mooring bits. This department also performs refurbishment and repair work on nuclear components, including nuclear-grade motors, rotating components (such as fans and gearboxes), internal turbine and generator components, and breakers.
- Turbine Generator Field Services is responsible for managing field operation activities associated with turbine-generator outages and related support activities at fossil and gas plants. Specific activities include major turbine inspections, and major refurbishment on turbine rotors and valves, exciters, bearings, oil seals, and generator rotors.

- Hydro Field Services provides, among other services, turnkey turbine assistance, wicket gate adjustments, laser shaft and plumb alignments, and electrical, turbine, and generator upgrades for hydro units. Scopes of work include both routine outage and Hydro Life Extension projects.
- Field Plant Services offers non-nuclear field services including those related to dam safety, plant project support, and modification support. In addition, this department provides assistance with implementation of projects, such as civil projects and plant or equipment upgrades, and offers diving services for underwater work.
- The Support and New Programs department's responsibilities include supporting strategic and operational planning for PSS, providing engineering technical support related to PSS work, and ownership of PSS's corrective action program. This group also owns the nuclear quality assurance (QA) program related to work falling under the requirements of Title 10, Code of Federal Regulations (CFR), Part 50, Appendix B, *Quality Assurance Criteria for Nuclear Power Plants and Fuel Reprocessing Plants* (10 CFR 50, Appendix B).
- Transformer Services personnel are responsible for repairing transformers, bushings, and other distribution electrical equipment along with on-site oil purification utilizing mobile equipment. This department is also responsible for performing crane and elevator inspections.

Since October 1, 2017, PSS has utilized an internal service level agreement (ISLA) to govern the work with Nuclear and PO (defined as "Generation" within the ISLA). Specifically, the ISLA commits Generation to utilize core services,¹ with the intent that during each business planning cycle, PSS will coordinate and facilitate a discussion with Generation to identify key work scopes that PSS has the skills and capacity to competitively perform. Other work requested by Generation is referred to as supplemental services, which include, but are not limited to, field motor services, field breaker services, and field removal/installation of other rotating components.

Generation is responsible for providing the detailed work scope, which PSS uses to prepare cost estimates of the work. If PSS is unable to perform core work either because of its inability to meet the timeframe or insufficient capacity and technical resources, Generation is allowed to pursue other options. In such cases, Generation is required to complete an exception form to be signed by a PSS manager, which allows Generation, in conjunction with Supply Chain, to pursue other options.

¹ Core services are defined as scopes of work that PSS has the resource capacity, specialized tooling, technical skills, and efficient processes to deliver high quality and competitive services. Examples of core services include machining services, motor refurbishment and repair, breaker services, turbine and generator outage support, and crane and elevator inspection services.

As of December 12, 2022, PSS consisted of 233 full-time personnel, including 200 employees, 6 departmental managers, the PSS general manager,² and 26 individuals performing supervisory roles. In addition, PSS had 531 contractors performing staff augmented or managed task work that assist PSS in achieving its mission.

OBJECTIVE, SCOPE, AND METHODOLOGY

The objective of this evaluation was to identify factors that could impact PSS's organizational effectiveness. We assessed operations from FY 2019 through July 2023, and culture at the time of our interviews with PSS personnel, which occurred between December 12, 2022, and April 24, 2023. To complete the evaluation, we:

- Reviewed GP&FS's FY 2023 through FY 2027 business plan and TVA's FY 2023 through FY 2027 business plan documentation to obtain an understanding of risks and initiatives within PSS.
- Reviewed select PSS process assurance and quality assurance procedures, including PSS Process Assurance Procedure 03.05, *PSS Conduct of Operations*, and PSS Quality Assurance (QA) Procedure 01.00, *Organization and Quality Program*, to determine PSS roles and responsibilities.
- Reviewed TVA's Nuclear QA Plan and 10 CFR Part 50, Appendix B, *Quality Assurance Criteria for Nuclear Power Plants and Fuel Reprocessing Plants*, to obtain an understanding of regulatory requirements for work related to nuclear quality and safety.³
- Reviewed the PSS ISLA to gain an understanding of the obligations of PSS, Nuclear, and PO related to core and supplemental work performed by PSS.
- Reviewed PSS performance data for FY 2019 through June 2023 to trend metrics related to rework dollars, direct man hours by work type and generation category, and estimated work turned down in terms of direct man-hours.
- Conducted interviews with 197 employees and 32 managers,⁴ including the PSS General Manager, and analyzed the results to identify factors that could affect organizational effectiveness.

² During July 2023, the PSS general manager was promoted to vice president, Power Service Shop and Regional Maintenance. We refer to this individual as the PSS general manager throughout the body of the report.

³ Safety related components are defined as items necessary to ensure (1) the integrity of the reactor coolant pressure boundary, (2) capability to shut down the reactor and maintain it in a safe condition, and (3) capability to prevent or mitigate the consequences of accidents. Quality related components encompass a broad class of plant features that contribute to the safe operation and protection of the public.

⁴ We did not interview five individuals because they (1) were on a leave of absence or (2) had recently retired. We also interviewed one individual who was not reflected on the December 12, 2022, headcount but was hired into PSS shortly thereafter.

- Conducted interviews with six contractors and analyzed results to identify factors that could affect organizational effectiveness.
- Conducted interviews and/or obtained information from staff who support PSS in various areas, including representatives from Human Resources, Labor and Employment Relations, Supply Chain, and GP&FS.
- Surveyed and/or interviewed a nonstatistical sample of 80 individuals from other TVA organizations and external federal entities that work with PSS personnel and analyzed results to identify factors affecting organizational effectiveness from a business partner perspective.
- Reviewed staffing for PSS from FY 2020 through FY 2022 and overtime data from FY 2020 through July 15, 2023, to determine trends.
- Reviewed relevant condition reports⁵ (CR) from Maximo and work packages from TVA's Enterprise Content Management system to obtain detailed information on PSS work related to nuclear quality and safety.
- Reviewed TVA values and competencies (see Appendix A) for an understanding of cultural factors deemed important to TVA.

This evaluation was conducted in accordance with the Council of the Inspectors General on Integrity and Efficiency's *Quality Standards for Inspection and Evaluation*.

OBSERVATIONS

During our evaluation, PSS personnel commented positively on interactions within and outside of PSS and the safety environment. However, we identified issues related to (1) staffing, (2) resources, and (3) communication with business partners that could negatively impact PSS's effectiveness, if not addressed. PSS is currently taking actions related to some of these concerns. We also identified risks to the independence of PSS's Quality Control (QC) inspectors performing work on nuclear related components.

POSITIVE INTERACTIONS WITHIN AND OUTSIDE OF PSS

Of 220 individuals (management and employees) that provided an opinion, 207 individuals (94 percent) expressed positive comments about their interactions with management, including supervisors, managers, and/or the PSS general manager. Examples of positive comments included management being supportive, knowledgeable, and trusting of employees. Several individuals also provided specific positive comments about the PSS general manager, which included being the best general manager PSS has had, being accessible, being a strong leader, and having a positive impact on PSS.

⁵ A condition report is a computer generated or paper form used to document evaluation and resolution of issues

In addition, 188 of the 197 employees (95 percent) we interviewed commented positively on interactions with others in their group. Examples of positive interactions included individuals working well together and/or as a team, having close or family-like relationships, and being helpful or supportive of each other. When asked about interactions with other departments within PSS, 164 of 176 individuals (93 percent) that expressed an opinion also provided positive comments. Several individuals also provided positive comments about the PSS work environment, the work PSS accomplishes, or their pride in being able to serve the citizens of the Valley.

Of the 183 individuals (management and employees) who provided feedback, 155 (85 percent) also commented positively on interactions with business partners. In addition, we obtained feedback from PSS business partners, which included 80 individuals from business units outside of PSS and external federal entities to determine their opinions related to PSS's products and services, quality of feedback and communication, and timeliness. While business partners generally rated PSS high, they also identified areas for improvement, as later discussed.

SAFETY ENVIRONMENT AT PSS

Because of the work PSS performs, the safety environment plays a critical role in PSS's ability to be effective. When asked about safety at PSS, 170 of 188 employees (90 percent) that provided an opinion expressed positive comments in this area. Specifically, several employees indicated their perception that either safety is important or a priority, management is supportive of a safe work place, or that employees will stop work when they feel unsafe or unsure about the work.

In addition to its Health and Safety Committee,⁶ we noted that PSS has two safety programs in place designed to strengthen the safety of PSS personnel – the Cornerstone Program and the Pin Program. Developed by PSS employees, the Cornerstone program's aim is to address employee knowledge gaps that affect safe work execution through training. Several gaps have been identified, including hazard recognition, line of fire (being in harm's way), and material handling. According to information from PSS, as of November 2022, 55 new employees have been through the program, 45 have graduated, and the number of injuries and first aids have decreased since pilot training began in July 2022. In 2023, the Cornerstone Program won the TVA Innovation in Safety award. The Pin Program was launched in FY 2021 in response to PSS identifying needed improvements in the quality of observations⁷ performed. As part of this program, pins are awarded to individuals who submit high-quality observations that focus

⁶ PSS's Health and Safety committee responsibilities include reviewing observations data and implementing actions to address trends, tracking of safety goals/actions, monitoring safety-related findings, and reviewing and responding to safety suggestions.

⁷ TVA Technical Safety Procedure 18.221, *TVA Observation Program*, requires individuals in operational business units to conduct safety observations in the workplace.

on TVA's four vital safety behaviors,⁸ which can be redeemed for awards such as travel mugs, apparel, or coolers.

STAFFING CHALLENGES

PSS relies heavily on its workforce, including contractors, to meet its mission. During our review, 102 of 229 employees and managers (45 percent) we interviewed expressed concerns related to staffing challenges, including lack of adequate staffing levels, needed improvements in employee knowledge/experience and skillsets, and/or issues related to contractor staffing.

- Lack of Adequate Staffing – Fifty-nine of the one hundred two individuals (58 percent) expressed specific concerns related to inadequate staffing levels. Some of these individuals mentioned their perception that PSS does not hire when individuals retire, that positions are not filled, or that individuals are leaving because of outside competition. In addition, several individuals that expressed inadequate staffing concerns also indicated their concerns with heavy workload, excessive travel, and/or lack of work-life balance. Many of these individuals indicated these factors were negatively impacting the group's morale. Specific examples shared included having to work long durations of time without being able to take time off, being in travel status a lot and traveling for over 300 days during the year. A couple of individuals recognized that management had made efforts to hire more employees, although their perception was that more staffing was needed.
- Knowledge/Experience and Skillsets Concerns – Thirty-seven of the one hundred two individuals (36 percent) indicated issues related to lack of knowledge, experience, and/or skillsets. Specifically, several individuals indicated there is a lack of specialized craft, such as machinists, or a need for more skilled, experienced, or qualified personnel. In addition, some individuals discussed the need for more specialized training, or transferring existing knowledge from more senior personnel to newer employees to avoid or reduce potential future skillset issues. Nineteen of eighty business partners also expressed concerns with the qualifications/skillset/experience of PSS individuals.
- Contractor Staffing Concerns – Twenty-six of the one hundred two individuals (25 percent) expressed concerns related to contractor staffing and/or retention, with several indicating that an increase in pay/benefits could alleviate competition for contractor staffing with other companies. In addition, some individuals indicated concerns with contractors' ability to become annual employees, which could potentially be an avenue to retain knowledge and skills of long-term contractors.

⁸ These include (1) identifying hazards before every task, (2) taking actions to remove hazards and reduce risk, (3) protecting yourself and others and intervening when necessary, and (4) taking pride in safety and being involved.

We noted that total staffing increased from 211 to 231, or 9 percent, between September 30, 2020, and September 30, 2022. However, overtime hours increased from 86,707 hours to 122,111 (41 percent) from FY 2020 through FY 2022, and during the period October 1, 2022, through July 15, 2023, overtime hours totaled almost 125,000 hours.

Individuals provided examples of the impacts of these staffing challenges, including having to put work on hold or turn down customer work requests and difficulties in meeting customer needs. Several business partners echoed the concerns shared by PSS individuals. Specifically, 17 of 80 business partners indicated concerns with lack of manpower, with a few expressing concerns with PSS's availability to do work when needed. PSS metrics indicate an increased workload, with PSS's direct man-hours worked increasing from approximately 1.21 million hours in FY 2019 to about 1.36 million hours in FY 2022 (13 percent). In addition, estimated work hours turned down for core services due to resource availability issues increased from 23,435 hours in FY 2020 to 63,170 hours, through June 30, 2023, of FY 2023 (270 percent).

Data suggests that availability of craft labor resources will be an issue over the next several years. TVA utilizes data from the Industrial Information Resources Database to show demand for craft labor affecting the Tennessee Valley region. Data we reviewed indicated there were more than 1,000 external projects, active and scheduled to start in calendar years 2023 and 2024, of \$10 million or greater, which will compete with TVA for craft labor. In addition, a review of internal supply and demand data for key PSS roles during FY 2023 through FY 2028 indicates TVA will encounter shortages in supply of electricians, ironworkers, machinists, and pipefitters during that timeframe. These labor pressures could exacerbate some of the staffing issues previously described, as competition for skilled personnel with external entities increases.

LACK OF RESOURCES

Forty-three of the two hundred and twenty-nine individuals (19 percent) we interviewed indicated concerns with resources needed to complete their job responsibilities, including tooling, tools, equipment, and trailers. Many individuals expressed issues with the lack of or availability of tools/equipment, outdated or inferior tools/equipment, and/or delays in getting tooling from PSS's tooling supplier. Some other individuals recognized that PSS management has been making efforts to obtain new equipment or upgrade existing equipment. Finally, a few individuals expressed concerns with the availability of or outdated mobile trailers used while on-site at generating plants. Some of these concerns were reflected in the FY 2023 through FY 2027 GP&FS business plan, which identified a risk of lack of base capital funding that compromises PSS's ability to successfully execute work.

During our review, we noted that PSS is planning to make an investment in equipment. Specifically, based on information provided by PSS management, PSS has plans to purchase and install a vertical mill to increase PSS's drilling,

milling, and machining capability and capacity for both internal TVA and external markets. According to management, the mill or vertical turning lathe, which will cost approximately \$30 million, will allow PSS to work on additional components such as main river hydro head covers and shift rings, nuclear steam path components, federal interagency external hydro rehab projects, and nonfederal hydro components. During a meeting in July 2023, GP&FS management also indicated that PSS had a \$1 million increase in their capital budget.

BUSINESS PARTNER COMMUNICATION COULD BE IMPROVED

Twenty-seven of eighty business partners (34 percent) indicated concerns with communication, including the need for more communication related to services PSS provides, the status of work, the budget, and changes to the schedule. Based on information provided by GP&FS's Performance and Project Controls (PPC),⁹ continuous improvement efforts that are currently underway may help alleviate some of these business partner concerns. According to PPC, migration of a PSS cost tool from Microsoft Excel to Microsoft Power Platform will provide new options for customers and stakeholders and may address some concerns about the lack of cost detail and analysis. According to PPC, the cost tool is expected to be considered live heading into September 2023. In addition, PPC stated that a PSS Work Request and Authorization Database is being developed that allows customers to request job support, get estimates, sign work authorizations, and approve change orders. PPC indicated that this database will help ensure all parties are using the same information and allow for timely change control. According to PSS management, as of August 2023, development of the database project is 85% complete with a planned go-live for the spring 2024 outage season.

RISKS RELATED TO PSS INSPECTOR INDEPENDENCE

PSS provides a variety of services to TVA, including TVA's nuclear fleet. Nuclear-related services include work on components that are deemed nuclear safety or quality related. As such, PSS is required to have a QA program as described in 10 CFR 50, Appendix B, *Quality Assurance Criteria for Nuclear Power Plants and Fuel Reprocessing Plants*. The QA program is responsible to verify (1) work affecting safety-related nuclear components has been correctly performed and (2) that those components perform satisfactorily in service. In addition, 10 CFR 50, Appendix B, states QA includes QC functions, which provide a way to control the quality of the material, structure, component, or system to predetermined requirements in order to provide those assurances. Interviews and documentation review indicate risks to PSS Nuclear QA personnel independence.

⁹ This group provides PSS with project controls specialist support related to cost and schedule reporting.

Schedule and Quality Concerns

During interviews, it was indicated that a PSS QC inspector felt pressured to accept incorrect work, and that QC as a whole was under pressure due to time and workflow constraints. Due to the nature of the concern, we interviewed several PSS QC inspectors in order to obtain further information. During those interviews, one inspector provided an example of PSS craft verbally expressing that an inspector was slowing down production, while another indicated the perception by PSS craft is inspectors hold up PSS' schedule. Further, both inspectors indicated they either have received pushback on work from, or been rushed by, craft personnel, or have been overridden when there was a disagreement with the quality of work performed.

As described by these inspectors, when craft personnel and the inspectors disagree on if work meets required criteria, a CR is written. PSS Engineering then develops a solution and the issue goes before PSS's Management Review Committee¹⁰ (MRC) for review and approval, without input on the solution from the QC inspector. A couple of inspectors indicated that they will sign off on the solution and/or action to resolve the QC issue after it has been approved by the MRC, even when they do not agree with it. However, signing off without agreeing appears to be in conflict with 10 CFR 50, Appendix B, which states the quality assurance function includes verifying that activities affecting the safety-related functions have been correctly performed.

We performed a search of CRs specific to nuclear safety or quality related work occurring between October 2017 and March 2023 and identified seven CRs that indicated an issue with nuclear safety/quality related work or material and were initiated by PSS QC inspectors. We provided some of these examples to the QC inspectors who indicated they concurred with the resolution of those specific CRs. Therefore, it remained unclear as to what examples the inspectors were referring to when indicating they would sign off solutions and/or actions they did not agree with. However, there is a risk that QC inspectors are concurring with work they are not comfortable with based on their description of how disagreements are resolved and their indication that they will sign off on work even if they do not agree with it.

Organizational Structure Concerns

According to 10 CFR 50, Appendix B, those performing QA functions should report to a management level that provides the required authority and organizational freedom, which includes independence from cost and schedule. PSS QC inspectors ultimately report to the PSS general manager, who, in accordance with the job duties, has a vested interest in the cost and schedule aspect of PSS's production. Further, we noted that PSS Nuclear QA supervision has goals related to budget and schedule, specific to financial performance for capital and operating and maintenance outages. The organizational structure of PSS QC along with the budget and schedule related goals of the PSS Nuclear

¹⁰ PSS's MRC consists of the PSS senior management team and the Supervisor of PSS' Nuclear QA program.

QA supervisor and PSS general manager may exacerbate the risk to QC inspector independence.

Document Approval Concerns

When reviewing one of the work packages associated with the CRs, we observed that the same inspector who performed the inspection work signed the Certificate of Conformance (CoC). The CoC certifies that the work was performed in accordance with the technical requirements provided by the site as well as 10 CFR 50, Appendix B. According to interviews with a couple of inspectors, it is common practice at PSS for inspectors who perform the inspections to sign the CoC at the direction of the PSS Nuclear QA supervisor. However, we reviewed Nuclear Regulatory Commission (NRC) documentation and noted that the NRC issued a nonconformance to another QA organization based on a similar practice.¹¹

CONCLUSION

TVA relies on PSS to help achieve its mission through the repair, refurbishment, inspection, and fabrication services it provides to TVA's generating units. Based on interviews, (1) positive interactions between PSS employees, management, and business partners and (2) a strong safety environment are factors contributing to an effective organization. However, challenges were identified related to inadequate staffing and employee knowledge, as well as lack of resource concerns. In addition, risks to independence were identified related to PSS QC inspectors performing work on nuclear components. These concerns, if not addressed, could hinder PSS's organizational effectiveness, and may be an impediment to PSS's ability to be an effective contributor to TVA's mission of providing highly reliable electricity at the lowest feasible rate.

RECOMMENDATIONS

We recommend the Vice President, Power Service Shop and Regional Maintenance, address or continue to address:

1. Staffing challenges.

TVA Management's Comments – TVA management agreed with the recommendation and stated that PSS plans to add 53 annual positions, including field crews and corresponding support staff, in FY 2024. In addition, management will continue to focus on developing specialized craft through apprenticeship programs and recently developed a Qualification Matrix to ensure adequate skills are transferred to apprentices throughout their training program. Further, management has earmarked funding in FY 2024 for

¹¹ In NRC Inspection Report No. 99900345/2018-201, Notice of Nonconformance, dated September 11, 2018, the NRC indicated that the individual who performed the inspection and subsequently signed the CoC was not independent of the work being inspected, which is contrary to the requirements of 10 CFR 50, Appendix B.

specialty training. See Appendix B for TVA management's complete response.

Auditor's Response – We agree with TVA management's planned actions.

2. Resource concerns related to tooling, tools, equipment, and trailers.

TVA Management's Comments – TVA Management agreed with the recommendation and stated they are continuing to make investments in tooling/equipment and capital assets through increased annual spending, including an additional \$1 million in base capital funding for FY 2024. In addition, management stated they have developed an approval form that will provide enhanced reporting to better communicate request status and spend levels for operations and maintenance. See Appendix B for TVA management's complete response.

Auditor's Response – We agree with TVA management's actions planned and taken.

3. Concerns related to business partner communication.

TVA Management's Comments – TVA Management agreed with the recommendation and stated the multiple initiatives described in this report are currently underway to provide more transparency in estimating, cost, and schedule. After these initiatives have been implemented, PSS will conduct customer surveys and site visits to measure improvements in communication. Management also stated that support functions are in the process of being centralized to provide a uniform approach in customer communications. See Appendix B for TVA management's complete response.

Auditor's Response – We agree with TVA management's actions planned and taken.

4. We recommend the Senior Vice President, GP&FS, in coordination with the Chief Nuclear Officer, mitigate the risks to QC inspector independence.

TVA Management's Comments – TVA management agreed with the recommendation and stated support functions, including the PSS Nuclear Assurance Program and Quality Control Inspectors are in the process of being centralized. Under this centralization, support functions will no longer report to the General Manager of PSS, and Quality Control Inspectors will no longer be directly aligned to the same General Manager overseeing operational functions or craft personnel performing work. PSS is also recommending a joint team comprised of PSS, Nuclear, and Central Labs and Services personnel to review the organizational structure and ensure the 10 CFR 50, Appendix B, organizational freedom requirements for QA functions are being met. In addition, PSS will issue a Quality Assurance Bulletin with a required read and sign to clearly communicate the roles and

responsibilities of QC Inspectors along with 10 CFR 50, Appendix B, requirements regarding QC Inspector independence. See Appendix B for TVA management's complete response.

Auditor's Response – We agree with TVA management's planned actions.

TVA Values	
Safety	We are uncompromising in our commitment to the safety and well-being of our teammates and the communities we serve.
Integrity	We are honest and straightforward, always doing the right thing with integrity.
Inclusion	We treat everyone with dignity and respect – emphasizing inclusion by welcoming each person’s individuality so we can reach our potential.
Service	We are proud to be of service in the communities in which we live, work, and play.

TVA Leadership Competencies

- Accountability and Driving for Results
- Continuous Improvement
- Leveraging Diversity
- Adaptability
- Effective Communication
- Leadership Courage
- Vision, Innovation, and Strategic Execution
- Business Acumen
- Building Organizational Talent
- Inspiring Trust and Engagement



Tennessee Valley Authority, 1101 Market Street, Chattanooga, Tennessee 37402-2801

David P. Wheeler
Assistant Inspector General (Audits and Evaluations)
Office of the Inspector General

September 18, 2023

RE: REQUEST FOR COMMENTS – DRAFT EVALUATION 2022-17396 – ORGANIZATIONAL EFFECTIVENESS – POWER SERVICE SHOP

Dear Mr. Wheeler,

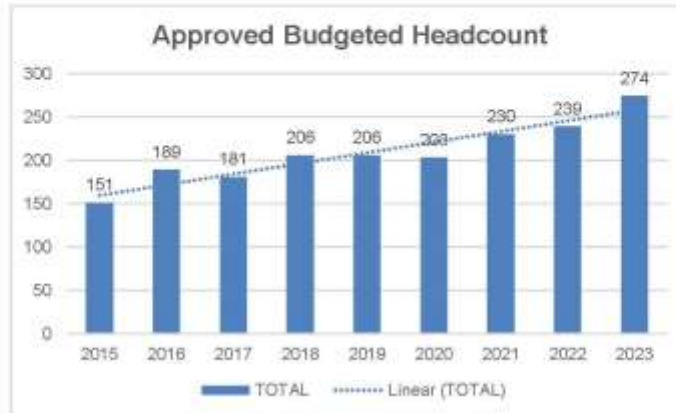
The Power Service Shops (PSS) team would like to thank the Office of the Inspector General (OIG), specifically Lisa Hammer, Noel Kawado, and Justin Franklin, for their time and support in assessing the effectiveness of our organization. The audit team was extremely professional, thorough, and responsive throughout the audit process. The recommendations provided in the report are aligned with and support current initiatives already in place to ensure PSS is effectively supporting TVA's mission.

The PSS leadership team has reviewed your draft memorandum dated August 30, 2023, and would like to provide the following responses to recommendations.

Recommendations

- Staffing Challenges** – We recommend the Vice President, Power Service Shop and Regional Maintenance, address or continue to address staffing challenges. During our review, 102 of 229 employees and managers (45 percent) we interviewed expressed concerns related to staffing challenges, including lack of adequate staffing levels, needed improvements in employee knowledge/experience and skillsets, and/or issues related to contractor staffing.

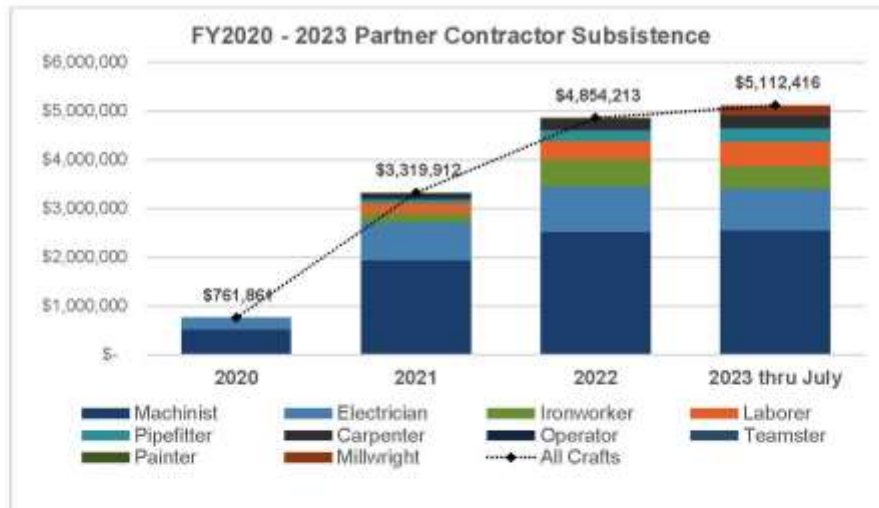
PSS agrees with this recommendation. Over the past 8 years, PSS has continued to refine its business model to ensure we are providing the best value for TVA. This included the implementation of an Internal Service Level Agreement (ISLA) in 2017 as well as ensuring the alignment of resources to meet the needs of the fleet. As shown in the chart below, PSS has continued to steadily increase annual headcount with 123 annual positions being added since 2015.



As PSS continues into FY24, PSS Expansion Initiatives will add an additional 53 annual positions (pending final budget approval), which includes the addition of field crews and corresponding support staff.

In order to address needed improvements in employee knowledge / experience and skillsets, PSS plans to implement multiple initiatives. PSS continues to focus on developing specialized craft through the utilization of apprenticeship programs. For example, PSS is a strong partner in the Machinist Apprenticeship Program, which continues to be a pipeline for developing skilled labor. PSS will continue to provide programmatic support, such as securing components through investment recovery to be used for training purposes. PSS has recently developed a Qualification Matrix to ensure adequate skills are transferred to apprentices throughout their training program. This will be implemented and tracked beginning in FY24. In addition to the continued growth of the apprenticeship program, PSS has earmarked funding in FY24 (pending final budget approval) for specialty training, such as GE Gas Turbine Maintenance Training.

An additional staffing area of concern was related to contractor staffing pay and retention. PSS continues to coordinate with the TVA Labor Council to ensure competitive market pay for hourly employees. Since the establishment of Labor Relations Supplement 70 (LRS-70), PSS has made multiple addendums to ensure fair compensation, such as the addition of 95% subsistence for hourly PSS augmented employees. Below is a graph to show the impact of the addition of subsistence pay.



PSS is currently reviewing data provided by the International Association of Machinists regarding a proposed increase in augmented pay for machinists. PSS is reviewing the financial impact of this proposed increase to the benchmarked PSS 'All in Rate' and will provide a response and recommendation to Labor Relations and the TVA Labor Council in November 2023 prior to wage negotiations for 2024.

In summary, PSS agrees with the OIG recommendations concerning staffing and will continue to implement the aforementioned actions to address the concerns.

2. Lack of Resources – We recommend the Vice President, Power Service Shop and Regional Maintenance, address or continue to address resource concerns related to tooling, tools, equipment, and trailers.

PSS agrees with this recommendation. As discussed in your findings, PSS continues to make investments in tooling and equipment. PSS continues to steadily increase total spend in tooling / equipment with spend in FY21 being \$1.7M, \$2.1M in FY22, and \$2.4M through August FY23.

PSS reviews available funding through monthly financial meetings to ensure appropriate prioritization of funds. Safety equipment and tooling is always given first priority, which is tracked via the utilization of safety workorders. In order to improve the tracking and prioritization of available spend, PSS has developed an approval form via Power Apps. This application will ensure all submittals are reviewed and prioritized by the PSS leadership team. This application will also allow for enhanced reporting in order to better communicate request status and spend levels, which can be shared with employees for full transparency of O&M spend. This tool will be fully implemented in October 2023 for FY24.

In addition to O&M expenditures, PSS has continued to make increased capital investments. PSS secured flex spending over the past several years which allowed for additional investments above and beyond our allocated \$1M capital job order budget. Examples of these additional flex investments included a Faro Tracker, Mazak Mega Turn VTL, Mazak Slant Turn Lathe, 3D Printer, Forklift, Band Saw, trailers, etc. The chart below reflects capital spend over the past 5 years. For FY23, base capital flex spending was not available at the TVA level.



For FY24, PSS has secured an additional \$1M in base capital funding (pending final budget approval), which will allow for a total PSS capital budget of \$2M. Similar to O&M spend, PSS has developed a Power App for capital project tracking and prioritization of capital job order funding. This will also allow for improved reporting and communication to employees regarding capital investments. This tool will be fully implemented in October 2023 for FY24.

Also, as mentioned in the report, PSS is currently implementing a \$30M capital project to increase shop machining capabilities and capacity through the addition of a large vertical turn lathe. Along with this project, PSS is implementing a project to replace antiquated controls and components on an existing large horizontal lathe. This project is forecasted at \$1.8M and will be completed in FY24. Both projects are approved in addition to our capital job order budget.

Additional concerns were expressed regarding tooling acquired from Industrial Tool Services. PSS will share this information with the Industrial Tool Services leadership team along with a list of Condition Reports written by PSS regarding tooling damage or issues over the past 3 years.

3. Concerns related to business partner communication – *We recommend the Vice President, Power Service Shop and Regional Maintenance, address or continue to address concerns related to business partner communication.*

PSS agrees with this recommendation. As discussed in your findings, multiple continuous improvement initiatives are underway to provide more transparency in the reporting of estimating, cost, and schedule. After the implementation of these initiatives, PSS will follow-up with a customer survey and site visits to measure improved communication. PSS will tentatively plan to perform these surveys in Summer 2024 after the implementation of the continuous improvement initiatives.

In addition, the support functions for PSS are currently in the process of being centralized, which will include the planning and PCS functions. This centralization will provide a more uniform approach in customer communications. PSS plans to have this structure in place by January 2024 pending final budget and human resources approval.

4. Risks related to PSS inspector independence – *We recommend the Senior Vice President, Generation Projects and Fleet Services, in coordination with the Chief Nuclear Officer, mitigate the risks to Quality Control inspector independence.*

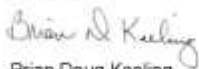
PSS agrees with this recommendation. PSS is currently in the process of centralizing support functions, which will include the PSS Nuclear Assurance Program and Quality Control Inspectors. Under this centralization, support functions will no longer report to the General Manager of PSS. Through this organizational change, Quality Control Inspectors will no longer be directly aligned to the same General Manager overseeing operational functions / craft personnel performing work.

Additionally, beginning in FY 2017, the Quality Control Inspectors were transferred from the Central Labs organization to the Power Service Shops. Prior to this date, the Quality Control Inspectors were organizationally removed from the Power Service Shops. PSS recommends a joint team (PSS, Nuclear, Central Labs and Services) review the organization structure to ensure 10 CFR 50, Appendix B requirements are being met regarding organizational freedom for QA functions. PSS proposes this team provide a report and recommendations by Summer 2024.

PSS will also issue a Quality Assurance Bulletin with a required read and sign to clearly communicate roles and responsibilities of QC Inspectors along with 10 CFR 50, Appendix B requirements regarding independence of QC Inspectors. This will be developed and issued in November 2023 or sooner following publication of this Organizational Effectiveness Report.

In summary, on behalf of PSS, I thank you again for the work of the audit team, and we appreciate the opportunity to review the findings and provide feedback on the draft report.

Sincerely,



Brian Doug Keeling
Vice President
Power Service Shops and Regional Maintenance

KBH
Attachment
cc. see page 5

cc (Attachment):
Robert Bryan Williams
Megan Andersen
Susan E. Collins
Mary C. Corbett
Samuel P. Delk
Megan T. Flynn
David B. Fountain
Tracy E. Hightower
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