

# National Nuclear Security Administration: Update on Actions to Manage Production Challenges at the Kansas City Site

GAO-24-105858

Q&A Report to the Committee on Armed Services, United States Senate

November 16, 2023

## Why This Matters

Nonnuclear parts and components make up over 80 percent of the items in a nuclear weapon. The Kansas City National Security Campus (Kansas City site) in Missouri—managed and operated by a contractor—procures or produces most of these parts under the oversight of the National Nuclear Security Administration (NNSA), a separately organized agency within the Department of Energy (DOE).

In 2019, we reported on management challenges in meeting the forecasted workload at the Kansas City site for known future production requirements.<sup>1</sup> These management challenges included ensuring that the site had (1) sufficient production and administrative office space, (2) a sufficient workforce, (3) up-to-date production equipment, and (4) capable and reliable external suppliers. We also reported on the actions and strategies identified by NNSA officials and contractor representatives at the time to mitigate the effects of each of these management challenges.

A Senate committee report accompanying a bill for the National Defense Authorization Act for Fiscal Year 2022 includes a provision for us to reevaluate the progress of the NNSA and the Kansas City site toward addressing identified risks in production and office space, employee hiring, equipment, external suppliers, and quality assurance practices.<sup>2</sup> This report presents information on each of these issues.

## Key Takeaways

- The Kansas City site's current workload demands exceed the site's nominal capacity and may continue to increase over the next two decades, based on NNSA's current program requirements and projections.
- The Kansas City site has taken actions to address the need for additional production and office space created by its workload demands as well as to address challenges related to its workforce, equipment, external suppliers, and quality assurance practices, resulting in some efficiency gains at the site.
- The Kansas City site may still face challenges in meeting projected workload demands in the following areas: obtaining a sufficient amount of production and office space, ensuring a sufficient contractor workforce, and maintaining a sufficient number of external suppliers.

## What is the Kansas City site's role in the nuclear security enterprise?

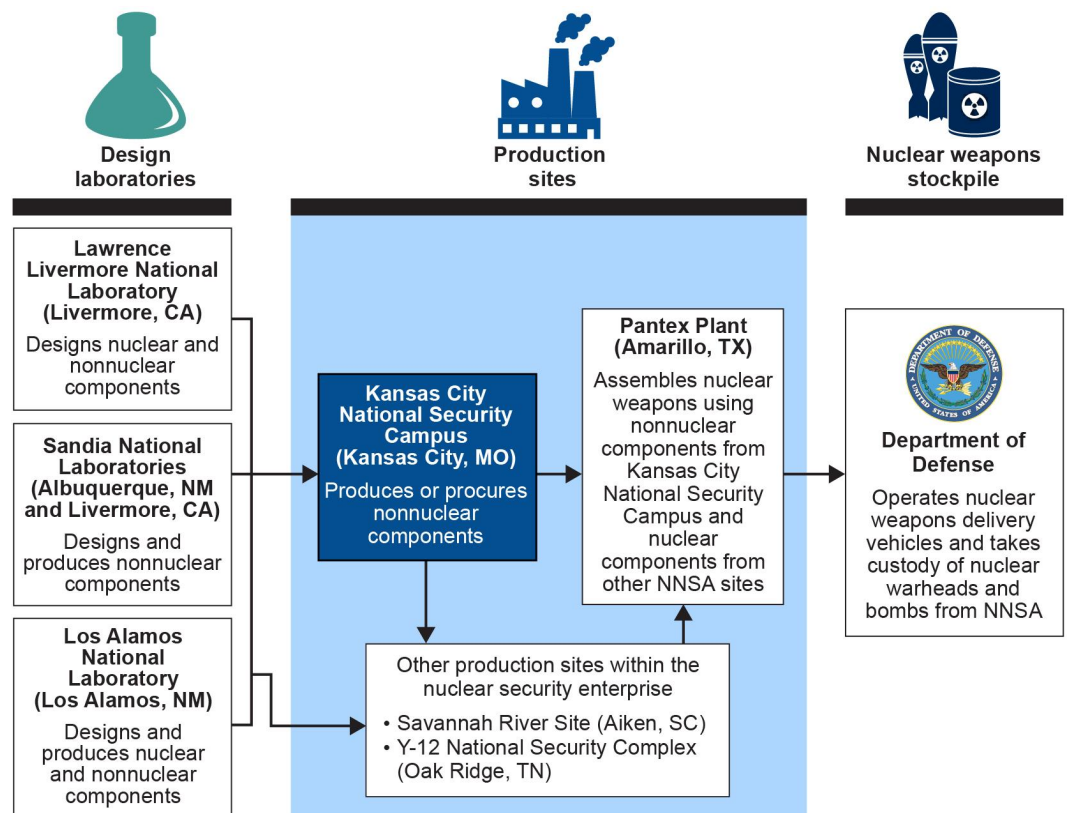
The Kansas City site is NNSA's primary site for procuring and producing nonnuclear parts and components for nuclear weapons and performing quality assurance checks on these parts. Such parts range from simple items—such as fasteners, polymers, plastics, foams, and other engineered materials—to more complex components such as machined parts, electronic microcircuits, radars,

arming and firing mechanisms, and critical nuclear safety devices meant to prevent accidental detonation.

The Kansas City site processed over 7.2 million parts in fiscal year 2022, according to contractor representatives. Of these parts, the site procured about 73 percent from outside vendors and produced the remaining 27 percent on-site. The site is currently managed and operated by Honeywell Federal Manufacturing and Technologies, LLC.<sup>3</sup>

The Kansas City site works with other NNSA sites in the nuclear security enterprise to support the nuclear weapons stockpile. For example, NNSA’s design laboratories develop precise specifications or requirements for parts to which the production sites, such as the Kansas City site, must conform in procuring or producing these items for use in the nation’s nuclear weapons stockpile. Figure 1 depicts how sites in the nuclear security enterprise interact with one another to design, produce, procure, and assemble parts.

**Figure 1: Design Laboratories and Production Sites of the Nuclear Security Enterprise**



Sources: GAO analysis of National Nuclear Security Administration (NNSA) and Kansas City National Security Campus data; GAO (icons). | GAO-24-105858

**Accessible text for Figure 1: Design Laboratories and Production Sites of the Nuclear Security Enterprise**

- **Design Laboratories**
  - Lawrence Livermore National Laboratory (Livermore, CA), Designs nuclear and nonnuclear components
  - Sandia National Laboratories (Albuquerque, NM and Livermore, CA), Designs and produces nonnuclear components
  - Los Alamos National Laboratory (Los Alamos, NM), Designs and produces nuclear and nonnuclear components

- **Production Sites**

- Kansas City National Security Campus (Kansas City, MO), Produces or procures nonnuclear components
- Pantex Plant (Amarillo, TX), Assembles nuclear weapons using nonnuclear components from Kansas City National Security Campus and nuclear components from other NNSA sites
- Other production sites within the nuclear security enterprise
  - Savannah River Site (Aiken, SC)
  - Y-12 National Security Complex (Oak Ridge, TN)

- **Nuclear weapons stockpiles**

- Department of Defense, Operates nuclear weapons delivery vehicles and takes custody of nuclear warheads and bombs from NNSA

Sources: GAO analysis of National Nuclear Security Administration (NNSA) and Kansas City National Security Campus data; GAO (icons). | GAO-24-105858

Note: In addition to the laboratories and sites identified, the Kansas City National Security Campus receives materials from Sandia National Laboratories and provides components to Los Alamos National Laboratory, Sandia National Laboratories, and the Department of Defense. NNSA also maintains a testing site in Nevada as part of the nuclear security enterprise that supports its overall mission. Also, the Pantex Plant manufactures high explosives, accepts the final product after weapons assembly, and transfers custody of the weapons to the Department of Defense.

## What facilities comprise the Kansas City site?

The Kansas City site comprises leased production and office space at its Botts Road Campus (see fig. 2) and additional leased and owned spaces across the Kansas City metropolitan area. The Kansas City site also provides services and parts for NNSA's Office of Secure Transportation at a site in Albuquerque, New Mexico.

**Figure 2: The Botts Road Campus at the Kansas City Site in Missouri**



Source: National Nuclear Security Administration. Photo is courtesy of U.S. Department of Energy. | GAO-24-105858

We previously reported that the Botts Road Campus was completed in November 2012 and replaced a deteriorating World War II-era facility, also in

Kansas City, that was much larger and had significant maintenance and operations costs. The lease for the Botts Road Campus expires in fiscal year 2033.

**What are the Kansas City site’s current and projected workload demands?**

The Kansas City site’s current workload demands exceed the site’s nominal capacity—that is, the maximum capacity that the site was designed to accommodate. In addition, according to NNSA requirements and contractor projections, the site’s workload demands may continue to increase substantially through the 2040s.<sup>4</sup>

The Botts Road Campus was constructed based on the workload forecasts that were current in 2006 and consistent with stockpile planning assumptions at the time.<sup>5</sup> Specifically, NNSA expected the existing space at the Botts Road Campus to support one weapon program in production and one weapon program in design. According to contractor representatives and documents, the nominal capacity of the Botts Road Campus can be translated into an annual workload roughly equal to 1,200 full-time equivalents (FTE) for hourly production staff.<sup>6</sup>

In contrast, as shown in table 1, the site is currently supporting two NNSA weapon programs in production and three NNSA weapon programs in design. According to contractor data as of June 2023, the site’s FTEs for hourly production staff were 1,675 in fiscal year 2022 and are estimated to be 1,650 in fiscal year 2023 and 1,461 in fiscal year 2024.<sup>7</sup>

**Table 1: Five Major NNSA Nuclear Weapon Programs Supported by the Kansas City Site, as of Fiscal Year 2023**

	Program	Description
<b>Programs in production</b>	B61-12 Life Extension Program	Addresses multiple components of the gravity bomb that are nearing end of life, in addition to military requirements for reliability, service life, field maintenance, safety, and use control. Includes refurbishment of nuclear and non-nuclear components. Will consolidate and replace the B61-3, -4, and -7 bomb variants in the active stockpile.
	W88 Alteration 370 Program	Modernizes the warhead’s arming, fuzing, and firing subsystem; improves surety; replaces the conventional high explosive and associated materials; and incorporates additional components.
<b>Programs in design</b>	W80-4 Life Extension Program	Warhead will deploy with the Air Force’s upcoming AGM-181 Long Range Standoff (LRSO) cruise missile and replace the aging AGM-86 air-launched cruise missile and the W80-1 warhead. The LRSO will improve the Air Force’s ability to defeat adversary Integrated Air Defense Systems by improving the bomber force’s delivery and survivability capabilities.
	W87-1 Modification Program	Warhead will be deployed alongside the legacy W87-0 on the LGM-35 Sentinel Missile, formerly known as the Ground-Based Strategic Deterrent. It will replace the aging W78 warhead and is slated to deploy as part of Sentinel in the 2030–2032 timeframe.
	W93 Program	Warhead will address future Navy ballistic missile requirements. It will incorporate modern technologies to improve safety, security, and flexibility to address future threats and will be designed for ease of manufacturing, maintenance, and certification. This program will also support the United Kingdom.

Source: GAO analysis of National Nuclear Security Administration (NNSA) documents. | GAO-24-105858

Note: In addition to these five programs, the Kansas City site supports other programs and activities with various levels of effort, such as NNSA’s Office of Defense Nuclear Nonproliferation programs, stockpile sustainment activities, and Department of Defense programs.

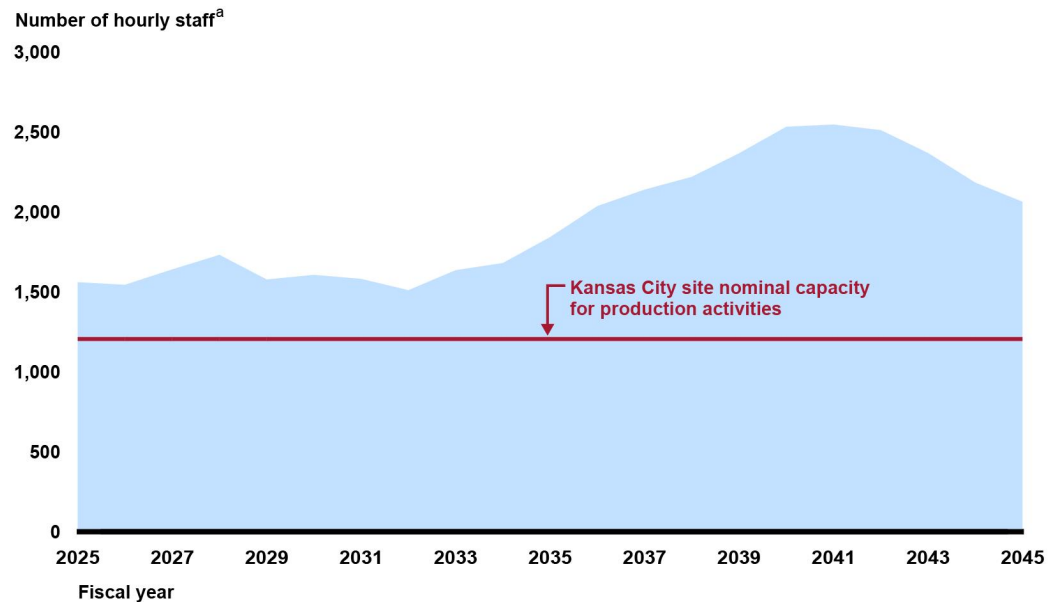
NNSA program officials reported that the site is currently meeting its production requirements at this increased workload level. However, NNSA is coordinating with the Department of Defense on additional weapon programs that are projected to further increase workload demands on the Kansas City site.



Specifically, the two agencies are working to define the appropriate ballistic missile warheads to address threats anticipated in 2030 and beyond. These warheads currently include a Future Strategic Land-Based Warhead, a Future Strategic Sea-Based Warhead, a Future Air-Delivered Warhead, and a Submarine-Launched Warhead (as a replacement for the W76-1 and W76-2) needed in the 2040s. Based on NNSA documentation, these future weapon programs will be in development and production after NNSA completes its work on its five current weapon programs.

Figure 3 shows the long-term future expected increases in workload at the Kansas City site through the 2040s, based on the contractor’s forecasted FTEs for hourly production staff as of April 2023. According to contractor representatives, hourly production staff represent between 18 and 20 percent of the total contractor workforce at the Kansas City site. The Kansas City site estimates its long-term workload demand through a planning model using several sets of requirements as assumptions, according to contractor representatives. This model uses a “what-if” approach that models standard production work with an unconstrained budget and allows for an in-depth review of labor, equipment, and material capacity information. This analytic capability helps the site contractor predict future workload demand across multiple scenarios representing different production requirements.

**Figure 3: Kansas City Site Planning Scenario Showing Number of Forecasted Hourly Production Staff to Work on NNSA Weapons Systems and Other Activities, 2025—2045**



Source: GAO analysis of Kansas City National Security Campus (Kansas City site) data. | GAO-24-105858

**Accessible data table for Figure 3: Kansas City Site Planning Scenario Showing Number of Forecasted Hourly Production Staff to Work on NNSA Weapons Systems and Other Activities, 2025—2045**

Fiscal year	Number of hourly staff
2025	1560
2026	1544
2027	1640
2028	1731
2029	1577
2030	1606
2031	1581
2032	1510

Fiscal year	Number of hourly staff
2033	1635
2034	1680
2035	1842
2036	2036
2037	2139
2038	2219
2039	2366
2040	2532
2041	2546
2042	2511
2043	2368
2044	2183
2045	2063

**Kansas City site nominal capacity for production activities = 1,205**

Source: GAO analysis of Kansas City National Security Campus (Kansas City site) data. | GAO-24-105858

Note: Data are current as of April 2023; however, NNSA has not compared the Kansas City site workload projections against fiscal year 2023 program requirements; and as a result, there is uncertainty in the forecasted numbers that we are unable to quantify. Forecasts are based on assumptions for the most likely scenario for production work associated with five ongoing nuclear weapon programs as well as other activities. Other activities include future nuclear weapon programs, stockpile sustainment, and other Department of Defense programs, such as the Mk21 Fuze Program.

<sup>a</sup>Hourly staff refers to the number of hourly full-time equivalents, which reflect the total number of regular straight-time hours (i.e., excluding overtime or holiday hours) worked by employees divided by the number of compensable hours applicable to each fiscal year.

These are the most recent projections available from the site. However, NNSA officials and contractor representatives stated that these long-term projections of future workload are not definitive. For example, NNSA officials said that they have not yet compared the contractor’s projections against NNSA’s program requirements for fiscal year 2023. In addition, contractor representatives stated that several uncertainties can affect the site’s ability to develop accurate workload projections, such as uncertainty in program requirements, designs, and complexity; new product introduction and new mission assignments; production technologies planning; sourcing of parts; and budget constraints. Moreover, changes to planning assumptions, driven by changes in U.S. policy and strategic plans, may lead to changes in facility requirements at the site.

**What actions have been taken to obtain sufficient space at the Kansas City site?**

NNSA and the site contractor have taken several actions to help ensure that the Kansas City site has the production and office space needed to meet its projected workload demands, including conducting studies, reorganizing existing space at the Botts Road Campus, acquiring additional space near the Botts Road Campus, and developing plans to acquire additional nearby space.

**Conducting studies.** Since 2018, NNSA and the site contractor have carried out four studies to identify possible approaches to address the site’s space challenges.<sup>8</sup> According to these studies, the site will need a total of 2.5 to 3 million square feet of production and office space to meet projected workload demands over the next decade—including its current Botts Road Campus, which provides a total of approximately 1.6 million square feet of office, production, and other space.<sup>9</sup>

**Reorganizing existing space.** NNSA and the site contractor have taken steps to use the existing space at the Botts Road Campus more effectively. For example, according NNSA officials, the site is currently operating above its nominal capacity by having staff work in multiple shifts. In addition, the site contractor is reorganizing existing production and office space, pursuing short-term leases in

nearby buildings, and approving remote work for some employees. Contractor representatives have also taken steps to use space more efficiently by installing vertical equipment storage systems (see fig. 4) and removing excess items from inventory.

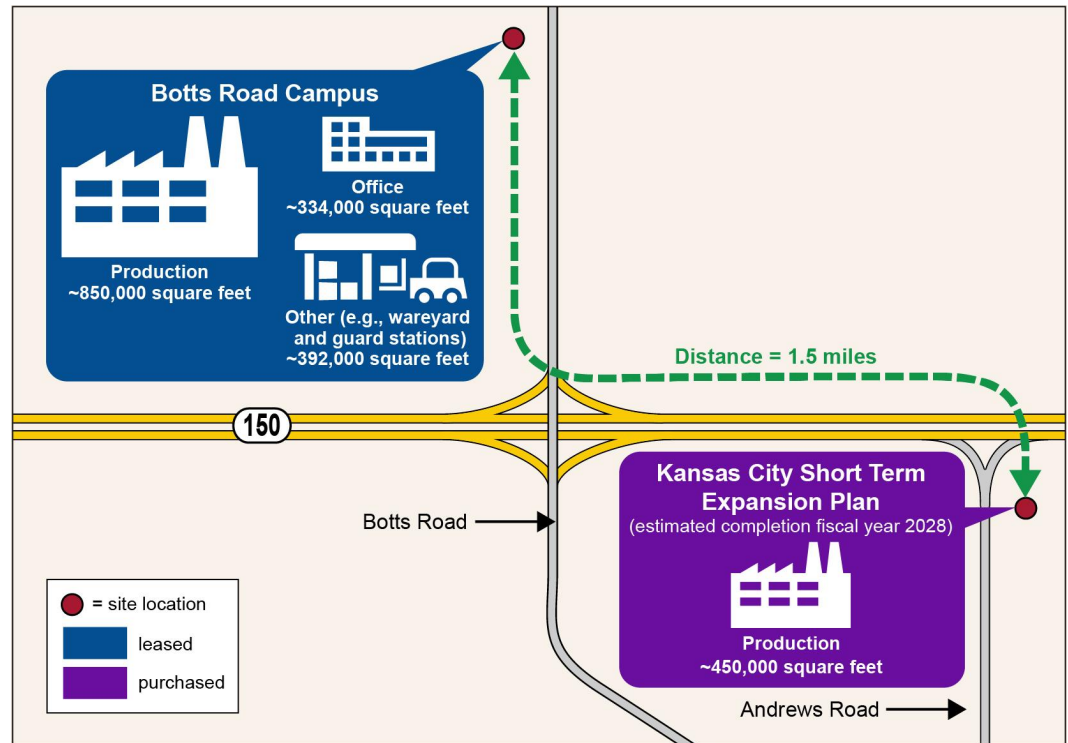
**Figure 4: Vertical Equipment Storage Systems at the Kansas City Site**



Source: National Nuclear Security Administration. Photo is courtesy of the Kansas City National Security Campus (Kansas City site). | GAO-24-105858

**Acquiring additional space.** NNSA has acquired additional production space outside of the Botts Road Campus, using a strategy known as the Kansas City Short Term Expansion Plan (KC STEP). KC STEP involves acquiring additional, nearby production space through the purchase of a building, which will allow the site to move some capabilities into the new space and further reorganize existing production space at the Botts Road Campus. In February 2023, NNSA completed its purchase of the building and is currently refitting the facility. According to NNSA's plans, this building will provide the Kansas City site with an additional 450,000 square feet of space (see fig. 5). NNSA officials expect to complete this project in fiscal year 2028 at an estimated cost of \$647 million.

**Figure 5: National Nuclear Security Administration’s Plans for the Kansas City Site**



Sources: GAO analysis of National Nuclear Security Administration (NNSA) and Kansas City National Security Campus (Kansas City site) information; GAO (icons). | GAO-24-105858

**Planning to acquire more space.** NNSA is developing a long-term plan to acquire additional space to address its workload needs, referred to as the Kansas City Nonnuclear Expansion Transformation (KC NExT). According to NNSA officials, the agency has conducted an analysis of its options for this effort, and it is in the early stages of negotiating with the developer to purchase the first phase of a planned 15-phase campus on a parcel of land east of the Botts Road Campus that is not currently owned by the government. The 15 phases will provide a total of 1,120,000 square feet of manufacturing space and approximately 675,000 square feet of office space. NNSA has finalized its requirements for Phase 1 of KC NExT which will include 162,000 square feet of office space. According to NNSA officials, the developer is scheduled to deliver the first group of buildings in 2026. Subsequent phases are expected to be completed annually and NNSA officials are targeting completion of the entire project by fiscal year 2043. NNSA officials anticipate that the full cost of KC NExT will be several billion dollars.

The KC NExT plan is a real estate acquisition involving a series of lease-purchase agreements, to acquire in phases both the land and the facilities, once constructed. Office of Management and Budget (OMB) guidance directs agencies pursuing lease-purchase agreements to request appropriations that cover the full amount of the lease-purchase agreement in the first year of the request—rather than requesting appropriations that reflect averaged costs of the lease over time.<sup>10</sup> NNSA plans to request the necessary funding for each phase once the amount is known and in the appropriation year funding will be needed for execution. According to NNSA officials, KC NExT will represent the first lease-purchase agreement in the agency’s history, and they said that NNSA has been meeting monthly with OMB officials to discuss this approach.

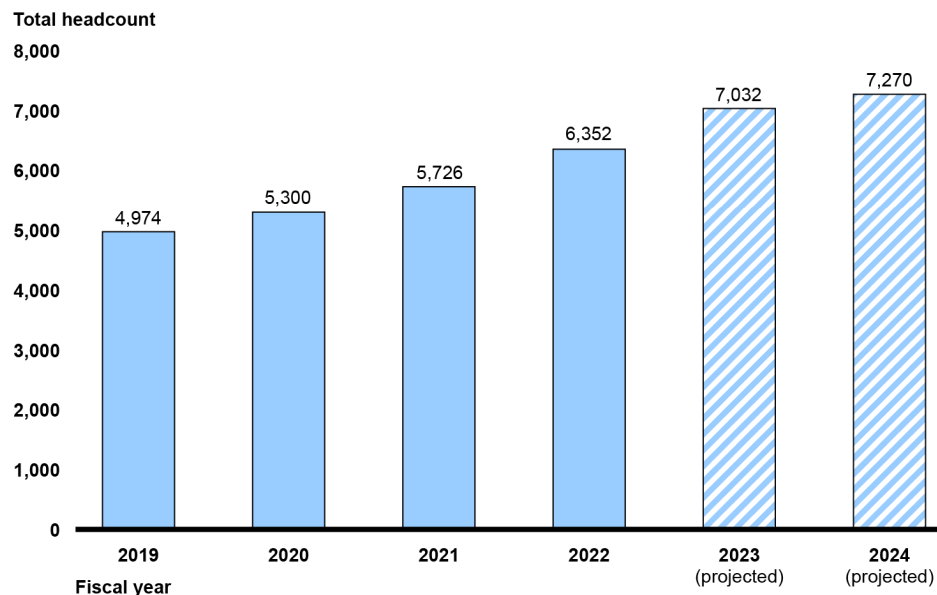


**What actions have been taken to ensure a sufficient contractor workforce at the Kansas City site?**

NNSA and the site contractor have taken several actions to help ensure that the Kansas City site has the contractor workforce needed to meet its projected workload demands, including increased hiring, efforts to reduce attrition, and a streamlined security clearance process.

**Increased hiring.** The Kansas City site has increased the size of its contractor workforce since 2019. Specifically, as shown in figure 6, contractor staff at the site numbered 4,974 in fiscal year 2019 and increased to 6,352 by the end of fiscal year 2022. According to contractor documents, the site plans to increase its workforce to over 7,000 during fiscal year 2023 and 7,270 by fiscal year 2024.<sup>11</sup>

**Figure 6: Number of Kansas City Site Contractor Staff, Fiscal Years 2019 to 2024**



Source: GAO analysis of Kansas City National Security Campus (Kansas City site) data. | GAO-24-105858

**Accessible data table for Figure 6: Number of Kansas City Site Contractor Staff, Fiscal Years 2019 to 2024**

Fiscal year	Total headcount
2019	4,974
2020	5,300
2021	5,726
2022	6,352
2023 (projected)	7,032
2024 (projected)	7,270

Source: GAO analysis of Kansas City National Security Campus (Kansas City site) data. | GAO-24-105858

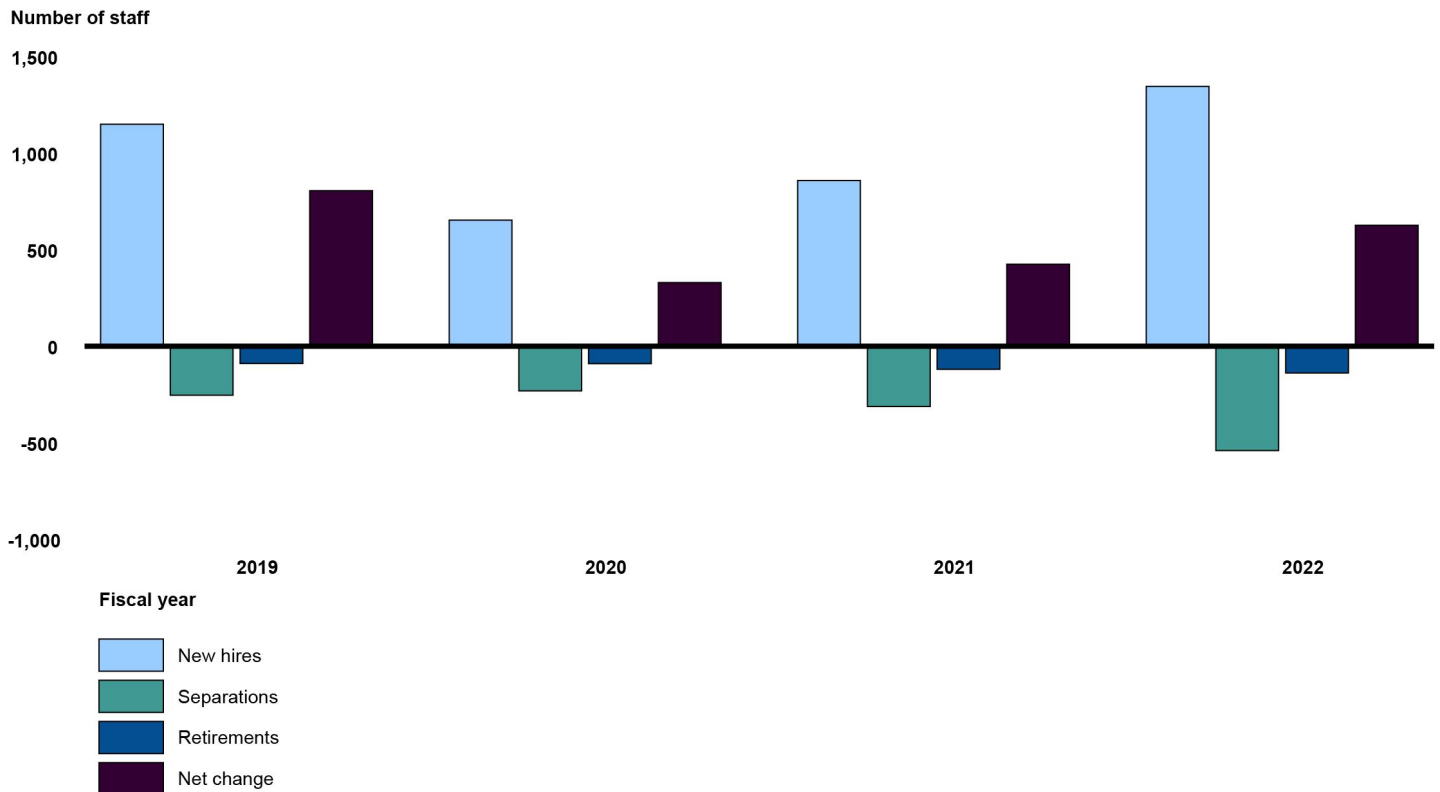
Note: Data for fiscal years 2023 and 2024 are projections. According to contractor representatives, the Kansas City site uses workload to determine the direct and indirect headcount that will be required through the Future Years Nuclear Security Program, which is an Office of Management and Budget-approved projection of budgetary needs for an additional four fiscal years beyond the year requested.

Despite these hiring efforts, the site anticipated a 1.94 percent gap between its projected and target headcounts for fiscal year 2023, based on information as of mid-September 2023. This gap did not include positions for which an offer of employment had been accepted but the start date had not yet occurred. However, according to contractor representatives, they are taking actions to address this gap and anticipate that the gap will not affect the site’s ability to meet workload demands.

For example, the site is leveraging the use of overtime, monitoring the site’s ability to meet hiring targets on a weekly basis, and conducting monthly reporting regarding the status of hiring and actions taken to meet targets across various departments at the site. The site has also taken steps to increase its pipeline of talent, such as by increasing the site’s social media presence, partnering with local chambers of commerce to help identify prospective hires, and exploring ways to simplify the hiring process, according to contractor representatives we interviewed. In addition, the site has increased the number of interns it hires, from 67 in fiscal year 2019 to almost 100 in fiscal year 2022.

**Reducing attrition.** The rate of growth in the site’s contractor workforce over time has been partially offset by an increase in attrition through separations and retirements (see fig. 7). For example, the site hired 1,345 new staff but lost 680 staff due to attrition in fiscal year 2022. According to contractor representatives, attrition at the Kansas City site increased from about 6 percent in 2020 to about 11 percent in 2022 (data annualized as of May 2022).

**Figure 7: Numbers of New Hires, Separations, and Retirements for Kansas City Site Contractor Staff, Fiscal Years 2019 to 2022**



Source: GAO analysis of Kansas City National Security Campus (Kansas City site) data. | GAO-24-105858

**Data table for Figure 7: Numbers of New Hires, Separations, and Retirements for Kansas City Site Contractor Staff, Fiscal Years 2019 to 2022**

	FY 2019	FY 2020	FY 2021	FY 2022
New Hires	1,149	652	857	1345
Separations	-254	-232	-313	-541
Retirements	-90	-91	-120	-139
Net change	805	329	424	626

Source: GAO analysis of Kansas City National Security Campus (Kansas City site) data. | GAO-24-105858

Note: Data are as of September 30, 2022. Due to employee status changes, long-term leaves, and other factors impacting employee count throughout the year, net change values may not total.

Contractor representatives said that the site has employed several strategies for reducing attrition. These include compensation actions such as a mid-year compensation adjustment, employee engagement surveys and action plans, expanding remote work options, and additional training and tools for managers. The site also announced an expanded vacation policy that will be implemented in the near future, according to contractor representatives. In addition, retirement eligibility continues to decline—from approximately 18 percent at the end of fiscal year 2019 to just under 12 percent at the end of fiscal year 2022, according to contractor representatives.

**Streamlining the security clearance process.** The Kansas City site has continued to take steps to streamline the process for reviewing and submitting security clearance applications, which is necessary for ensuring the availability of its contractor workforce.<sup>12</sup> These steps include, but are not limited to, streamlining internal processes, starting the clearance process prior to a new hire's start date, using priority clearance requests, and increasing the use of interim clearances. According to contractor representatives, the site realized about \$6.6 million in cost savings and cost avoidance from these efforts in fiscal year 2021, the last year that these cost savings were documented.

In addition, the site has reported a significant decrease in the average time to grant a priority security clearance—from 362 days in 2018 to 83 days in 2022. This is below the average time for the nuclear security enterprise, which was 91 days as of January 2023. Moreover, the site has granted more security clearances in recent years (with over 1,100 granted in fiscal year 2022) and issued more interim clearances in recent years (with 417 issued in fiscal year 2022).

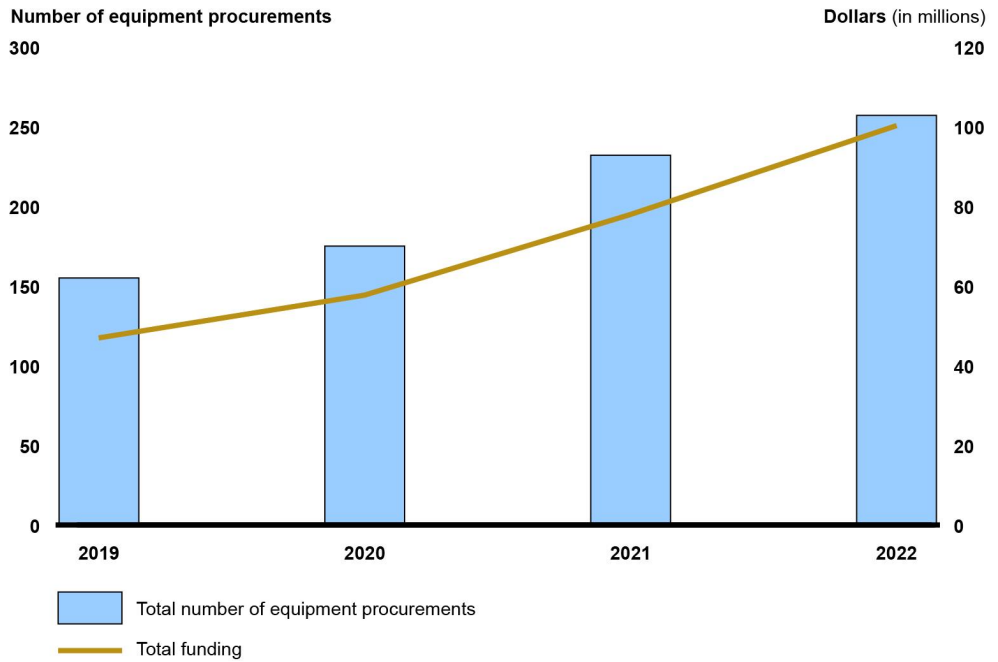
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**What actions have been taken to obtain sufficient equipment at the Kansas City site?**

NNSA and the site contractor have taken several actions to help ensure that the Kansas City site has sufficient equipment to meet its projected workload demands, including procuring more equipment, maintaining existing equipment, revising the process for requesting new equipment, and planning for future procurements.

**Procuring more equipment.** According to contractor representatives, the site received additional funding to purchase more equipment in recent years to help ensure the site's ability to reliably meet production needs (see fig. 8). We reported in 2019 that the Kansas City site has experienced challenges with equipment capacity and aging production equipment because recapitalizing equipment was not a significant part of the site's 2012 move to the Botts Road Campus.<sup>13</sup> Contractor representatives reported that the site has since been able to increase equipment procurement by communicating specific equipment needs to various NNSA offices, such as by holding high-level planning meetings and meetings with specific program offices. Federal program managers reported that contractor representatives have contacted them about specific equipment needs for their programs, which they have provided funding to acquire.

**Figure 8: Kansas City Site Equipment Procurement, Fiscal Years 2019–2022**



Source: GAO analysis of Kansas City National Security Campus (Kansas City site) data. | GAO-24-105858

**Accessible data table for Figure 8: Kansas City Site Equipment Procurement, Fiscal Years 2019–2022**

Year	Total number of equipment procurements	Total funding (in millions)
2019	155	46.9
2020	175	57.6
2021	232	77.6
2022	257	100.2

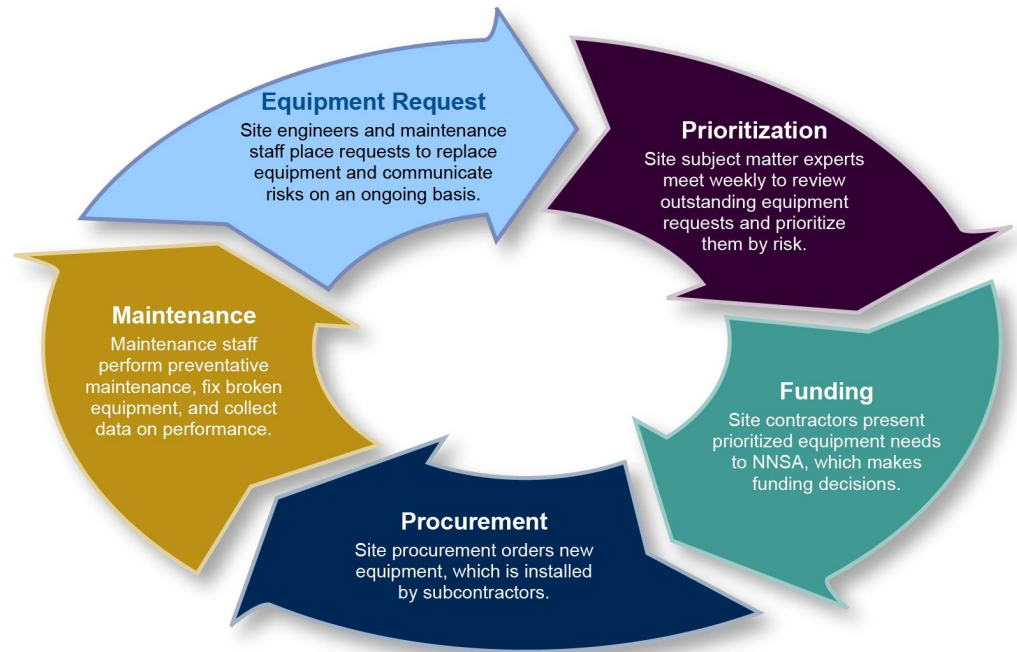
Source: GAO analysis of Kansas City National Security Campus (Kansas City site) data. | GAO-24-105858

**Maintaining existing equipment.** The site is making efforts to improve equipment maintenance and inventory management. According to contractor representatives, preventative maintenance can lengthen equipment life, and the site is collecting information on equipment maintenance to identify equipment safety and reliability risks, which the site uses to inform the equipment request system.

**Revising process for requesting new equipment.** According to contractor representatives, the site has instituted a new equipment request process, as shown in figure 9, which allows the site to better prioritize requests and communicate needs to NNSA. For example, rather than submitting equipment requests during a designated annual time period, contractors can now submit requests at any time and subject matter expert teams review the requests weekly to prioritize them. Contractor representatives stated that the new process has resulted in better data on equipment needs, which has reduced workload and improved planning. Because the site is still developing some elements in the process, it is not yet clear whether this process will fully resolve the site’s equipment challenges.



**Figure 9: Kansas City Site Equipment Request Process**



NNSA = National Nuclear Security Administration

Source: GAO analysis of Kansas City National Security Campus (Kansas City site) information. | GAO-24-105858

**Accessible text for Figure 9: Kansas City Site Equipment Request Process**

- 1. Equipment Request**  
Site engineers and maintenance staff place requests to replace equipment and communicate risks on an ongoing basis.
- 2. Prioritization**  
Site subject matter experts meet weekly to review outstanding equipment requests and prioritize them by risk.
- 3. Funding**  
Site contractors present prioritized equipment needs to NNSA, which makes funding decisions.
- 4. Procurement**  
Site procurement orders new equipment, which is installed by subcontractors.
- 5. Maintenance**  
Maintenance staff perform preventative maintenance, fix broken equipment, and collect data on performance.

Source: GAO analysis of Kansas City National Security Campus (Kansas City site) data. | GAO-24-105858

**Planning for future procurements.** According to contractor representatives, NNSA’s plans to expand the Kansas City site will be accompanied by investments in new equipment to outfit the space. Specifically, as part of the KC STEP process, the site is executing a plan to procure additional equipment from fiscal years 2020 through 2025, totaling approximately \$180 million.

**What actions have been taken to obtain sufficient external suppliers at the Kansas City site?**

NNSA and the site contractor have taken several actions to help ensure that the Kansas City site has a sufficient number of external suppliers to meet its projected workload demands, including reevaluating its “make vs. buy” decision process, strengthening the supply base, updating the tools to monitor supplier capacity and risks, and restructuring contractor offices. The site requires a large supply base to support the growth in program demands, according to contractor representatives.

**Reevaluating the site’s “make vs. buy” decision process.** In 2022, the site began reevaluating its “make vs. buy” decision process, as part of updating its long-term business strategy. The site uses the “make vs. buy” decision process to determine what parts to make on-site using its core competencies and what parts to buy from external suppliers. According to contractor documentation, the Kansas City site currently procures about 73 percent of its parts and components from external suppliers and produces the remaining 27 percent of its parts in-house. According to contractor representatives, they plan to consider such factors as site production capacity, external supplier capability, strategic alignment, and vendor performance in making this decision. They stated that the site is in the final stages of determining what its long-term core competencies will be, and that the new “make vs. buy” process will be implemented once the updated core competency determination is complete. However, they did not provide a time frame for when those steps will take place.

**Strengthening the supply base.** According to contractor representatives, the site has taken two main actions to strengthen its supply base. Considering the growth in program demands and that the site procures a majority of its parts from external suppliers, challenges with the supply base can impact the site’s ability to meet its requirements, according to site contractor representatives. To strengthen the supply base, the site enhanced its communication with its existing network of external suppliers. For example, the site now holds “supplier summits,” which are meetings between external suppliers and site leadership to communicate and discuss upcoming needs. The site also shares information with external suppliers on the site’s current and future needs.

Second, the site developed initiatives to increase the number of external suppliers with which it has signed long-term contracts.<sup>14</sup> These initiatives include engaging with vendors who submit requests for information and requests for proposals. According to contractor representatives, long-term contracts are desirable because they can shorten the time needed to order and obtain parts. However, because nuclear weapon parts typically involve much stricter specifications and lower quantities than other commercially available parts, the site continues to face obstacles in obtaining external suppliers who will sign long-term contracts.

**Updating tools to monitor and assess supplier risk.** In 2022, the site contractor developed a new supplier risk-based formula that, according to contractor representatives, provides the site a broader and more in-depth look at various tiers of its external supply chains. The site contractor also revamped how vendor capacity is measured by developing a long-term forecasting model to better ensure supply will meet demand in the future. According to contractor representatives, the site uses these updated tools to, among other things, monitor, respond, mitigate, and report supplier risks for further action. The site then measures the effectiveness of these tools through its overall risk assessment model known as Supplier Health. According to contractor representatives, as indicators of Supplier Health increase, the overall risk to the supply chain decreases.

**Restructuring contractor offices.** To optimize the effectiveness of its supply chain, the site restructured the offices responsible for leading these efforts. According to contractor representatives, in 2020 the site created its Strategic Sourcing Department, which is tasked with enabling continuity of supply through ensuring the supply base is right-sized for the demands of the business. It accomplishes this through multiple initiatives, including those previously discussed to use long-term contracts and enhanced tools to monitor and assess risk to ensure that the parts the site procures arrive on time. In 2021, the site formed its Purchased Product Center of Excellence, which is responsible for all

purchased products. This Center of Excellence encompasses the Strategic Sourcing Department—along with the Procurement and the Technical and Quality Operations Departments—to promote a stable and predictable supply chain to ensure continuity of supply for the site’s overall mission.

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**What actions have been taken to improve quality assurance practices at the Kansas City site?**

NNSA and the site contractor have taken several actions to help improve quality assurance practices for electronic parts at the Kansas City site. In general, quality assurance practices across the nuclear security enterprise involve different kinds of testing procedures, such as qualification testing and acceptance testing.

- Qualification testing ensures that a part, its design, and all associated processes are capable of meeting customer requirements. It typically includes tests (such as environmental tests or flight tests) that cannot feasibly be performed on a continual basis during production.
- Acceptance testing ensures that a part, whether purchased or manufactured on-site, meets all of its requirements, as described in the quality approval document for that part. The Kansas City site or an external vendor conducts acceptance testing on an ongoing basis, which may include testing every part or a certain number of parts per lot.

In the 2018—2019 time frame, NNSA and contractors at the Kansas City site determined that an electronic part—a capacitor planned for use in both the B61-12 Life Extension Program and the W88 Alteration 370 program—failed qualification testing and was not suitable for use in these weapon programs. This technical issue resulted in an approximate 20-month delay in the production schedule for each program and an estimated combined cost growth of roughly \$850 million. According to an April 2020 report conducted by an independent NNSA team, one factor that led to this result was a lack of formality in technical and risk decision-making and incomplete communication and documentation of those decisions among NNSA, the Kansas City site, and Sandia National Laboratories (Sandia).<sup>15</sup>

To address the findings from the 2020 report, the Kansas City site has taken three major steps to improve quality assurance practices for electronic parts.

**Implementing the Electronic Parts Program.** The Kansas City site and Sandia began developing a revised quality assurance process for electronic parts—which they refer to as the Electronic Parts Program (EPP)—in parallel with the release of the April 2020 NNSA report. Prior to EPP, the Kansas City site conducted both qualification testing and acceptance testing on procured electronic parts. Under EPP, Sandia conducts qualification testing for electronic parts earlier in the design process and develops a list of approved parts. The Kansas City site then procures parts that are on the approved list and conducts acceptance testing on the parts.

**Updating policies and procedures.** NNSA and the Kansas City site have updated the relevant directive and other documents to reflect the new EPP process. For example, the agency updated its directive on weapon quality in June 2021 to incorporate changes associated with conducting qualification testing earlier in the design process and to apply these changes to all sites in the nuclear security enterprise.<sup>16</sup> Contractor representatives stated that the site updated its quality manual in 2022 to reflect these changes.

**Using external testing entities.** Contractor representatives stated that in response to the increase in workload for conducting acceptance testing on electronic parts from external suppliers, the site now uses three external testing entities to conduct acceptance testing. Contractor representatives stated that the

additional test entities, along with implementing the EPP, have enabled the site to increase the number of parts available for production with greater efficiency.

According to contractor representatives, the site's quality assurance process for non-electronic components has not changed.

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### What challenges remain at the Kansas City site?

The Kansas City site may still face challenges in meeting projected workload demands, including (1) obtaining a sufficient amount of production and office space, (2) ensuring a sufficient contractor workforce, (3) maintaining a sufficient number of external suppliers.

First, NNSA may still face challenges in meeting the space requirements needed to support the projected workload demands at the Kansas City site. For example:

- NNSA may face challenges implementing its KC NExT plan within its planned time frames. According to contractor representatives, it will be challenging to meet the baseline dates for the KC NExT plan with ongoing supply chain challenges. For example, the lead time for procuring some electrical components (such as transformers) needed for the expansion has increased from about 7 months to up to 2 years. In addition, NNSA has identified a number of risks that could affect the completion time of the KC NExT plan, including potential funding delays, lack of construction labor, and potential procedural delays associated with attempting a novel type of acquisition.
- NNSA may face challenges in meeting projected workload demands by 2028. According to NNSA documentation and officials, increasing workload requirements in fiscal year 2028 may begin to exceed the space available through the combined Botts Road campus and KC STEP expansion, even with the continued use of multiple shifts. According to NNSA officials, NNSA intends to meet its need for additional space with the initial stages of KC NExT. According to NNSA officials, construction may be completed on the first KC NExT office building as soon as fiscal year 2026. However, additional production space from KC NExT may not be available in time to mitigate the site's space challenges, and the site may require continued use of multiple shifts in many work areas to meet projected workload demands.
- NNSA may face challenges in meeting projected workload demands in the 2040s. According to NNSA workload projections, the Kansas City site will need over 2.5 million square feet of space to meet projected demands in the 2040s. If the KC STEP and KC NExT expansions are completed by that time, the total projected space for the Kansas City site—including the current Botts Road Campus and the expansions provided by KC STEP and KC NExT—will be approximately 3.8 million square feet.<sup>17</sup> However, some NNSA officials stated that in the 2040s, the Kansas City site may require additional infrastructure to support NNSA's requirements, as peak workload at that time may exceed the planned capacity of the site. NNSA officials stated that the precise amount of additional space that may be needed at that time is unclear due to the potential effects of changes in U.S. policy and strategic plans on facility requirements.

Second, the site faces several ongoing challenges related to its contractor workforce, including filling specialized positions, attrition among staff with 5 years or less of service, and general economic conditions.

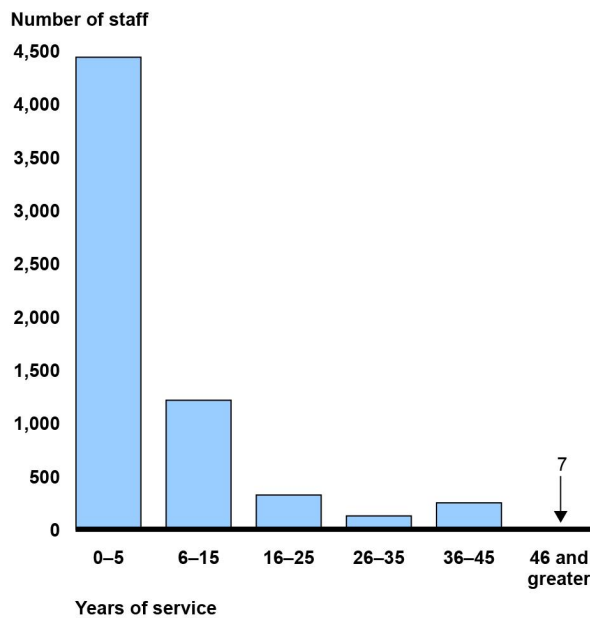
- **Filling specialized positions.** The site faces challenges filling highly specialized roles in engineering, cybersecurity, and information technology, according to contractor representatives. The site has taken some steps to address these challenges, such as working with local universities to offer



specific courses incorporated into the curriculum, offering on-the-job training, and offering remote positions when possible, according to contractor representatives. However, according to contractor representatives, it can take an average of 115 days from the time an employee announces an intention to leave any role to when the position is filled.

- Attrition among staff with 5 years or less of service.** The site has seen a marked increase in its contractor workforce with 5 years or less of service. As shown in figure 10, approximately 70 percent of site staff had 5 years or less of service in fiscal year 2022 (compared with 53 percent in fiscal year 2017 that we previously reported). In several divisions with smaller numbers of staff, the average tenure does not exceed 5 years. According to contractor representatives, the site’s attrition rate is highest among staff in this category, and as a result, the site could face significant challenges retaining these staff over time.

**Figure 10: Kansas City Site Contractor Staff by Years of Service, Fiscal Year 2022**



Source: GAO analysis of Kansas City National Security Campus (Kansas City site) data. | GAO-24-105858

**Accessible data table for Figure 10: Kansas City Site Contractor Staff by Years of Service, Fiscal Year 2022**

Years of service	Number of staff
0-5	4,436
6-15	1,213
16-25	322
26-35	125
36-45	249
46 and greater	7

Source: GAO analysis of Kansas City National Security Campus (Kansas City site) data. | GAO-24-105858

Note: Data are as of September 30, 2022.

- Economic conditions.** According to contractor representatives, inflation has affected prospective hires’ salary expectations, and national labor shortages have also increased demand for the same talent pool. These conditions led to an overall decrease in job offer acceptance from the usual rate of over 90 percent to between 80 and 90 percent during fiscal year 2022, as well as an

increase in the number of withdrawals between offer acceptance and start date, according to contractor representatives. The site is taking some steps to address this challenge, such as continuing to improve employee benefits and discussing strategies for filling historically hard to fill positions. In addition, given the workforce recruiting and retention issues that exist across the nuclear security enterprise, a 2022 NNSA report recommended, among other things, that NNSA should allow site contractors greater authority over salaries, benefits, and management of its workforce.<sup>18</sup> NNSA has established task teams to evaluate the implementation of this and other recommendations.

Third, contractor representatives anticipate that the site may continue to face several challenges that could affect its efforts to maintain a sufficient number of external suppliers. These challenges include ongoing changes to the supplier base, changes in technologies over time (as some technologies become obsolete), supply chain disruptions, and rising costs due to inflation. NNSA program officials are aware of the challenges the site currently faces with external suppliers but stated that these challenges have not affected the site's ability to meet requirements, and they expect the site to meet its near-term milestones for production.

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## Agency Comments

We provided a draft of this report to NNSA for review and comment. The agency provided technical comments, which we incorporated as appropriate.

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## How GAO Did This Study

We reviewed relevant documentation and data related to space, personnel, equipment, external suppliers, and quality assurance from the site contractors and NNSA. For example, we reviewed Kansas City site capacity analyses; workforce planning documents; analyses of information on the capacity of external suppliers; site leases; equipment lists; and a report conducted by an independent NNSA review team. We reviewed studies of office and production space needs at the site and determined that they were sufficiently reliable to describe NNSA's estimates of the space needed to meet requirements at the site, as well as the possible approaches NNSA is considering. We also obtained information from the site contractors and NNSA on actions the Kansas City site has taken over the past 4 years regarding infrastructure, business processes, staffing, and other areas to manage current workload demands.

We reviewed and analyzed contractor data on workload demand projections for the site to describe future workload demands. We also reviewed and analyzed contractor data on employee hiring (including time to fill positions and job acceptance rates), attrition (including years of service and retirements), and obtaining necessary security clearance, to describe the site's workforce. In addition, we reviewed data on equipment procurements at the site.

To assess the reliability of the data we collected, we had responsible contractor representatives complete a data reliability questionnaire, and we interviewed knowledgeable contractor representatives. Whenever possible, we corroborated contractor-forecasted data on workload as well as other workforce data by reviewing other sources, such as information from NNSA's Enterprise Modeling and Analysis Consortium and Stockpile Stewardship Management Plan. We found the data sufficiently reliable for describing the site's forecasted workload demands, trends in the site's workforce, and equipment procurements.

We interviewed and obtained written responses from agency officials and contractor representatives to describe the site's forecasted workload and current capacity to meet known future production requirements and to collect information on the actions taken to address challenges related to space, personnel,

equipment, external suppliers, and quality assurance. We spoke with the primary contractor representatives for the site, including from the Department of Human Resources, the Production Equipment Maintenance Division, and the Facilities and Future Infrastructure Division, among others. For example, we interviewed contractor representatives responsible for employee recruitment and retention efforts at the site to gather information on actions taken to address hiring and retention challenges, including changes to employee benefits and time to fill vacancies. We also conducted a site visit to observe efforts to modify existing space, as well as the site's ongoing efforts to expand operations at a new facility.

We also spoke with the primary NNSA officials who provide oversight of the Kansas City site, including officials from NNSA's Office of Infrastructure, Office of Defense Programs, and Office of Partnership and Acquisition Services, among others. We also interviewed NNSA officials to describe how the challenges the site has faced have affected weapon programs' ability to meet major project milestones, and we interviewed DOE officials to describe DOE policies related to site expansion plans.

We conducted this performance audit from March 2022 to November 2023 in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

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## List of Addressees

The Honorable Jack Reed  
Chairman  
The Honorable Roger Wicker  
Ranking Member  
Committee on Armed Services  
United States Senate

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## Endnotes

<sup>1</sup>GAO, *Modernizing the Nuclear Security Enterprise: NNSA is Taking Action to Manage Increased Workload at Kansas City National Security Campus*, [GAO-19-126](#) (Washington, D.C.: April 12, 2019).

<sup>2</sup>S. Rep. No. 117-39, at 364 (2021). In this report, we use the terms “workforce,” “equipment,” and “external supplier” instead of “employee hiring,” “production equipment recapitalization,” and “commercial sourcing,” respectively.

<sup>3</sup>Honeywell Federal Manufacturing and Technologies, LLC, has managed and operated the Kansas City site since 2000. NNSA awarded the most recent management and operating contract for the site in July 2015, and the base period for that contract ended in 2020. NNSA has exercised all of the contract’s option periods through September 2025. Management and operating contracts are agreements under which the government contracts for the operation, maintenance, or support, on its behalf, of a government-owned or government-controlled research, development, special production, or testing establishment wholly or principally devoted to one or more major programs of the contracting federal agency. 48 C.F.R. §17.601.

<sup>4</sup>According to contractor representatives, workload demands include the *Production and Planning Directive*, which provides NNSA’s program requirements. In addition, the site also considers requirements from the Department of Defense and partnership agreements. The site also considers requirements for sustainment, modernization, and other concerns such as changing classification requirements.

<sup>5</sup>According to NNSA documents, the Kansas City site’s capacity was based on the fiscal year 2006 *Stockpile Stewardship and Management Plan* and initial assumptions for the now-completed W76-1 program, which did not require significant numbers of professional or engineering staff to support production phase activities.

<sup>6</sup>Calculations of FTEs reflect the total number of regular straight-time hours (i.e., excluding overtime or holiday hours) worked by employees divided by the number of compensable hours applicable to each fiscal year.

<sup>7</sup>The FTE counts included in this statement are for work associated with the five nuclear weapon programs described in Table 1, as well as other programs and activities such as stockpile sustainment activities and Department of Defense programs. In addition, these near-term workload projections include site assessments of new work required in fiscal years 2023 and 2024 and can be expected to grow driven by carryover work as well as changing workload profiles driven by NNSA requests to the site.

<sup>8</sup>Studies conducted by NNSA to identify possible approaches to the space challenges at the Kansas City site include: National Nuclear Security Administration, *Mission Need Statement Office and Manufacturing Space Expansion Project Kansas City National Security Campus (KCNSC)* (Sept. 2018); National Nuclear Security Administration, *Kansas City Strategic Infrastructure for Non-Nuclear Components Planning Study* (May 2019); National Nuclear Security Administration, *Non-Nuclear Component Capability (NNCC) Requirements Study and Analysis* (Aug. 2020); and National Nuclear Security Administration, *KCNSC Land Expansion Business Case Analysis Report* (May 2022). The *KCNSC Land Expansion Business Case Analysis Report* was followed by an addendum in June 2023 to include updated information.

<sup>9</sup>In this report, unless otherwise noted, we report space in terms of total square footage, as opposed to usable square footage. We previously reported that the move to the Botts Road Campus reduced the footprint of the site’s production activities from about 3 million square feet to 1 million square feet. See [GAO-19-126](#).

<sup>10</sup>For more information, see OMB Circular No. A-11, Appendix B, “Budgetary Treatment of Lease-Purchases and Leases of Capital Assets” (2022).

<sup>11</sup>Due to employee status changes, long-term leaves, and other factors impacting employee count throughout the year, net change values may not total or equate to the full-time equivalent counts discussed in an earlier section.

<sup>12</sup>We previously reported that 100 percent of staff who directly contribute to the design, disposition, fabrication, inspection, scheduling, and protection of products and services related to nuclear weapons require a Q clearance. Moreover, the large majority of support functions also require a Q

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clearance. DOE and U.S. Nuclear Regulatory Commission Q clearances are equivalent to top-secret clearances granted by DOD. See [GAO-19-126](#).

<sup>13</sup>According to contractor representatives, older equipment that was still needed and operational was moved from the old facility to the new facility. For more information, see [GAO-19-126](#).

<sup>14</sup>According to contractor representatives, the site has a goal to increase the number of long-term contracts in place from 14 percent (in fiscal year 2022) to 30 percent in the near future.

<sup>15</sup>National Nuclear Security Administration, *Independent Review: B61-12 Life Extension Program and W88 Alteration 370 Technical Issue* (April 2020).

<sup>16</sup>National Nuclear Security Administration, *Weapon Quality Policy*, NAP 401.1A (June 23, 2021).

<sup>17</sup>According to site contractors, the total square footage of the Botts Road Campus is 1,576,189. Our projected figure of 3.8 million square feet for the Kansas City site is based on total square feet for the Botts Road Campus, KC STEP, and KC NEXT.

<sup>18</sup>National Nuclear Security Administration, *Evolving the Nuclear Security Enterprise: A Report of the Enhanced Mission Delivery Initiative* (Washington, D.C.: Sept. 2022).