



Delivering Technical Expertise and Innovative Solutions

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NUCLEAR SAFETY

Since its inception in 1996, Sigma Science has delivered high quality nuclear safety engineering services to the U.S. Department of Energy (DOE), other federal agencies, and prime contractors. With more than 25 years of experience as a trusted provider of nuclear professional services, Sigma is recognized as one of the highest quality providers of nuclear safety engineering throughout the nation's nuclear enterprise. This includes services for DOE, National Nuclear Security Administration (NNSA), DOE Office of Science (DOE-SC), DOE Office of Environmental Management (DOE-EM), the Department of Defense (DoD), and U.S. Air Force (USAF) bases across the nation.

Sigma Science provides nuclear safety solutions through:

- ◆ Provision of nuclear safety engineers, criticality safety engineers, fire protection engineers, and nuclear professionals.
- ◆ Performance of discrete nuclear safety, criticality safety, and fire protection development tasks and program improvements.
- ◆ Participation in nuclear safety, criticality safety, and fire protection review and assessment teams.

Capabilities

Founded in 1996, Sigma is a small, disadvantaged business with 80-plus full-time employees and access to more than 1,000 nuclear subject matter experts, engineers, scientists, and professional staff.

Safety Basis. Sigma's capabilities include development and implementation of Technical Safety Requirements (TSR), Documented Safety Analyses (DSA), Safety Analysis Reports (SAR), Nuclear Safety Analysis Reports (NSAR), Hazard Analysis Reports (HAR), and Probabilistic Risk Assessments (PRA) under DOE, NNSA, and DoD requirements, such as 10 CFR 830, DOE O 410.1, DOE O 413.3B, and DOE-STD-1189. This includes new nuclear facilities and existing facility updates, modifications, and recategorization.

Nuclear Criticality Safety. Sigma staff include nuclear criticality safety engineers and subject matter experts with capability to perform nuclear criticality safety evaluations, criticality parameter studies, and criticality parameter sensitivity studies.

Operational Readiness. Sigma staff participate in management assessments and operational readiness reviews, and provide conduct of operations mentoring, lessons learned, reviews, and assessments.

Fire Protection/Systems Engineering. Sigma staff develop Fire Hazard Analyses (FHAs); conduct initial condition assessments; support fire protection, alarm, and suppression system design and operations; conduct fire protection related design reviews; and support fire protection system upgrades.



In the last five years alone, Sigma Science has provided nuclear safety engineering services for: Los Alamos National Laboratory, Pantex Plant, Savannah River Site, Pacific Northwest National Laboratory, Oak Ridge National Laboratory, Sandia National Laboratories, USAF Nuclear Weapons Safety Center, USAF Global Strike Command, and USAF bases.

Sigma Contract Vehicles

- Honeywell Supply Chain Management Center Strategic Sourcing Agreement, WS190223, \$225M, October 2020 to September 2025
- Technical, Engineering and Programmatic Support Services Blanket Purchase Agreement III, \$400M, IDIQ, January 2023 to December 2027

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RELEVANT EXPERIENCE

DOE, NNSA, DOE-EM, DOE-SC Nuclear Safety

Sigma is currently providing or has recently provided nuclear safety, criticality safety, and fire protection engineering services at multiple sites around the DOE complex including under direct contracts to the federal government as well as subcontracts under prime contractors. These include services provided via task orders under our Supply Chain Management Center (SCMC) and Technical, Engineering and Programmatic Support Services (TEPS) II/III contract vehicles. Recent Sigma experience includes:



Image Source: NNSA Los Alamos National Laboratory

- ◆ **Los Alamos National Laboratory.** Sigma provides nuclear safety engineering, criticality safety, fire protection, and technical support to NNSA, DOE-EM, and Triad under multiple contracts with a combined value of nearly \$60 million. Services include risk and hazard analyses for nuclear facilities; provision/development of USQDs, DSAs, TSRs; fire protection engineering and system design; and provision of mentoring and training for site fire protection engineers. Nuclear facilities supported include Los Alamos Plutonium Pit Production Project; Radioactive Laboratory Utility Office Building; Waste Characterization, Reduction, and Repackaging Facility; Plutonium Science and Manufacturing Facility; Los Alamos Neutron Science Center; Radioassay and Nondestructive Testing; and Chemistry and Metallurgy Research Replacement. Sigma supported the recategorization of multiple nuclear facilities including upgrading and downgrading of safety basis.
- ◆ **Pantex Plant.** Sigma provided nuclear safety, criticality safety engineering, fire protection engineering, and conduct of operations support valued at more than \$9.2 million from January 2019 through September 2022. This included development and review of TSRs, DSAs, HARs, fire system upgrades, criticality safety reviews, and development of corrective actions to address Defense Nuclear Facilities Safety Board findings.
- ◆ **Savannah River Site.** Sigma provided nuclear safety and criticality safety engineers and subject matter experts in support of achieving Critical Decision-1 for the Savannah River Plutonium Processing Facility. Services were valued at \$2.4 million over three years (August 2019 to September 2022)
- ◆ **Sandia National Laboratories.** Provision of nuclear safety and engineering design review for Combined Radiation Environments for Survivability Testing since May 2021 and valued at more than \$5 million.
- ◆ **Oak Ridge National Laboratory.** Provision of technical and engineering services including nuclear safety engineering.

U.S. DoD Nuclear Safety and Fire Protection Services

Since 2020, Sigma has performed nuclear safety and fire protection services under multiple contracts supporting DoD including the Defense Threat Reduction Agency, USAF Global Strike Command, USAF Nuclear Weapons Safety Center, and USAF Ground Based Strategic Deterrent. Collectively, these contracts are valued at more than \$5.75 million. The primary scopes under these contracts include nuclear safety, engineering, and fire protections services. Sigma assists the USAF with Nuclear Safety Design Certification of nuclear Weapon Generation Facilities (WGF). Sigma has performed design reviews of WGFs at four USAF bases (F.E. Warren, Malmstrom, Barksdale, and Ellsworth); completed reviews of WGF FHAs and NSARs; produced the Ellsworth AFB WGF-F Nuclear Safety Analysis Report; developed FHAs for multiple USAF facilities; provided training on hazards analysis to the USAF Safety Center Weapons Safety Division staff; and completed the PRA for Barksdale WGF.

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Delivering technical expertise and innovative solutions.