SANDIA NATIONAL LABORATORIES

ProjectWise® used organization-wide to manage complex infrastructure documentation

For Sandia Corporation, a subsidiary of Lockheed-Martin Corp., operating and maintaining Sandia National Laboratories in Albuquerque, New Mexico, is similar to running a small town. The facility, which employs more than 7,000 people, encompasses about 1,000 buildings and structures spread across 9,000 acres, including associated utilities and infrastructure such as gas, electric, water, sewer, roads, sidewalks, parking, fences, and security boundaries.

Sandia National Laboratories operates the facility for the U.S. Department of Energy's National Nuclear Security Administration. Founded in 1949, the original mission was to provide engineering design for all non-nuclear components in the U.S. nuclear weapons arsenal. That work continues today, but its focus has broadened to include energy and national security projects.

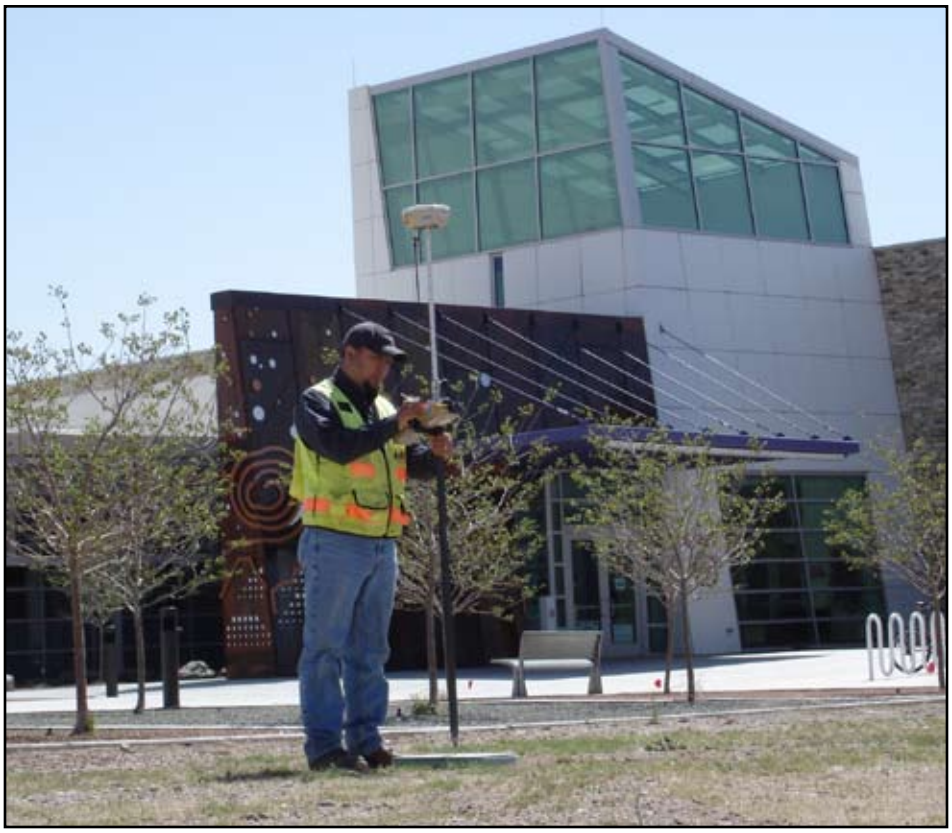
Sandia National Laboratories employs nine to 12 architectural/engineering firms to develop design changes on a project basis. It maintains close to 400,000 facilities record documents. Keeping these facilities records updated to reflect the ongoing work done by multiple parties proved a difficult task. In 2003, Sandia National Laboratories used an assortment of software products from different vendors to create CAD, geospatial, and building design documents. Working in a mixed environment, however, added to the difficulty of maintaining current and accurate as-built drawings.

For example, due to software limitations and internal workflow, as-built utility data was not reflected in the Sandia National Laboratories facilities geospatial information system (FGIS) until 180 days after project completion. Consequently, many projects would be under construction for 18 months and then would not appear in the FGIS for another six months. "Dig and outage permits were often issued based on outdated, inaccurate information, which put a greater burden on line spotters and system engineers to find the undocumented utilities," explained Mark Coffing, CADD technical lead.

Software limitations also allowed only one copy of any document to be checked out of the document management system. The number of buildings and ongoing projects meant that uncontrolled copies of documents were being used to develop project work packages. This, too, made it difficult to track facilities changes and to ensure that records were updated once projects were completed. In addition, smaller projects were often completed but had to be kept open until documents being used on other projects were updated and returned to the document management system.

With the goal of improving the accuracy of its documentation, as well as gaining efficiencies and saving money, Sandia National Laboratories decided

to standardize its geospatial tools, CAD drawings, and workflow processes. The Bentley product line offered the range of capabilities it needed for facilities management, and the products integrated well with each other. Other factors important to Sandia National Laboratories were the availability of on-site consulting and project management support, 24-hour technical support, commitment to regular upgrades, and an established training program.



Sandia National Laboratories worked with Bentley to develop a feature that enabled MicroStation® to merge the design history of two drawings and create a conflict table to help resolve any issues. This capability is particularly helpful when incorporating modifications done in multiple projects that pertain to a single record drawing. Sandia National Laboratories estimates that this feature alone cut in half the time needed to consolidate document changes to reflect as-built conditions.

MicroStation GeoGraphics® was chosen to maintain maps for the FGIS, and Sandia National Laboratories deployed ProjectWise to organize documents and control the document workflow. The firm also implemented new workflows to improve the accuracy and reliability of geospatial drawings. Project invoicing is now tied to current construction redlines. When an invoice is submitted, it is tracked in ProjectWise to ensure that GIS files are updated within five days.

"The time needed to receive and document as-built conditions in the FGIS went from 180 days after project completion to within five days of receiving a GPS request," said Coffing. "We are confident of the record documents accurately reflecting the conditions for new utility work under the surface."

Bentley® OnSite™ was integrated into the ProjectWise workflow for both FGIS files and for exterior and interior site project inspection, which gives field workers immediate access to the most current documentation. Workers can document any discrepancies they find between the documents and the as-built conditions. Bentley OnSite is also useful in helping maintenance workers find field equipment, especially in remote locations.

Previously, each Sandia National Laboratories project allocated 20 to 25 percent of the design cost to redlining the as-built conditions. The long time gap between actual construction and document updating practically guaranteed that record documents were out of date. With Bentley OnSite, walkdown conditions can be incorporated into the record documents right away. This capability has proved particularly helpful with interior inspections and surface site changes such as parking lots, street lights, and storm drains.

Sandia National Laboratories estimates that, as a result of its use of Bentley software, hundreds of thousands of dollars have been saved in the labor costs needed to keep documents accurate. Moreover, it has benefited from numerous intangible gains such as confidence in the accuracy of its GIS documents, timely incorporation of changes to documents, and safer working conditions for laboratory personnel.

"Projects are now turning in completed work because we have a mechanism to track when the work should be completed," said Coffing. "In addition, we have virtually eliminated damaging buried utilities because of not knowing what was under the ground." Damaging a buried utility could cost as much as $250,000 and create safety hazards for workers.

PROJECT SUMMARY

Organization
Sandia National Laboratories

Vertical market
Geospatial Government

Project Objectives
- Overhaul software tools and workflow processes to gain efficiencies and improve document accuracy
- Maintain documentation submitted in disparate formats
- Standardize geospatial tools, CAD drawings, and workflow processes

Fast Facts
- Sandia National Laboratories employs more than 7,000 people, encompasses about 1,000 buildings and structures spread across 9,000 acres. These facilities are operated on behalf of the U.S. Department of Energy's National Nuclear Security Administration.
- Nine to 12 architectural/engineering firms are employed by Sandia to develop design changes on a project basis. It maintains close to 400,000 facilities record documents.
- Sandia National Laboratories had been using an assortment of software products from different vendors to create CAD, geospatial, and building design documents.
- The Bentley product line offered the range of capabilities Sandia needed for facilities management, improving document accuracy, and has saved hundreds of thousands of dollars in labor costs.

Bentley Products Used
- MicroStation
- MicroStation GeoGraphics
- ProjectWise
- Bentley OnSite

BENTLEY®