

Lisa Eshelman  
CAD, GIS and Space Application Support Lead

Karen Henry  
Senior Software System Engineer

Sandia National Laboratories

# Enhancing the TRIRIGA user interface with GIS for space management across three Sandia Laboratory sites



Sandia National Laboratories is a multi-program laboratory managed and operated by Sandia Corporation, a wholly owned subsidiary of Lockheed Martin Corporation, for the U.S. Department of Energy's National Nuclear Security Administration under contract DE-AC04-94AL85000.



# Introductions

Lisa has 30 years of experience in the Architectural and Engineering Industry, 25 of those years working at Sandia National Laboratories. She is the IT support lead of Sandia's Facilities CAD, GIS, Space and Document Management Software. Lisa provides training, application, database and implementation support to more than 365 users and 17 various applications.

Karen has been with Sandia National Laboratories for more than 30 years which includes experience in general accounting, safeguards and security, facilities, and information technology. Karen's current assignment is supporting space and facilities assessment modules of Sandia's Facilities Management System, TRIRIGA.



# Overview

Sandia National Laboratories is a multi-program laboratory managed and operated by Sandia Corporation, a wholly owned subsidiary of Lockheed Martin Corporation, for the U.S. Department of Energy's National Nuclear Security Administration under contract DE-AC04-94AL85000. SNL uses TRIRIGA to manage approximately 7.6 million gross square feet (gsf) of property (owned, permitted, and leased space) at three major locations:

- SNL/New Mexico(SNL/NM)
- SNL/California(SNL/CA)
- SNL/Nevada(SNL/NV)- Tonopah Test Range

SNL implemented CAD Integrator using Bentley MicroStation® 5 years ago in TRIRIGA 9 on 868 drawing space files, and upgraded to TRIRIGA 10 to take advantage of the new graphics reporting features. We have leveraged the TRIRIGA space Management data to build a Facility Viewer Web Application using the ESRI 10.2 Platform.

# Agenda

- Sandia's Space Management
- TRIRIGA Data Integration with ESRI Platform
- Design Overview
- Database Overview
- Application Overview
- Demo

# TRIRIGA and Sandia Space Management

Tracking and reporting space at Sandia has become easier with the implementation of our Facilities Management System, TRIRIGA. On a daily basis space data changes are updated and recorded in TRIRIGA and square footage is recorded/updated with the help of TRIRIGA CADD Integrator.

In order to achieve this we had to:

- Identify all space by type including common space
- Identify all owners of space by organizations
- Identify Corporate shared space
- Integrate with PeopleSoft
- Integrate with our Corporate financial system
- Set capacity values for office type space

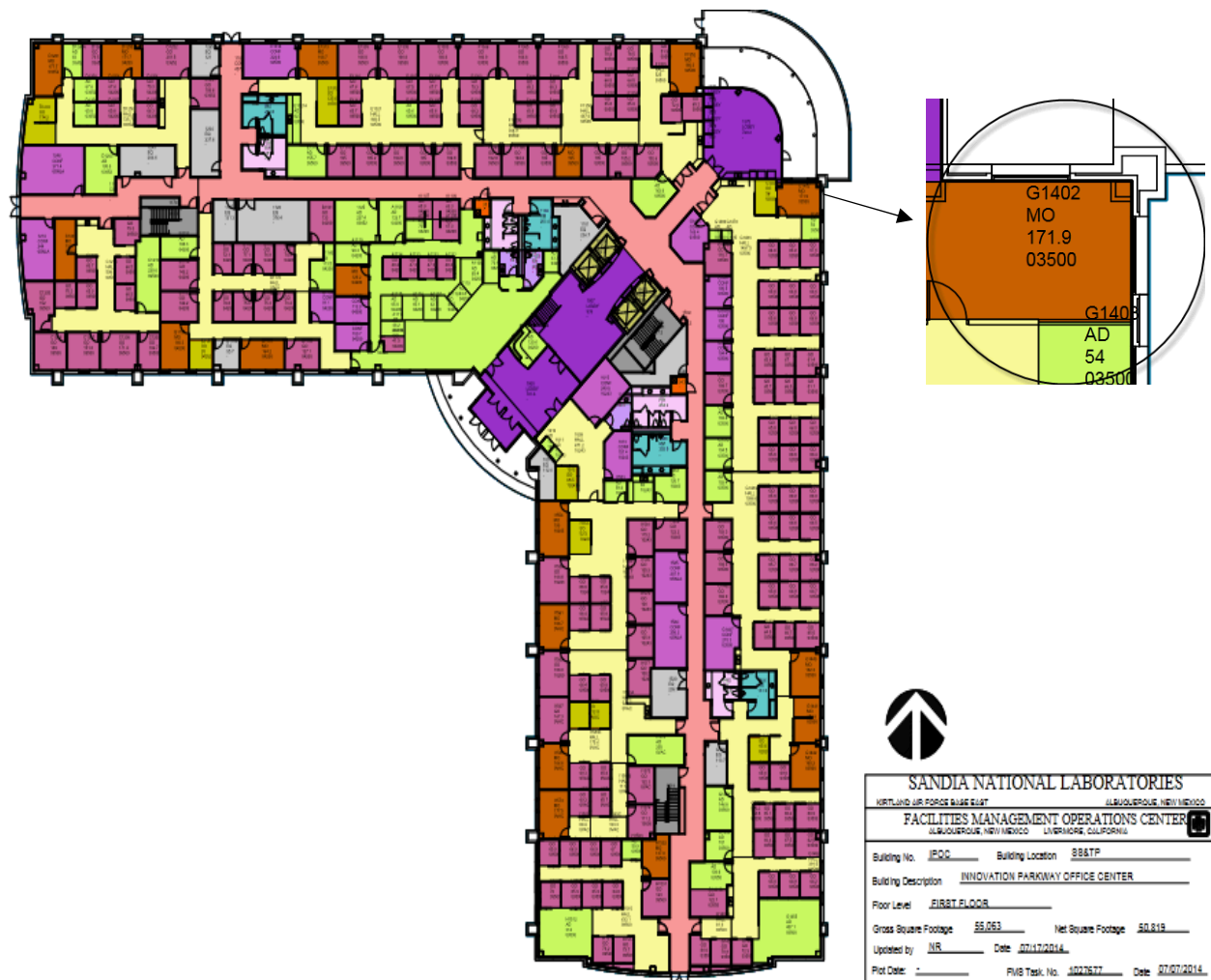
# TRIRIGA and Sandia Space Management

## Results:

- Improvements to the overall space utilization of our facilities by having the ability to reassign space to others as soon as it becomes available
- To quickly review capacity at any level (Site/Building/Room)
- To generate space reports at any level
- To review space graphically with use of graphical queries
- The automation of our monthly space audit cost recovery billing process
- Data becomes available for other integrations.....ESRI



# TRIRIGA and Sandia Space Management



Space Type	
Name	Area
Administrative	6311.6
Chase	133
Conference Room	2725.5
Corridor	5189.9
Elevator Shaft	316.6
Equipment Room	2041.8
General Office	13835.9
Hall	11335.7
Janitor Closet	70.1
Lobby	2515.3
Manager Office	2915.2
Mens Restroom	847.6
Restroom	242.3
Secretarial Office	866.4
Stair	673.9
Womens Restroom	797.8
Total	50818.6

# TRIRIGA/ESRI Integration

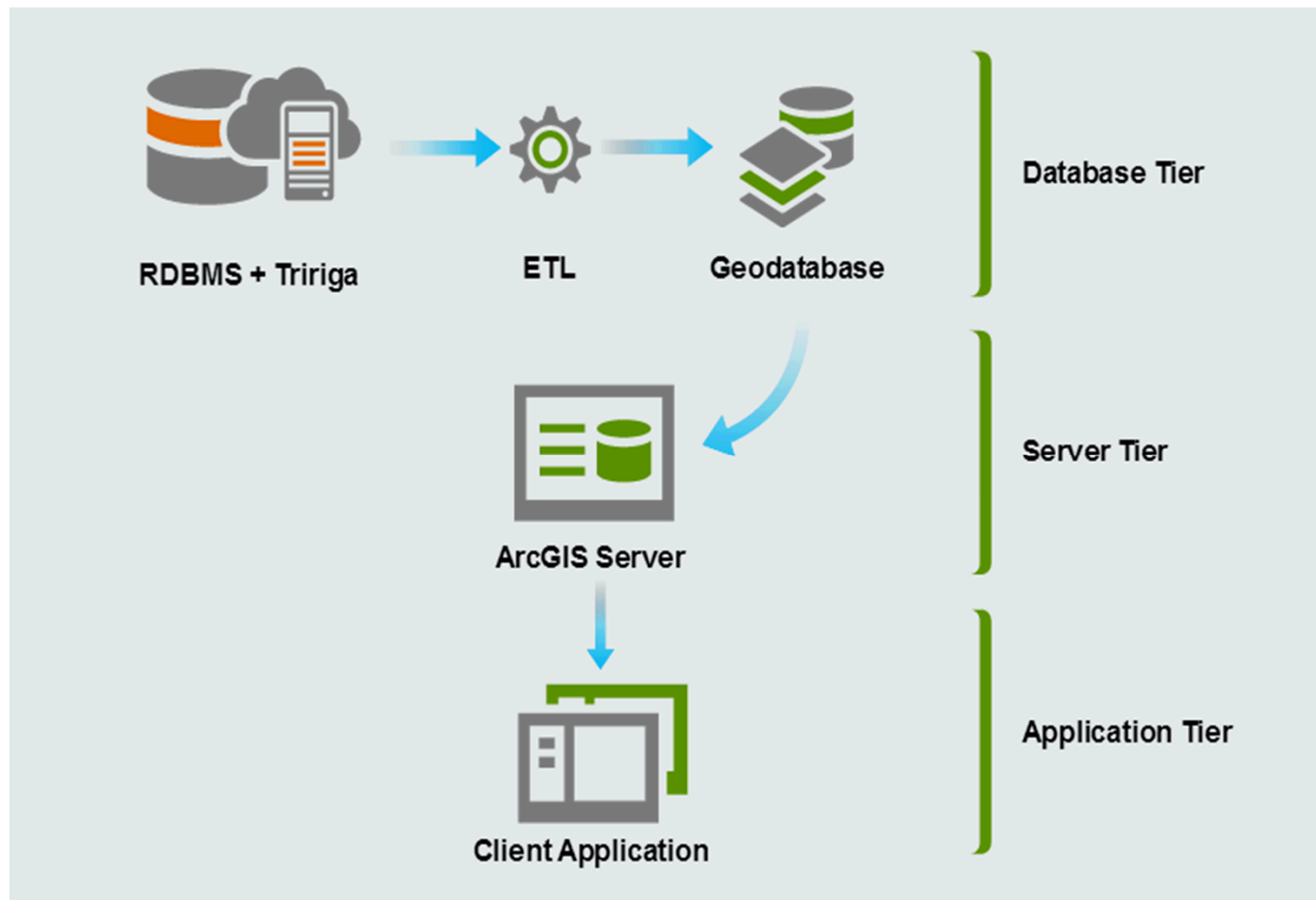
- Leverages an Oracle based Geodatabase as a repository to maintain spatial data that consists of layers representing Sandia campus, buildings, people/staff, ESH incident data and CAD drawings of floor plans.
- This source data originates from Sandia's IBM TRIRIGA Facility Management System and Sandia's internal incident reporting database.
- Includes ETL scripts that transformed and loaded data into the Oracle geodatabase.
- Spatial data made available for querying and map generation by publishing ArcGIS map services for application development
- Developed with the ESRI JS App Builder



# Design Overview

- **Goals:**
  - Highly Available
  - Scalable
  - Flexible
  - Extensible
  - Intuitive
  - Locate
    - Buildings
    - Rooms
    - People
    - ES&H Incidents

# System Architecture



# Database Overview

- **Spatial Layer**
  - ETL Process
- **Ancillary Data Load**
  - Campus Shape Files
- **CAD Data Load of TRIRIGA CAD Files**
- **Oracle Geodatabase**
- **Web Services**
  - mxd file

# Web Services

- **Map Services**
  - Tiled
    - Base map Layers
    - SNL Campus Base map
  - Dynamic
    - Operational Layers
      - Buildings
      - People
      - Rooms
      - Incidents
- **Feature Services**
  - None
- **ArcGIS Hosted Services**
  - ArcGIS Online base maps
    - US Streets
    - Imagery with Labels

# Application Overview

## Facility Viewer Application

### User Interface

### Functionality

- Pan , Zoom Base Map Selection

- Bookmarks

- Search

- Results

- Floor Selector

- Entity Details

- Related Info Tabs

- Print

- Legend

# Demo



---

# Questions?

# NEXT STEPS

## SANDIA Roadmap: FUTURE Projects:

1. Routing
  - Building
  - Room
2. Gate Search
3. Lab Assessment
4. Chemical Tracking
5. Maintenance (Maximo) Integration
6. Facilities Operational Mapping

# Contact Information

Lisa Eshelman  
(505)-844-0162  
leshel@sandia.gov

Karen Henry  
(505)844-1471  
klhenry@sandia.gov