

# Sandia National Laboratories Site Report, 1520 Operations

JOWOG 39 AWE Aldermaston, UK  
NDE and associated Technologies

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Sandia National Laboratories  
Experimental Mechanics, Non-Destructive Evaluation, & Model  
Validation Department

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.



# About SANDIA

## Locations

Albuquerque, NM

Livermore, CA

Kauai, HI

Tonopah, NV

## Budget

Operations & maintenance


FY12

\$2.4 billion

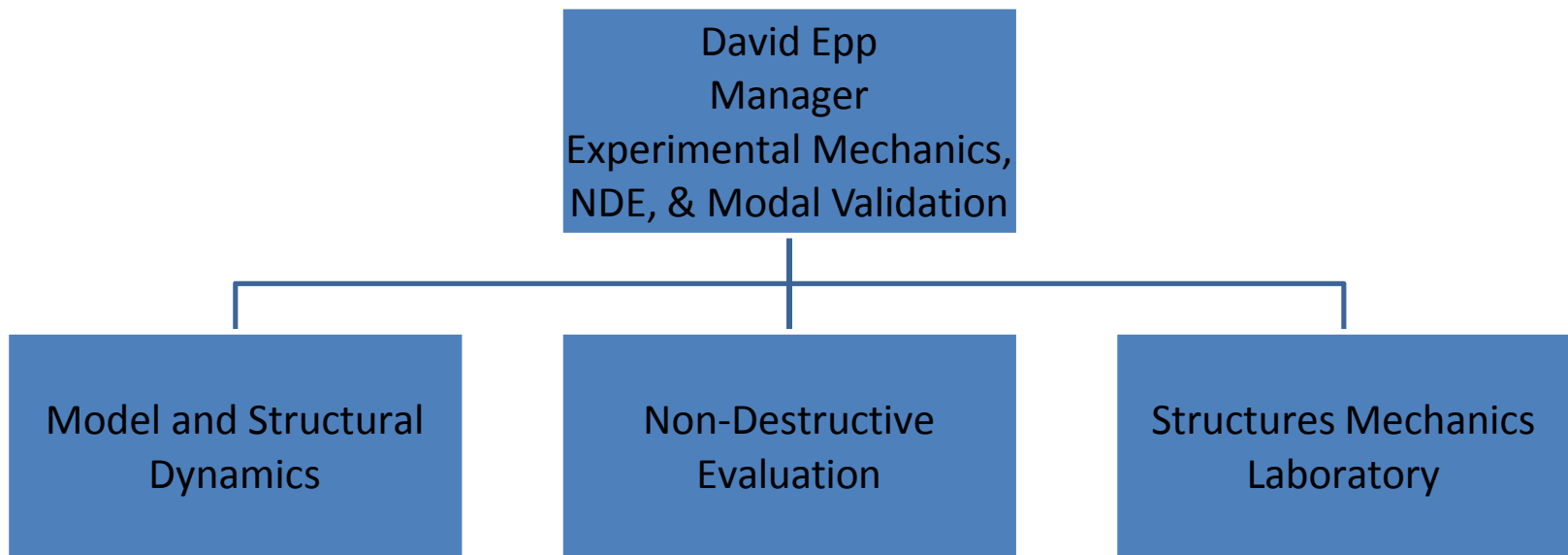
## Employees

~8700

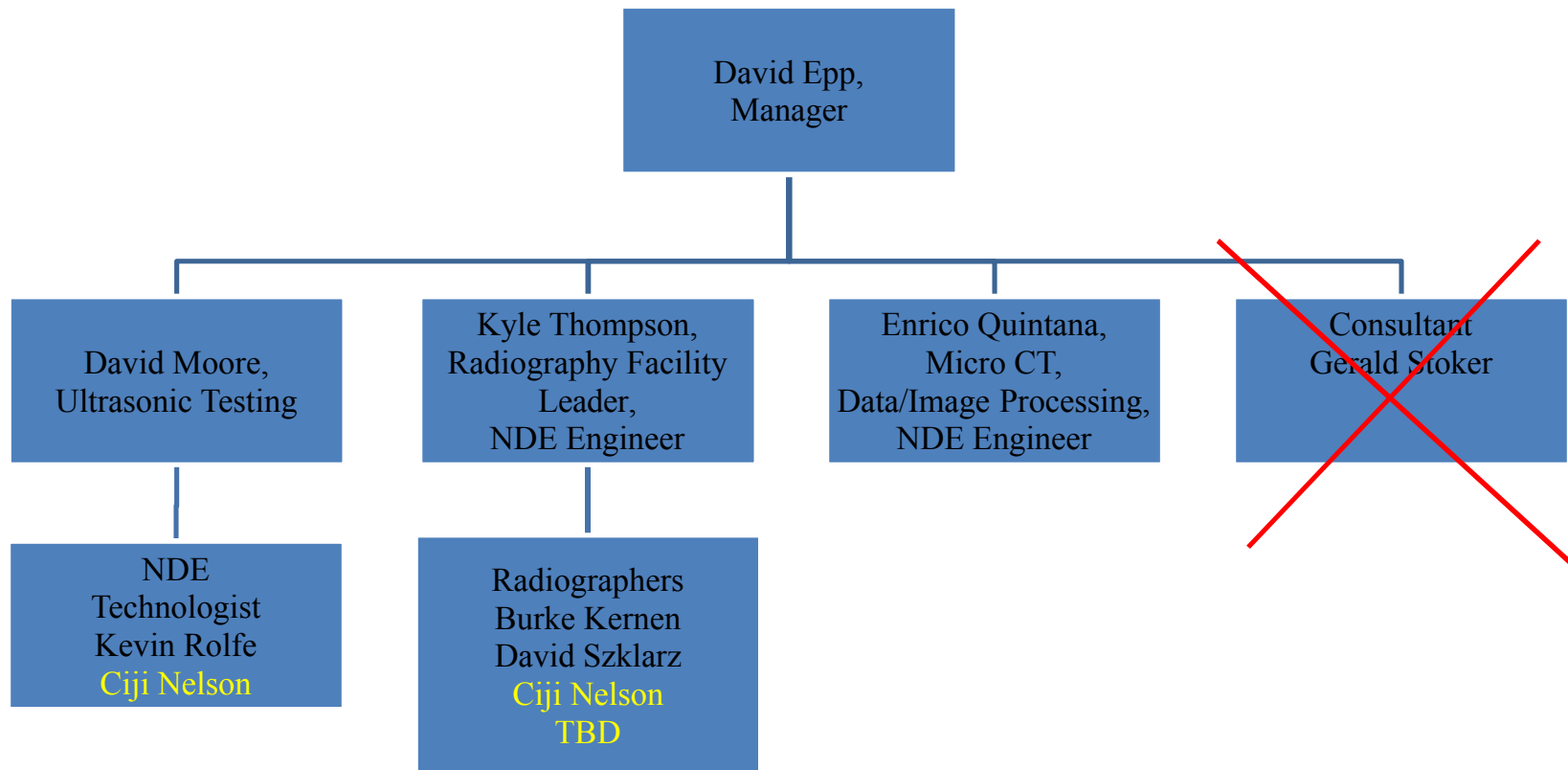
<http://www.sandia.gov/about>



# Experimental Mechanics, Non-Destructive Evaluation, & Modal Validation Department 1522



# Non-Destructive Evaluation Organization





# Non-Destructive Evaluation (NDE) Personnel Changes

Jean Sena – Retired

Joe Romero – Hired and changed Jobs

Jerry Stoker – Re-retired

Burke Kernen – Hired

David Szklarz – Transferred to NDE

Ciji Nelson – Transferred to NDE

In process of hiring an additional technologist



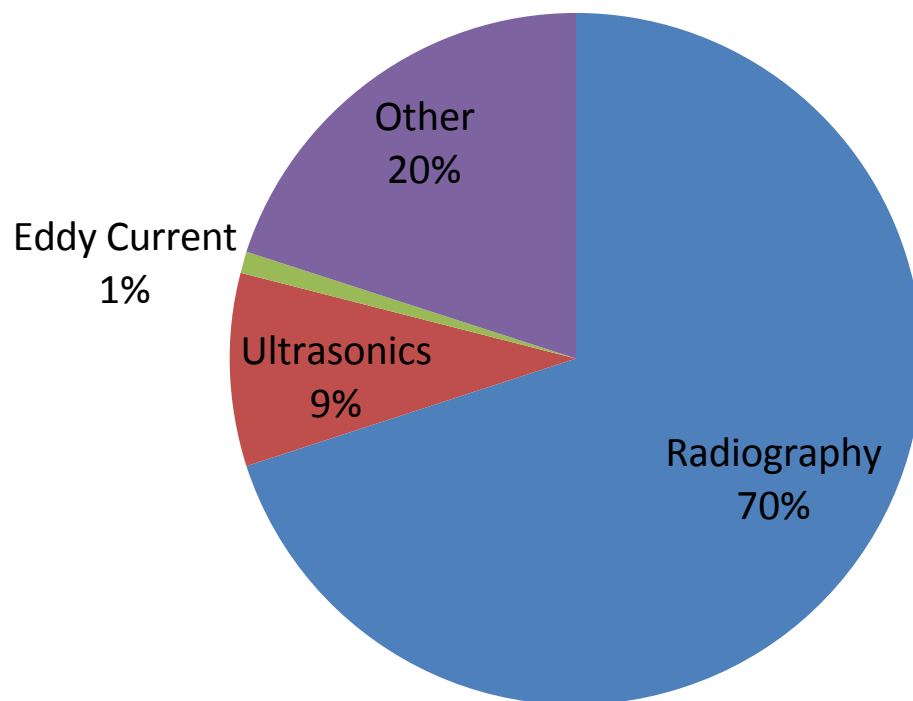
# Non-Destructive Evaluation (NDE)

- NDE Includes a suite of technologies
  - Radiography
  - Computed Tomography
  - Ultrasonic Diagnostics
  - Eddy Current Testing
  - Infrared Imaging
- Applications
  - Research and Development
  - Quality Control, Failure Analysis, & Testing Diagnostics
  - Reverse Engineering
  - Non-Visual Dynamic Event Monitoring



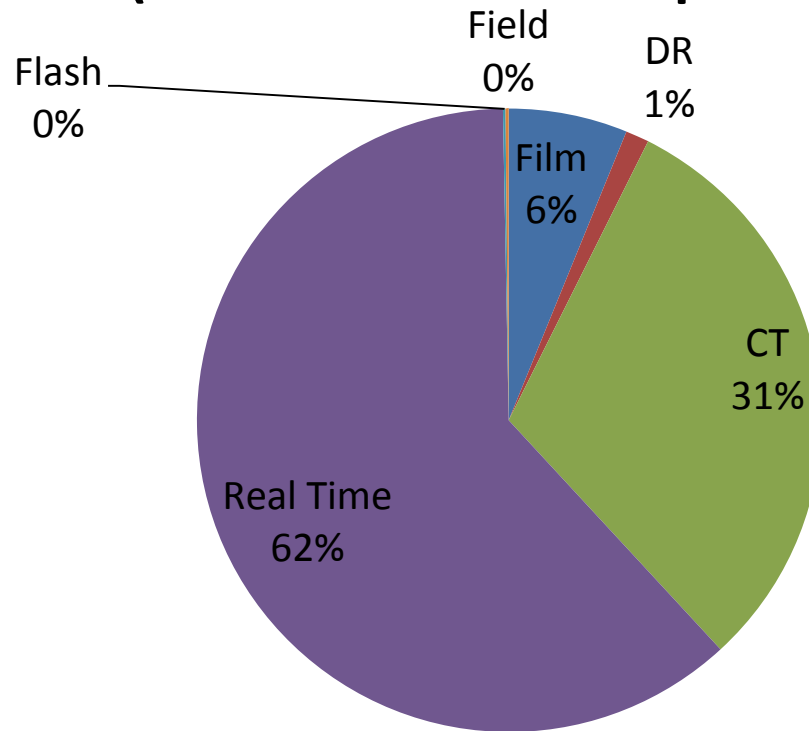
# Non-Destructive Evaluation (NDE)

## Estimated NDE Work Breakdown

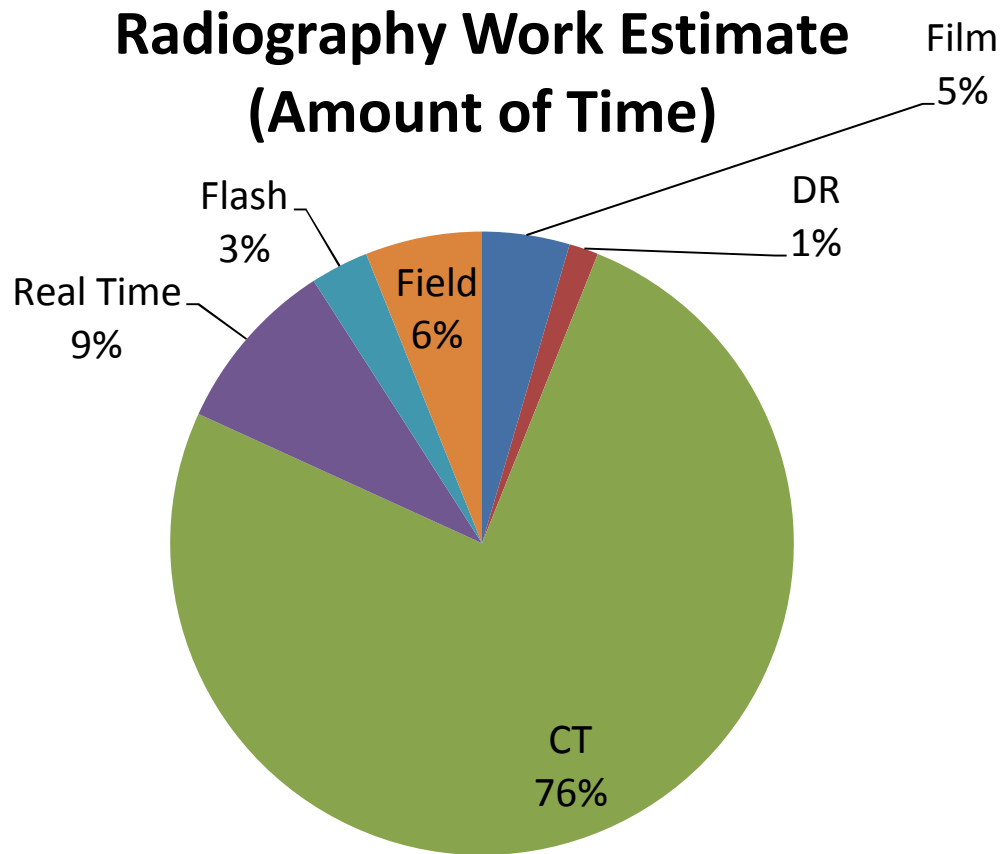


# Non-Destructive Evaluation (NDE)

## Radiography Work Estimate (Number of Parts Inspected)



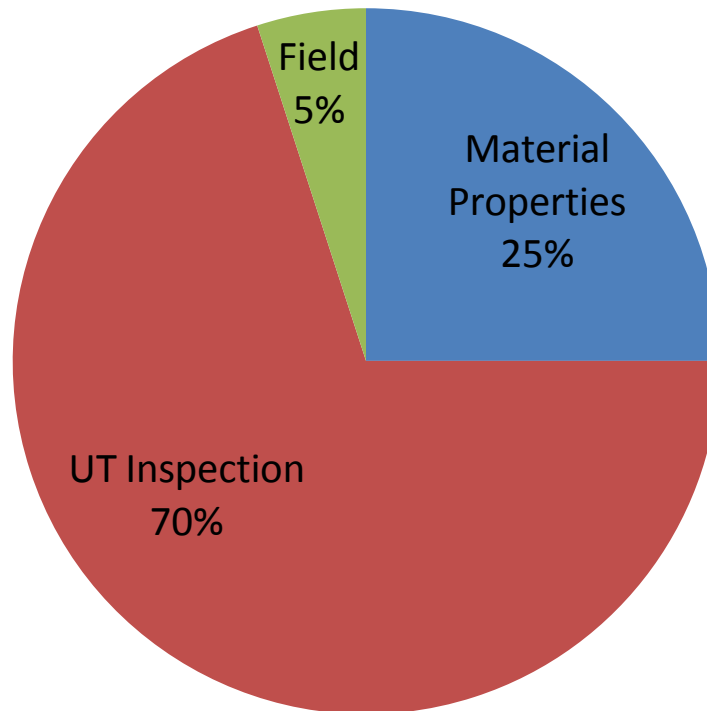
# Non-Destructive Evaluation (NDE)





# Non-Destructive Evaluation (NDE)

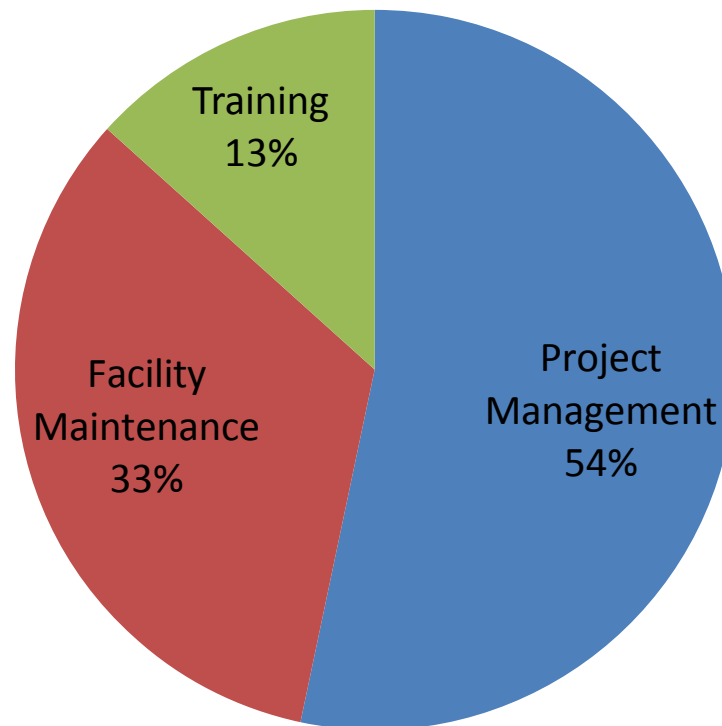
## Ultrasonic Work Estimate





# Non-Destructive Evaluation (NDE)

## Other





# Radiographic Equipment Changes

- Equipment Failures
  - 2 ea Varian 2520 panels, 1 ea Varian 4030 panel
  - 1 ea Varian 2520, 1 ea Varian 4030HE (partially functional)
  - 2 ea Philips 450 kVp machines
  - 1 ea Philips 420 kVp machines
  - 2 ea Philips 225 kVp machines
  - 1 ea 160 kVp microfocus machines
  - 1 ea 225 kVp microfocus machines
  - 3 ea CT acquisition software systems
- Equipment no longer supported
  - 10 ea CCD cameras (3 ea 3Kx2K, 3 ea 1Kx1K, 1 ea High speed, 3 ea integrating RS-170)
  - 4 ea CT reconstruction/visualization software systems



# Radiographic Equipment Changes

- Equipment Replacements
  - 2 ea Varian 2520V panels
  - 3 ea Perkin Elmer panels
  - 1 ea Dexela CMOS panel (currently non-functional)
  - 2 ea 450 kVp machines
  - 2 ea 225 kVp microfocus machines
  - 3 ea NSI CT acquisition software systems
  - 2 ea 3Kx2K cameras
  - 5 ea CT reconstruction/visualization systems



# Ultrasonic Equipment Changes

- Equipment no longer supported
  - 1 ea UT small tank scanning systems
  - 1 ea UT medium tank scanning systems
  - 1 ea UT large tank scanning systems
- Replacement Equipment
  - 1 ea MAUS tankless scanning system



# Areas of Collaboration

- Digital X-ray Process development
- Digital Radiography across the NW Complex
- CT Reconstruction Software
- NDE-CAT
- High Energy Radiography
- CR Technique development
- UT MAUS implementation
- IR technique development
- NDE supporting model validation



# Future Outlook

- NDE will provide increasing support to Sandia's Development, and Surveillance
  - More frequent and diverse utilization of NDE
  - Emphasis on Responsive Infrastructure
- Increasing demand for R&D of new diagnostics supporting large scale testing
  - Quantitative, three dimensional, time resolved data
- Increasing Diagnostic Support of Model Validation
  - Material Characterization (UT and CT)
  - As-build geometry capture
- IR imaging growth area
  - Potential for new application of IR technologies in NDE (new cameras, lower cost, faster acquisition)
- Production Support Role Mostly Troubleshooting
  - Consulting for existing production NDE systems
  - NDE for processes and equipment supporting production activities
- CT Applications Expanding Rapidly
  - The amount of CT inspections requiring full 3D scanning has increased substantially
  - Data processing software/hardware has seen > 10x performance gain
  - Data Storage and Data Processing activities increasing
- Decrease in Demand for traditional NDE Services (Film Radiography)  
Transitioning to digital technologies