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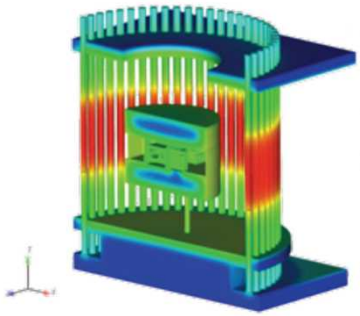
FIRE SCIENCE AND TECNOLOGY

RADIANT HEAT TEST CELL

A KEY CAPABILITY FOR NUCLEAR WEAPON ASSURED SAFETY



Use of highly controlled heaters and precision diagnostics to measure thermal response of nuclear weapon safety systems
Goal is to assess the performance of safety critical components and evaluate system design in abnormal thermal environments
Energy storage device must fail irreversibly before either safety component is compromised

Primary Purpose

Testing of Component, Subsystem, and Systems to support Thermal Qualification and Model Development and Validation

Controlled Radiative and Convective Heating
Testing Facilities include Radiant Heat, FLAME, and XTF test cells

Voltage	up to 12 Conductor 480VAC
Amperage	1000/leg
Phase	3

5.2 MW Radiant Heat Test Cell for performing high heat flux experiments

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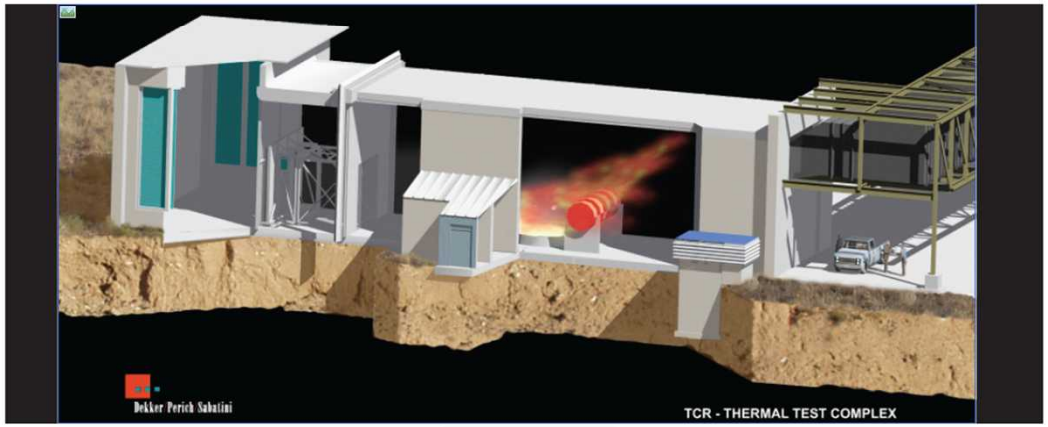
FIRE SCIENCE AND TECNOLOGY

CROSS-WIND TEST FACILITY



Primary Purpose

Testing of Component, Subsystem, and Systems to support Thermal Qualification and Model Development and Validation Fires in Crosswind conditions

Maximum Fuel Fire	20.0 MW
Maximum Radiant Test	2.8 MW
Maximum Explosive Load	106 lb equivalent TNT
Airflow Inlet	8500-170,000 scfm

The Cross Flow Fire Test Facility, or XTF, is a 25-ft-high by 25-ft-wide by 84-feet long facility that is an indoor "fire wind tunnel" for testing objects with hazardous components (including explosives) at wind speeds up to 20 mph. Built with 30-inch reinforced concrete walls and special refractory concrete, the XTF also has radiant heat test capabilities.

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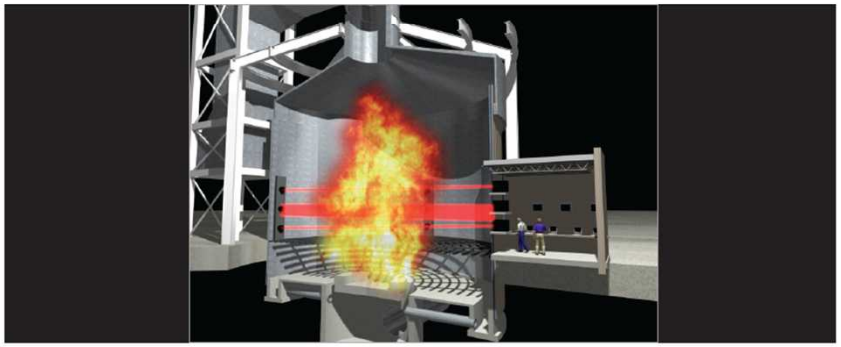
FIRE SCIENCE AND TECNOLOGY

FIRE LABORATORY FOR ACCREDITATION OF MODELS AND EXPERIMENTS (FLAME)



State-of-the-Art facilities and diagnostics for fire environment characterization

Primary Purpose

Testing of Component, Subsystem, and Systems to support Thermal Qualification and Model Development and Validation
Controlled Fires in Quiescent Conditions, Controlled Radiative and Convective Heating

Test Facility Size (approx.)	50 ft. high x 60 ft. diameter
Maximum Fuel Fire	20.0 MW
Maximum Fire Test Duration	1 hour
Airflow	150,000 scfm inlet
Maximum Radiant Test	5.2 MW

Quiescent (calm) wind fire experiments are performed in the 60-foot diameter FLAME test cell that has water-cooled walls and well controlled/characterized airflow equipment. Laser diagnostic equipment is used in the cell to help understand the burning process. Systems to allow jet fuel, methanol, and other liquid fuels as well as hydrogen, methane, and other gas fuels are part of the design.

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FIRE SCIENCE AND TECHNOLOGY

SANDIA THERMAL TEST COMPLEX
THERMAL ENVIRONMENTS TESTING AND ANALYSIS

Nuclear weapons are qualified to perform in normal and abnormal thermal environments.

- Normal environments: remain safe and maintain full operability
- Abnormal environments: remain safe but not operable

Normal Environments

Abnormal Environments

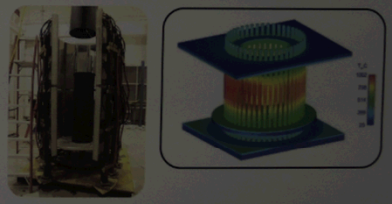
Fire Laboratory for Accreditation of Models and Experiments (FLAME)

- Precision simulated fire environments for thermal response modeling
- Custom radiant heater designs
- Simulated fire environments that are well-controlled and repeatable allow for assessment of weapon and component thermal response

Cross Wind Test Facility

- Fire characterization in high turbulence (crosswind)
- Pool fires in crosswinds represent the most severe thermal environment

Radiant Heat Test Cell



- Fire Characterization in calm (ideal) conditions
- Validated fire models are used to explore accident environments

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