

This paper describes objective technical results and analysis. Any subjective views or opinions that might be expressed in the paper do not necessarily represent the views of the U.S. Department of Energy or the United States Government.

SAND2018-12955C

# Extreme Engineering at Sandia

Carol L. Adkins - *Director*, Secure Energy  
& Earth Systems Program

University of New Mexico - November 14, 2018



Sandia National Laboratories is a multimission laboratory managed and operated by National Technology & Engineering Solutions of Sandia, LLC, a wholly owned subsidiary of Honeywell International Inc., for the U.S. Department of Energy's National Nuclear Security Administration under contract DE-NA0003525.

# Energy is Integral to National Security



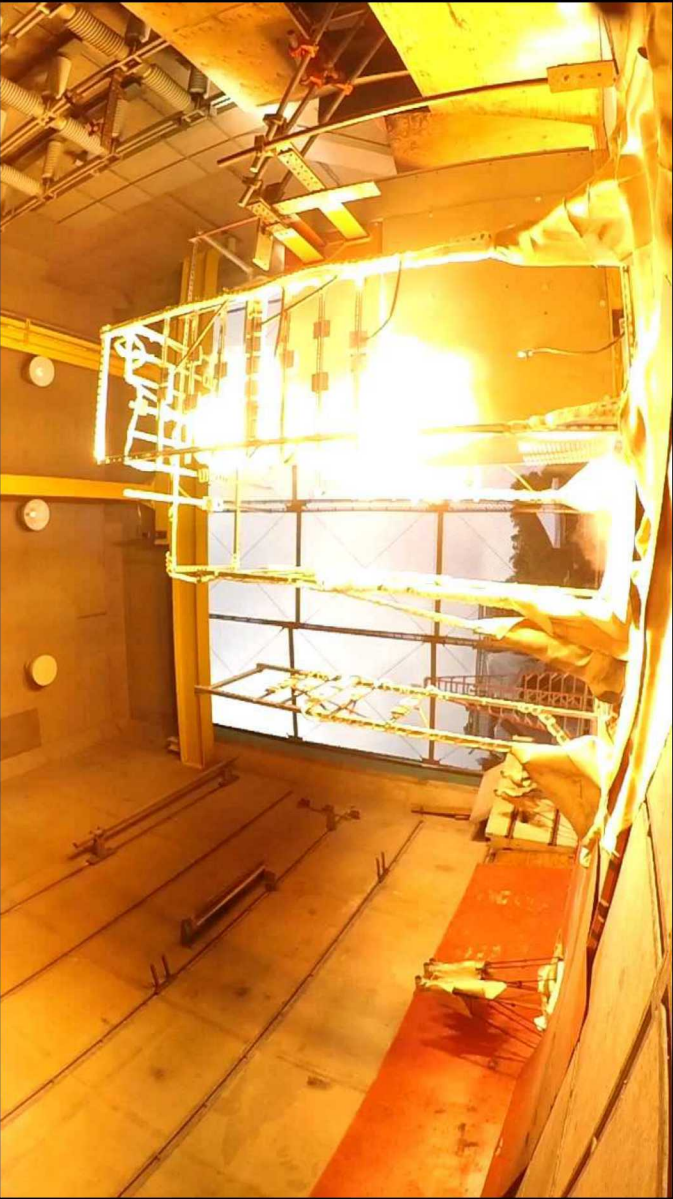
Russian Hackers Are Attacking the U.S. Energy Grid  
(Time, March 2018)

After Hurricane Maria, Puerto Rico's  
Grid Needs a Complete Overhaul  
(Science, September 2017)

North Korea Blamed for Nuclear-  
Power Plant Hack (WSJ, March 2015)

Power Grid Cyber Attacks Keep the Pentagon Up  
at Night (Scientific American, June 2015)

Cyberattacks Surge on Energy Companies, Electric Grid  
(U.S. News and World Report, April 2016)





**Nuclear Reactor Safety**

# Extreme Climates

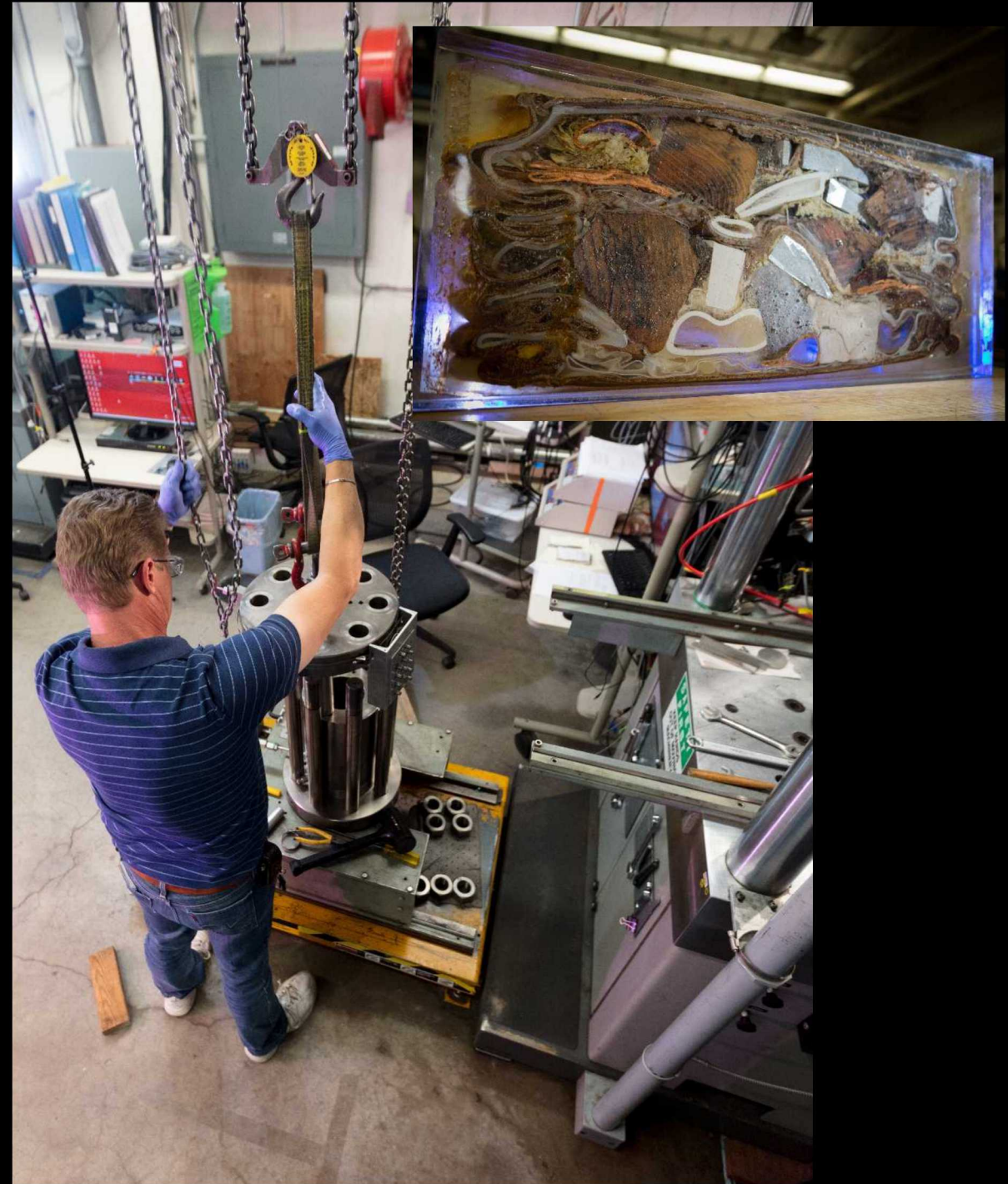




## Transportation and Liquid Natural Gas Safety

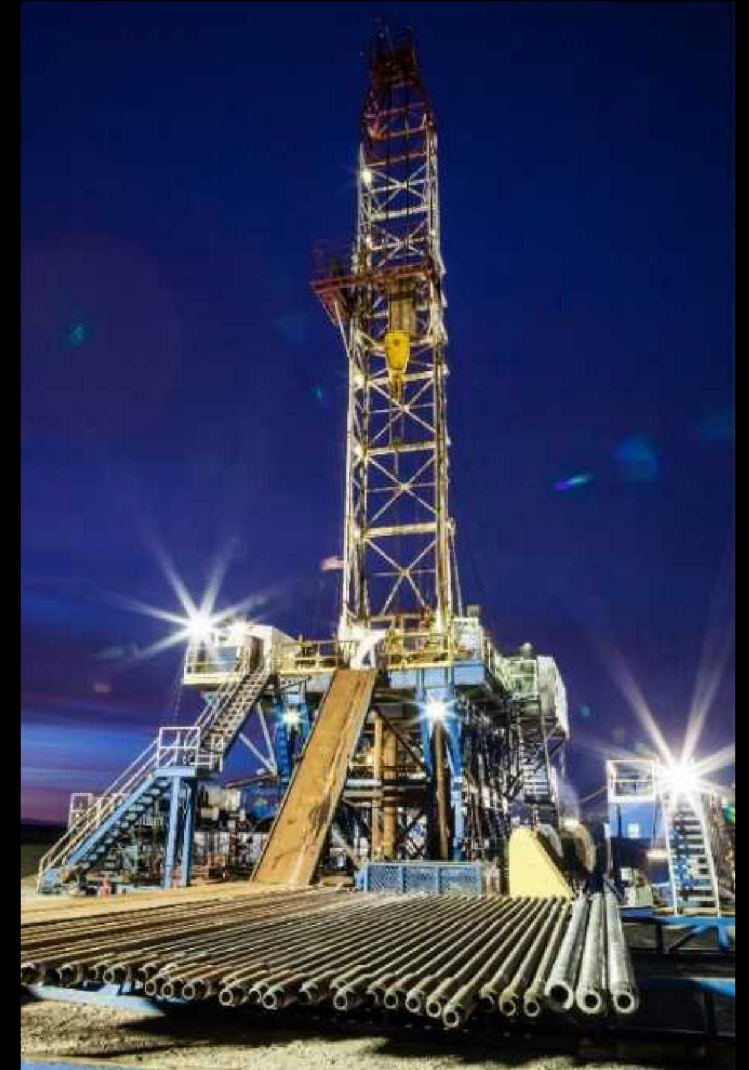
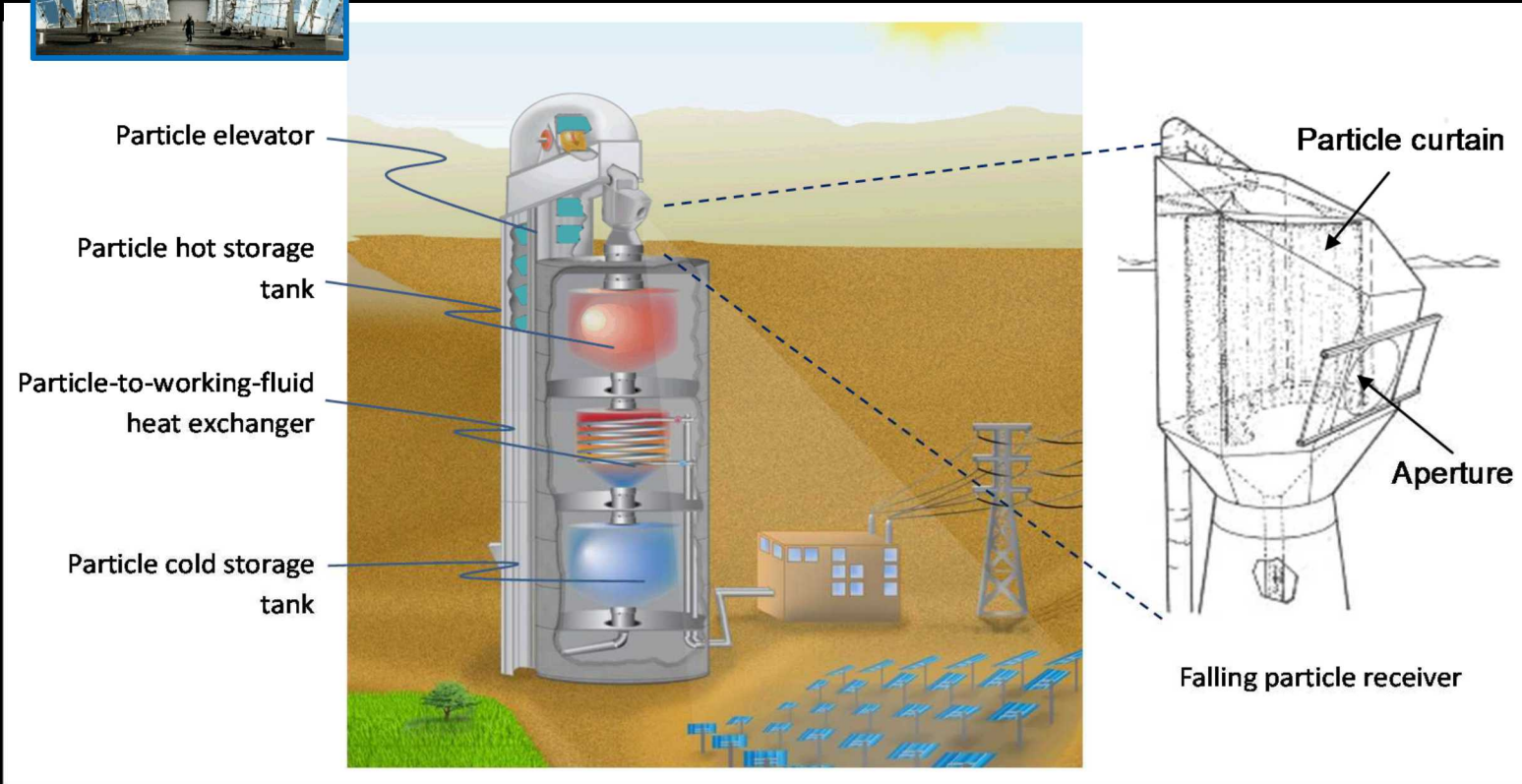


# Extreme Pressures and Temperatures





# Falling Particle Receiver for Concentrated Solar Power



**Extreme Engineering for Renewable Energy**