

LA-UR-20-25599

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Title: Nuclear Security Enterprise (NSE)

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Intended for: Nuclear Fundamentals Orientation (NFO)

Issued: 2021-10-21 (rev.2)

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Nuclear Fundamentals Orientation

Module 1

Nuclear Security Enterprise (NSE)



Managed by Triad National Security, LLC for the U.S. Department of Energy's NNSA

Nuclear Security Enterprise



Presentation Overview:

- Current NSE
 - NNSA
 - Design Labs
 - Los Alamos, Livermore, Sandia
 - Production Plants
 - Y-12, Pantex, KC, SR, Los Alamos
 - Complex Challenges
 - Future Vision
- Questions and Answers

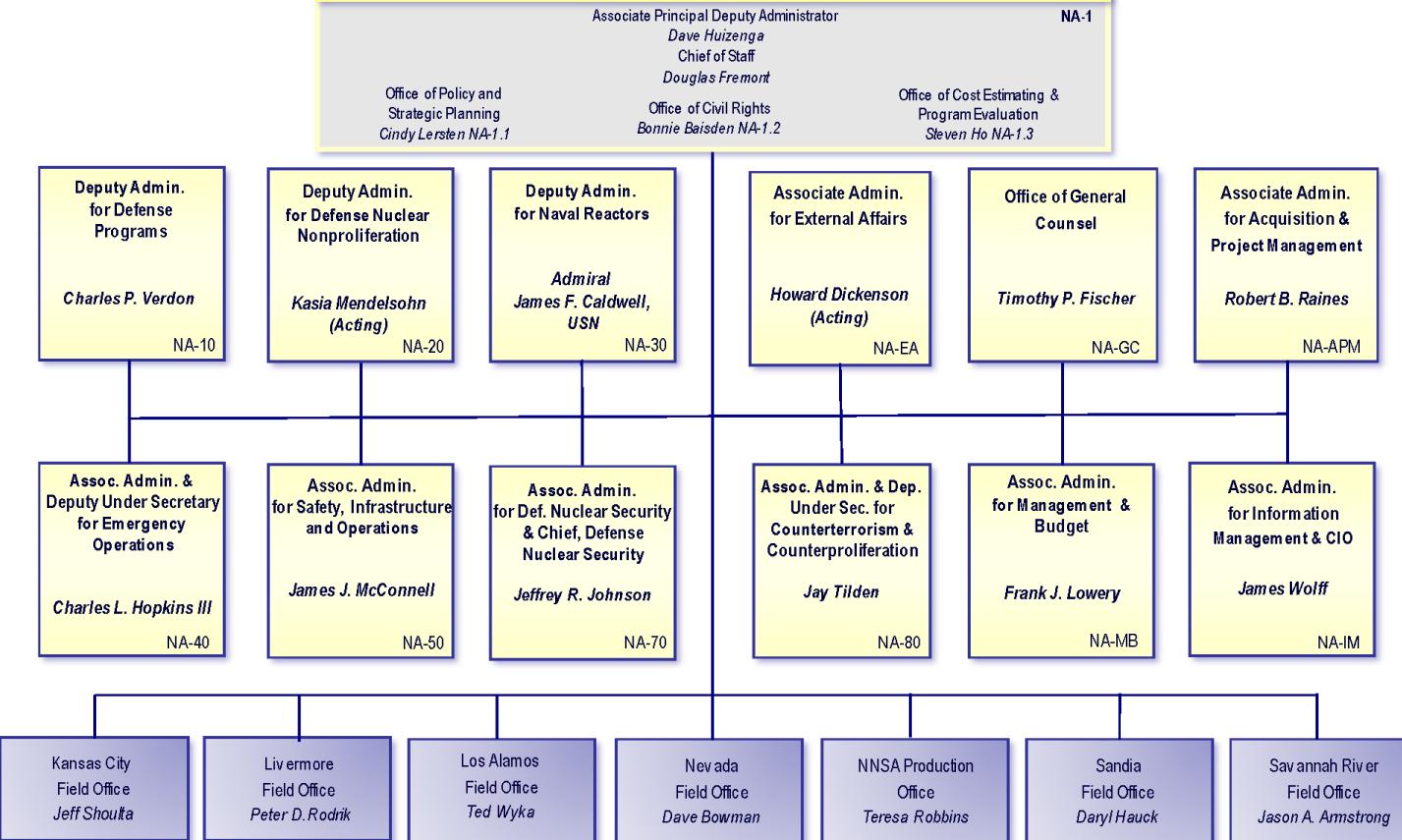
Today: NNSA and DOE



Under Secretary for Nuclear Security & Administrator, NNSA Jill Hruby



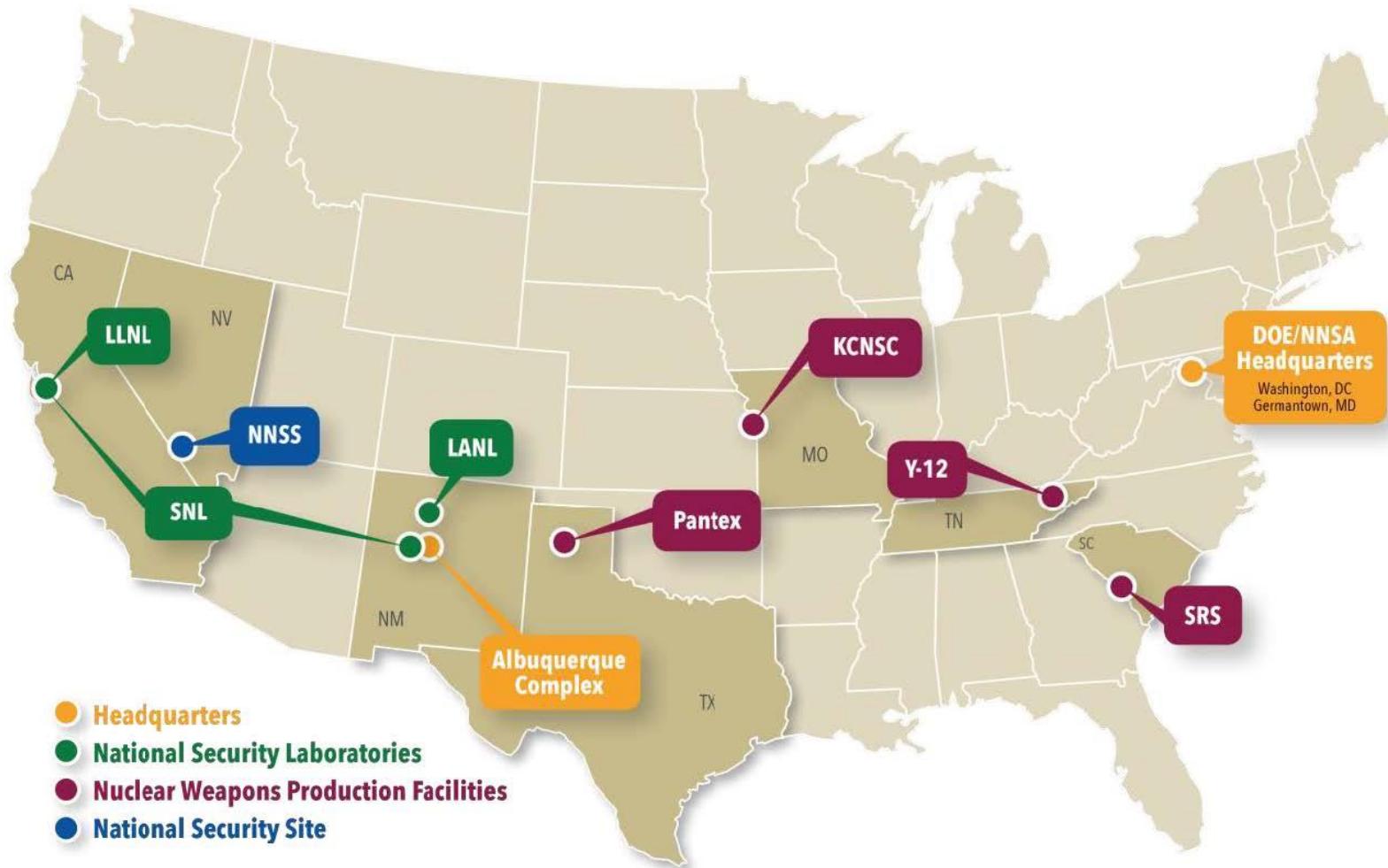
Principal Deputy Administrator Frank A. Rose



August 2021



Today: Current Complex



KCNSC = Kansas City National Security Campus
LANL = Los Alamos National Laboratory
LLNL = Lawrence Livermore National Laboratory

NNSS = Nevada National Security Site
Pantex = Pantex Plant
SNL = Sandia National Laboratories

SRS = Savannah River Site
Y-12 = Y-12 National Security Complex

Today: NSE Complex

Los Alamos National Laboratory



Lawrence Livermore National Laboratory



Sandia National Laboratories



Kansas City National Security Campus



Federal government (DOE/NNSA), with input from labs and plants, provides scope & budgets to these organizations every year, creating an environment of cooperation and competition

Y-12 National Security Complex



Savannah River Site



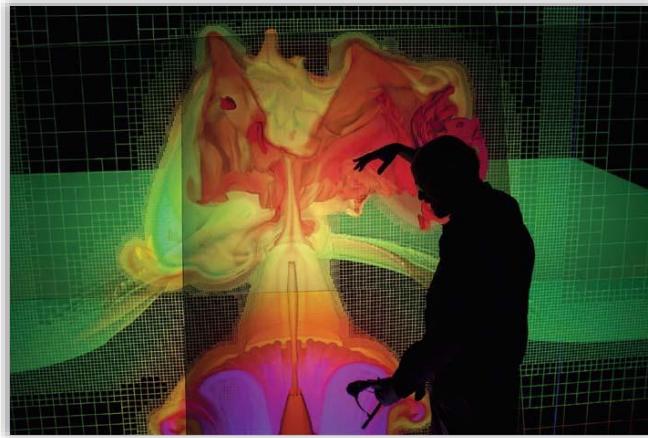
Pantex Plant



Nevada National Security Site



Today: Design Agency and Production Agency



DESIGN

LANL

LLNL

SNL

PRODUCTION

LANL

KCNSC

SRS

Y-12

Pantex



Lawrence Livermore National Laboratory (LLNL)



- Livermore, California
- Multi-Program National Security Laboratory
- Design Agency for NEP
- Surveillance
- Home of NIF



LLNL TIMELINE

Sandia National Laboratories (SNL)

- Albuquerque, NM
- Design Agency for non-nuclear components
- Production Agency for neutron generators and electronics fab
- Integration



Y-12



- Oak Ridge, TN
- Uranium & other components

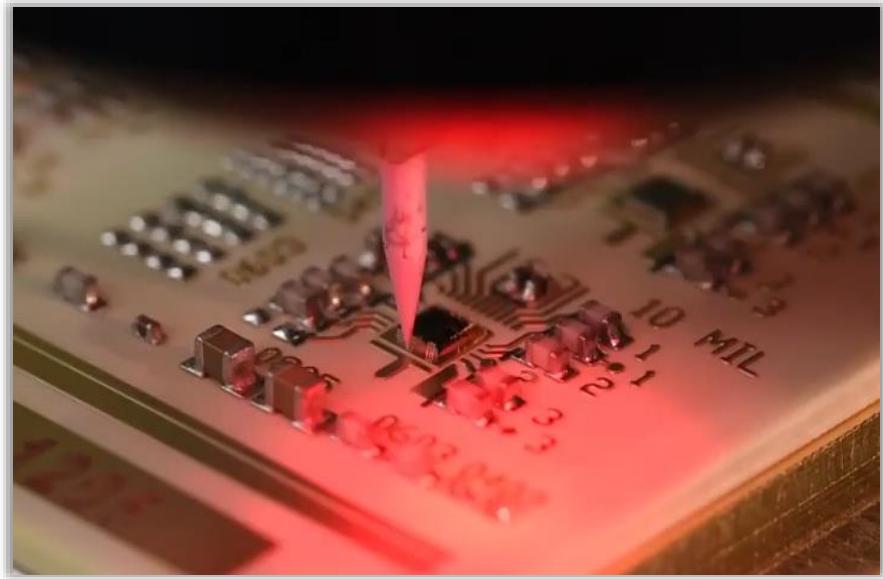


Savannah River Site (SRS)

- Tritium & gas-transfer systems
- Future pit production mission, together with Los Alamos



Kansas City National Security Campus (KCNSC)



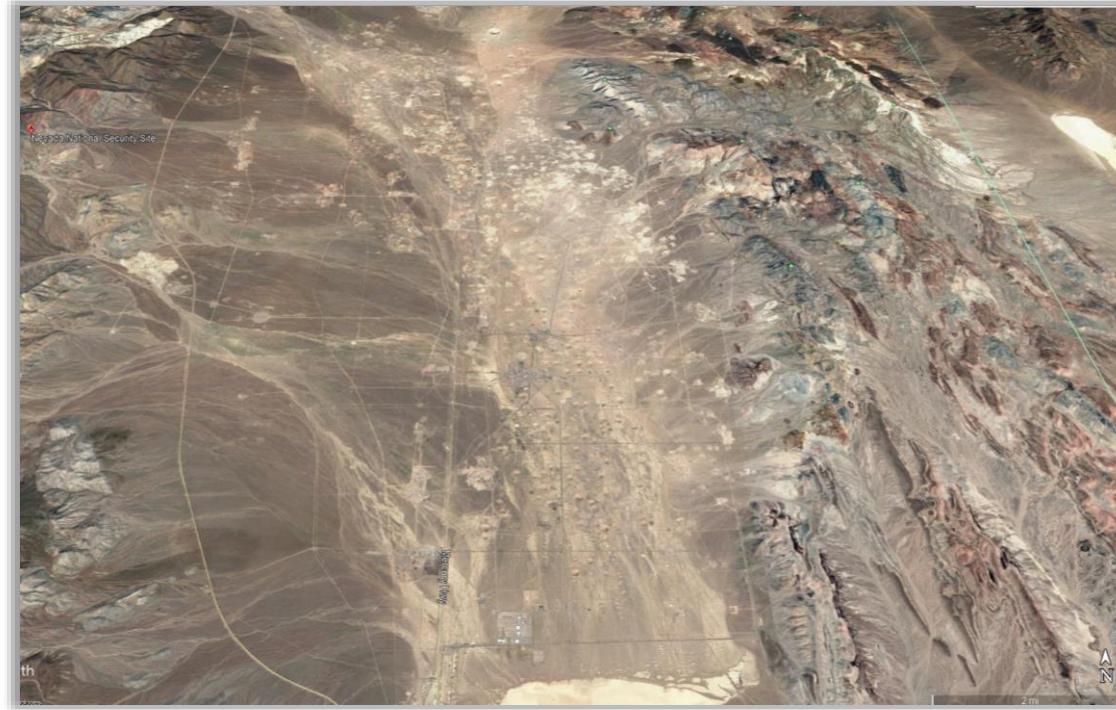
- Kansas City, MO
- Production Agency for non-nuclear components

- Amarillo, TX
- Weapons Production
- Stockpile Surveillance
- High Explosive Manufacturing



Nevada National Security Site (NNSS)

- Integrated subcritical plutonium experiments
- High-hazard work
- “Exercises” involving counter-terrorism



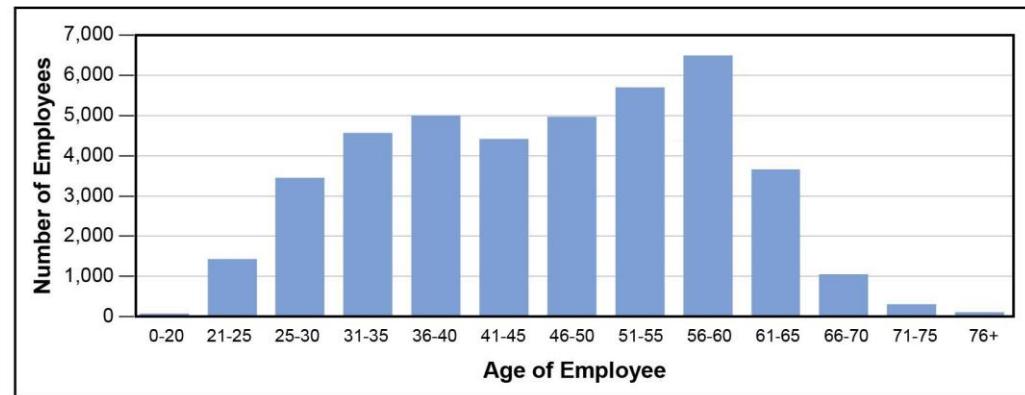
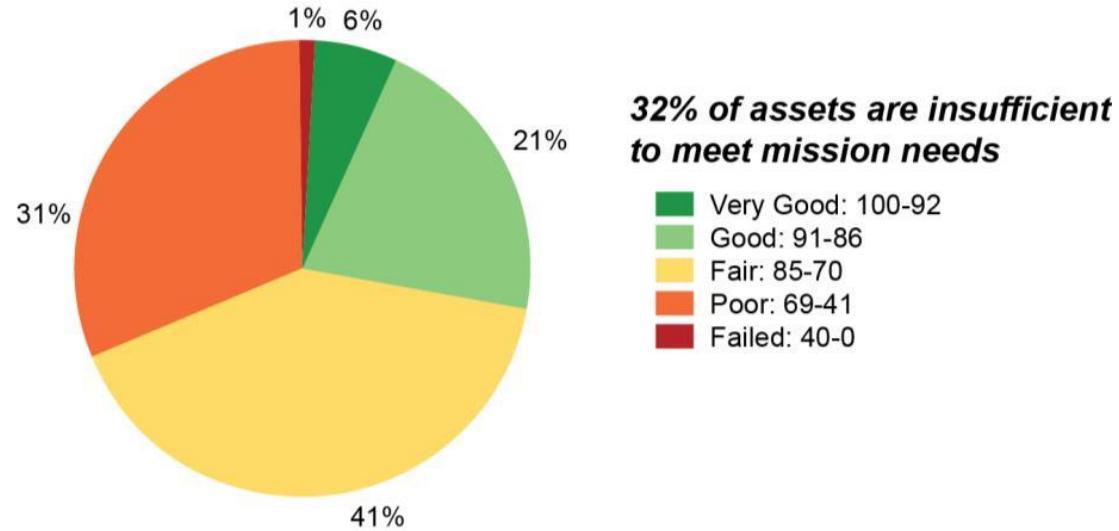
Los Alamos National Laboratory (LANL)

- Los Alamos, NM
- Multi-Program National Security Laboratory
- Design Agency for NEP
- Surveillance
- Home of LANSCE, DARHT, PF4, ...
- Production Agency for pits detonators and power sources



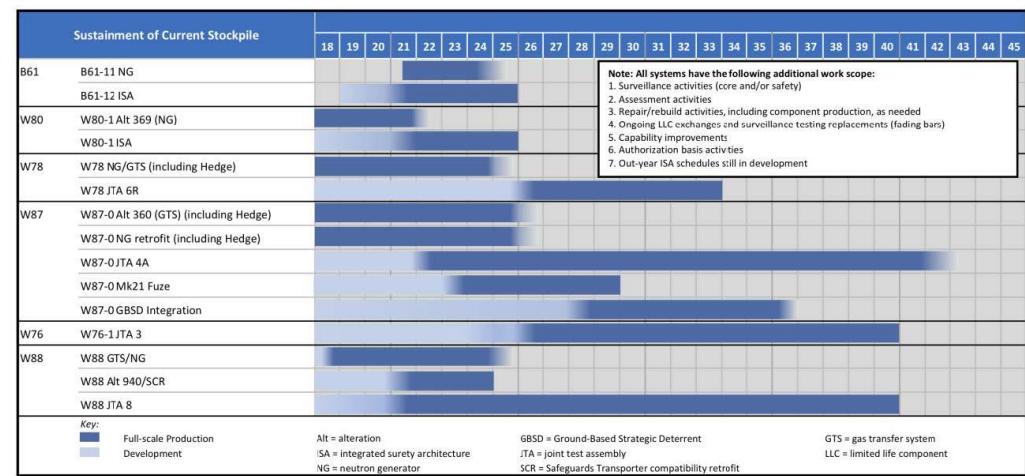
Today: Complex Challenges

- Workforce
- Aging Infrastructure
- New Facilities
- Modernization of Stockpile
- Threat Spectrum
- Changing
- Waste Management



Future: Vision

- Maintain momentum in workforce, resources
- Have a responsive, agile infrastructure to steward the stockpile
- Should the need arise, design the systems of tomorrow



Who are we Supporting?



Additional Readings

▪ History

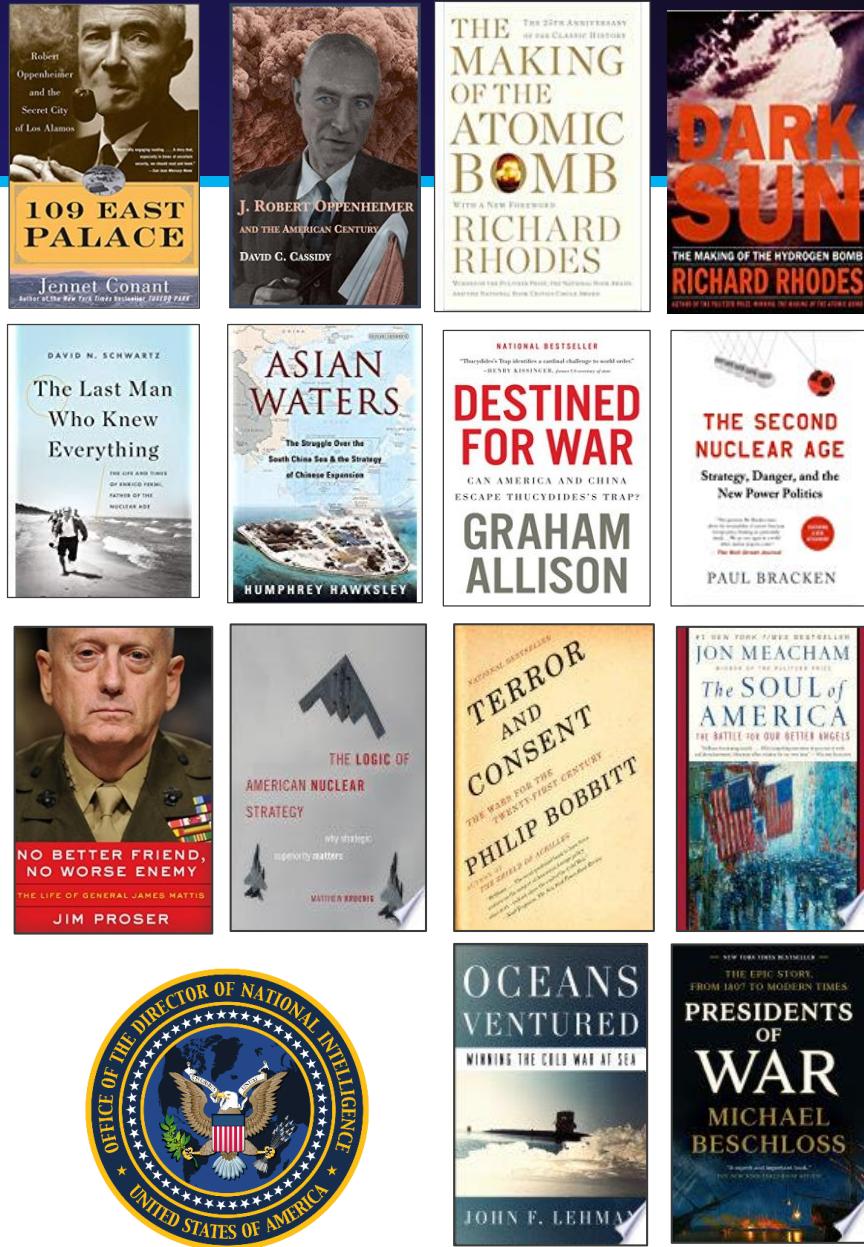
- 109 East Palace: Robert Oppenheimer and the Secret City of Los Alamos, **Jennet Conant**
- J. Robert Oppenheimer and the American Century, **David Cassidy**
- The Making of the Atomic Bomb & Dark Sun, **Richard Rhodes**
- The Last Man Who Knew Everything: The Life and Times of Enrico Fermi, Father of the Nuclear Age, **David Schwartz**
- The Soul of America, the Battle for our Better Angels, **John Meacham**
- Presidents of War, **Michael Bechloss**
- Oceans Ventured: Winning the Cold War At Sea, **John Lehman**

▪ Federal Policy Documents

- The Nuclear Posture Review
- Worldwide Threat Assessment

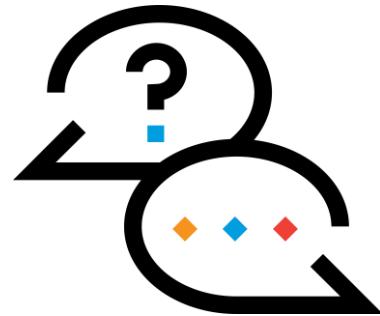
▪ Current Events

- Asian Waters: The Struggle Over the South China Sea and the Strategy of Chinese Expansion, **Humphrey Hawksley**
- Destined for War: Can America and China Escape Thucydides' Trap? **Graham Allison**
- The Second Nuclear Age: Strategy, Danger and the New Power Politics, **Paul Bracken**
- No Better Friend, No Worse Enemy: The Life of General James Mattis, **Jim Proser**
- The Logic of American Nuclear Strategy, **Matt Kroenig**
- Terror and Consent, The Wars for the 21st Century, **Philip Bobbitt**



Thank you!

Questions?



Email us: NFO@lanl.gov