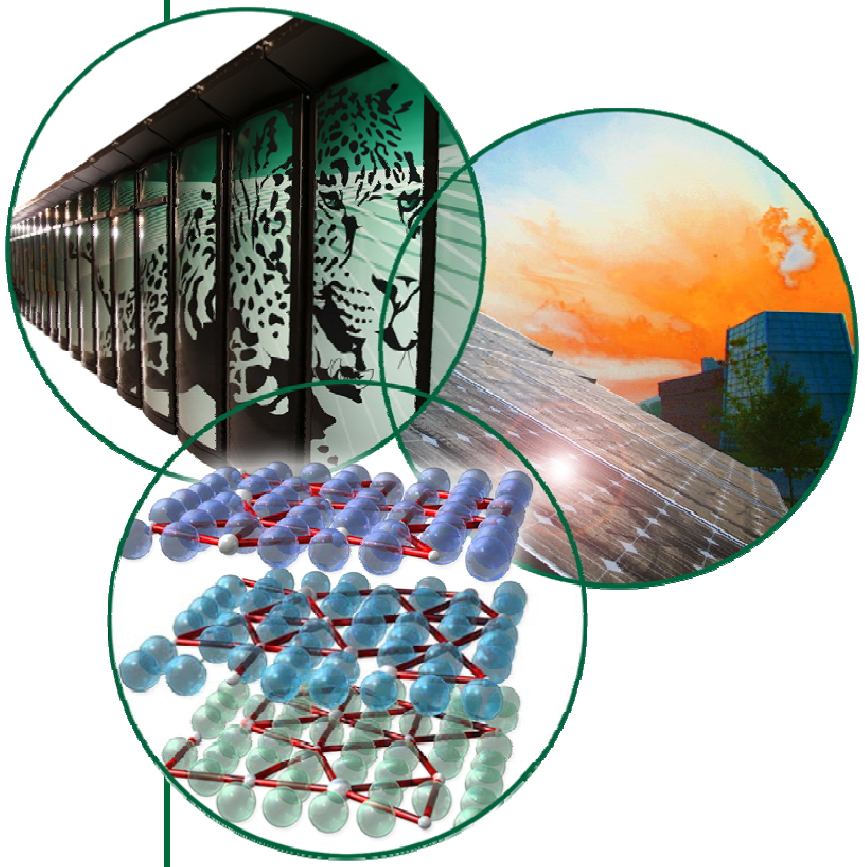
Mars and ORNL

Early learnings from an embryonic partnership



Robert F. Standaert (ORNL)

John Hammerstone (Mars)

U.S. DEPARTMENT OF ENERGY

OAK RIDGE NATIONAL LABORATORY

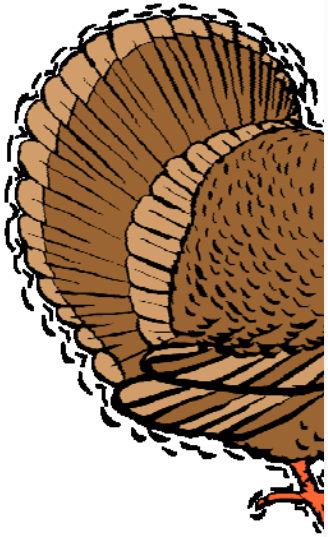
MANAGED BY UT-BATTELLE FOR THE DEPARTMENT OF ENERGY

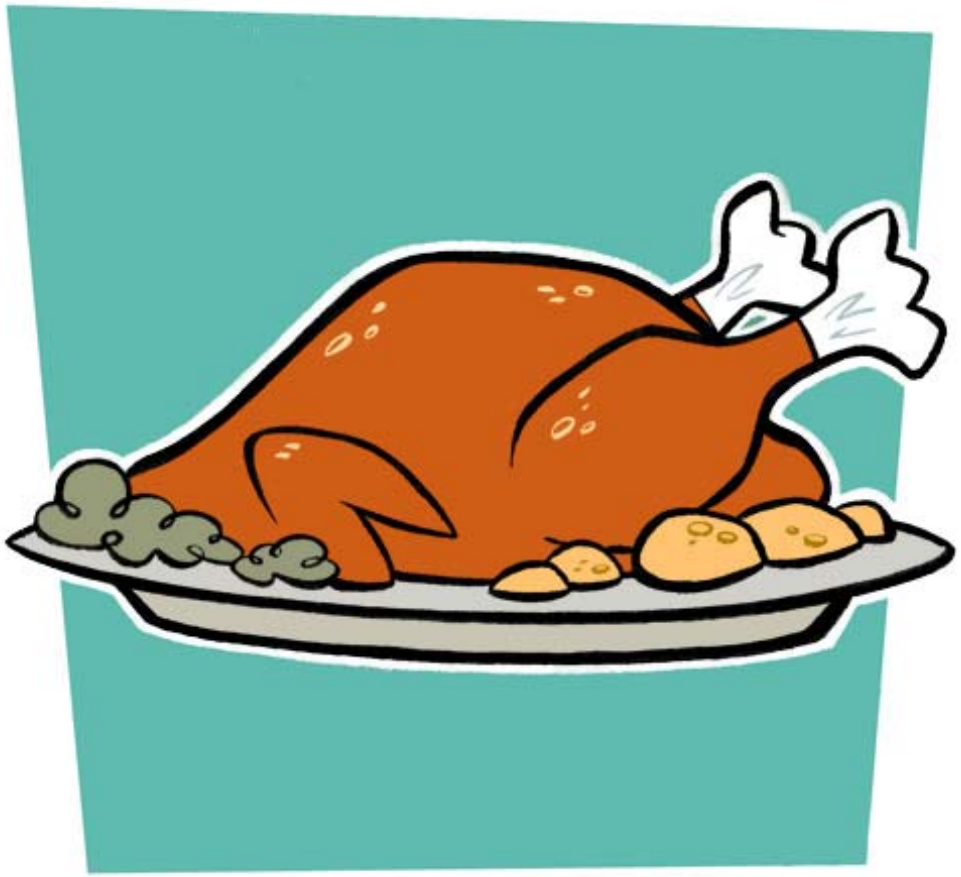
Part 1. The Black Swan: Detecting the Highly Improbable Consequential Event

John Hammerstone (Mars)

Bob Standaert (ORNL)

Consider the Turkey





MARS

The Black Swans

Salmonella

"Mineral oil"

Dioxin

Melamine

Trichloroanisole

Misformulated vitamin mix

Cyanuric Acid

MARS

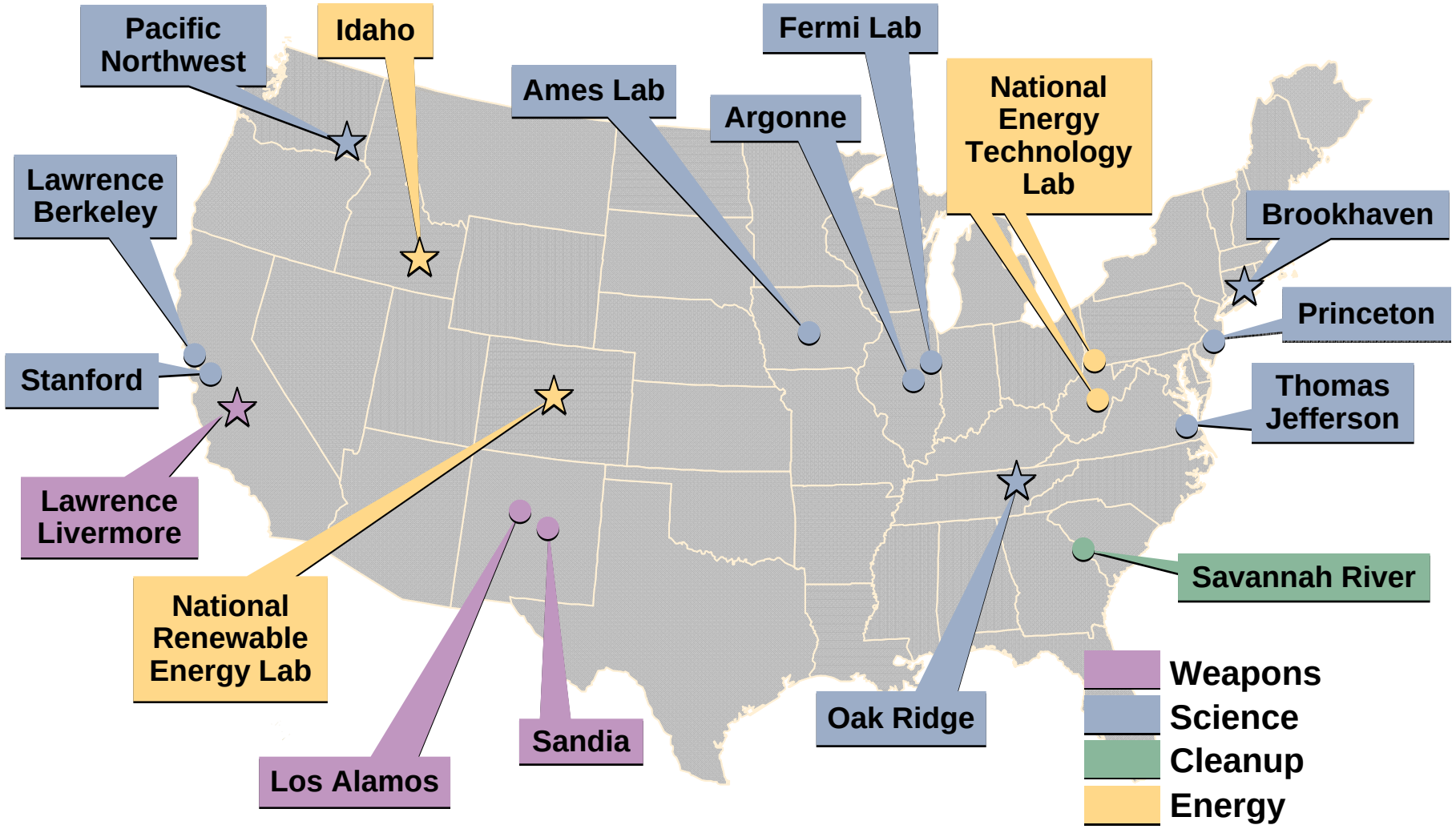
A Highly Improbable Consequential Event

- Sick Animals Asia
- Mars initially believed the issue was caused by fungal toxins
- Used a national lab to help solve the mystery (Pacific Northwest National Laboratory)
- The problem returns
- Need a preventative solution: with whom can Mars partner?

MARS

Oakridge National Laboratory

The Department of Energy's national laboratories:
A comprehensive R&D system



Oak Ridge National Laboratory

Oak Ridge National Laboratory
DOE's largest multi-purpose science laboratory

Mission:

Advance the frontiers of science and technology through broad, interdisciplinary R&D programs

Mission Drivers:

- Energy
- National Security
- Environment
- Economic Competiveness

Oak Ridge National Laboratory

- Microbiology, systems biology and plant biology
- Analytical, environmental and forensic chemistry
- Sensors, imaging and robotics
- Advanced hard and soft materials
- Nanoscience
- Transportation analysis and GIS
- Supply chain security
- National security
- Ultrascale Computing
- Neutron science

Challenge:

Can these assets be engaged for food safety and security?

An emergent partnership in food security

MARS

Leading Global Manufacturer of Snacks and Pet Food

OAK RIDGE National Laboratory

DOE's Largest Multi-disciplinary S&T Laboratory

How to combine talents?

- **Communication**
  - **Plant trips**
  - **MDRU conference**
  - **Embedded staff**
- **Pilot Experiments – Food Safety**
- **Pilot Projects – Other Areas**

Broad scope of opportunities

Food Safety

- Analytical technologies
- Supply chain analysis and optimization
- Informatics

Product and Process Innovation

- Can Lab technologies be translated into new or improved products?
- Can Lab technologies help processes confront growing security threats?

Energy Efficiency and Sustainability

- Can we reduce energy needs and environmental footprint?

OAK RIDGE National Laboratory

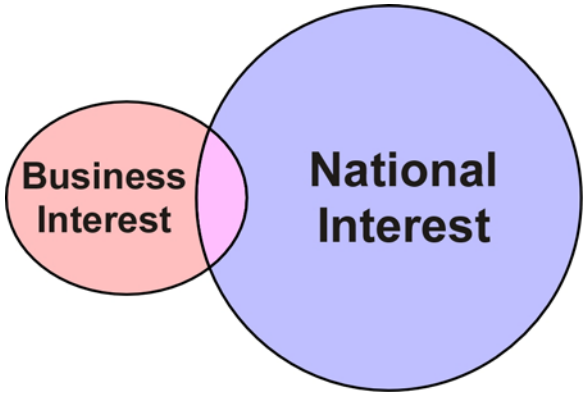
Teething Pains

- **Communication — still getting to know each other!**
  - Large, diverse organizations
  - Large numbers of people — need to connect and coordinate
  - Organizational subcultures have different styles, goals, motivations
- **Focus — unlimited challenges and opportunities, limited resources**
  - Must be selective
  - Must identify critical milestones and share expectations
- **Getting it done**
  - Need close working interaction between techies and foodies
  - Need cost-effective, productive talent mix
  - Need to exchange a lot of people, materials
  - Need to push the bureaucracies (legal, contracts)

Structural Issues

Business vs. National Interest

Research is expensive!

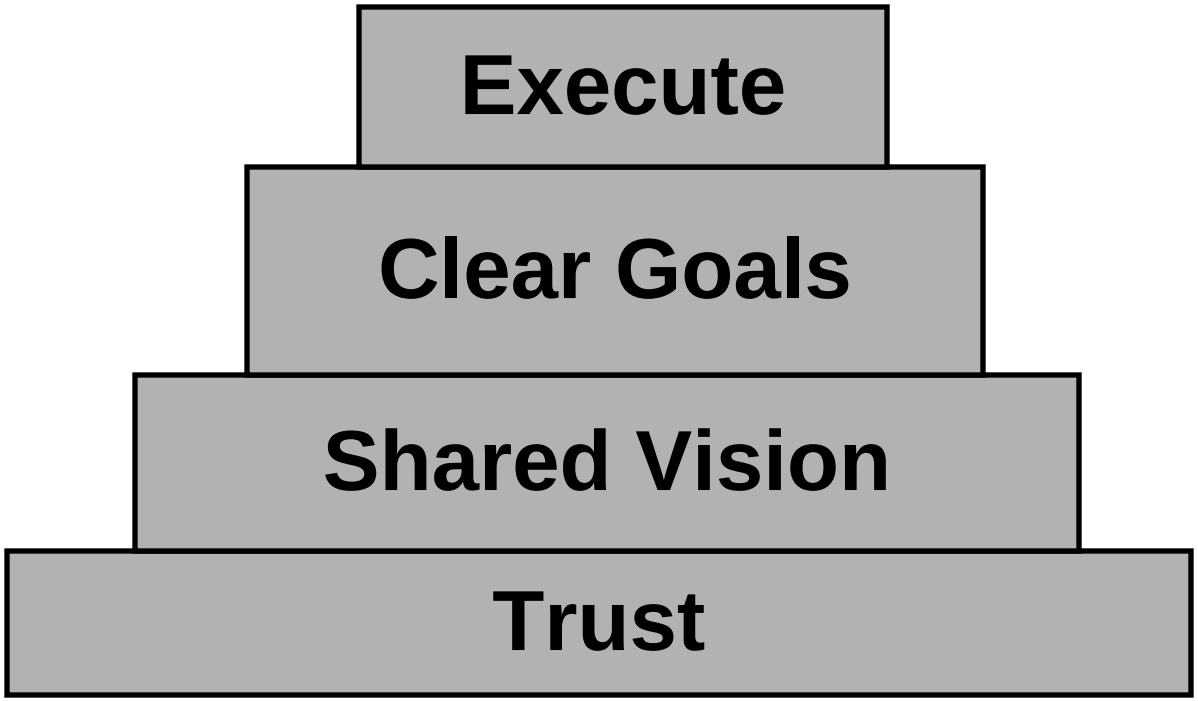


Intellectual Property and Publication

Project scope can vary from open to strictly proprietary

MARS

Early Learning From and Embryonic Partnership



MARS

Early Learning From and Embryonic Partnership

- ORNL has an exceptional talent pool
- ORNL has a large “tool-box”
- The problems are difficult so failure should be an expectation of some of the problems
- The projects must be designed with the “end in mind” (focus).
- Success is more probable when the relationship is a partnership and collaboration, ie “feet on the ground” in Oakridge.
- The projects are expensive (should funding be only private?)

MARS

Early Learning From and Embryonic Partnership

Knowledgeable contact points

- Johnnie Cannon
- Bob Standaert

Solid Projects to start the relationship

- Stand off Laser (Thomas Thundat)
- Desorption MS (Gary Van Berkel)
- CBMS (Marc Wise)

All I'm saying is now is the time to develop the technology to deflect an asteroid.

Frank Cotham
New Yorker
1998