Occupational Energy Research Program

Overview for the National Academies' "Review of the Worker and Public Health Activities Program Administered by DOE and DHHS"

November 4, 2005

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NIOSH Mission

- Conduct research to reduce work-related illnesses and injuries
- Promote safe and healthy workplaces through interventions, recommendations and capacity building
- Enhance global workplace safety and health through international collaborations.

Occupational Energy Research Program Mission

- Conduct analytic epidemiology studies of the effects of radiation and other workplace exposures on the health of current and former DOE workers
- Evaluate exposures to ionizing radiation and other physical and chemical agents
- Conduct thorough, unbiased, peer-reviewed research
- Promote protection of all workers

Occupational Energy Research Program Setting

- Occupational health study population
  - est. 600,000 current & former DOE site workers
  - Navy nuclear shipyard workers
- Time interval: 1940s to present
- Exposures of interest
  - ionizing radiation: internal, photon
  - other exposures: metals, asbestos & solvents
- Health outcomes of interest: primarily cancer

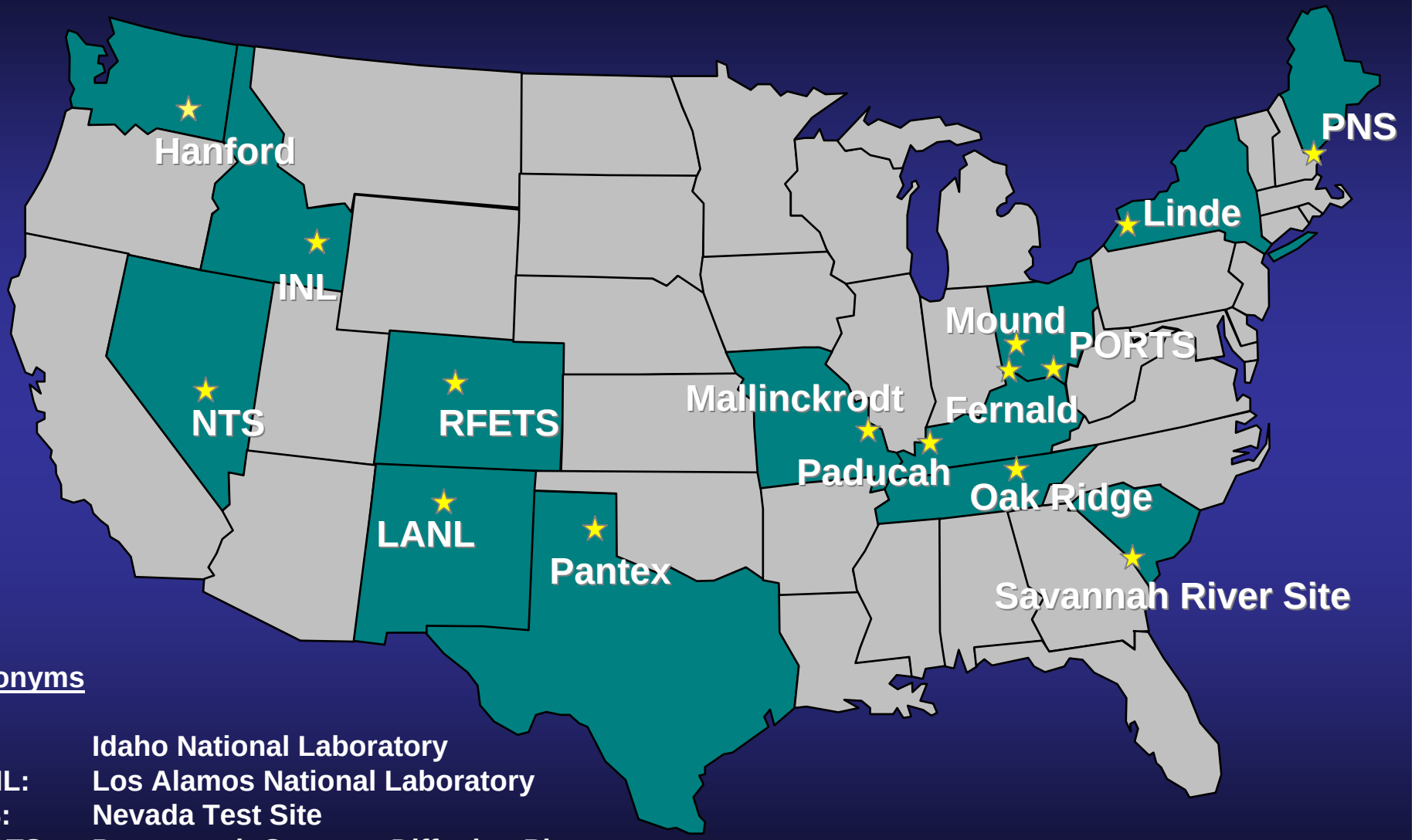
Secretarial Panel for Evaluation of Epidemiologic Research Activities (SPEERA)-1990

- Transfer analytic epidemiologic research to DHHS – via MOU
  - Peer review
  - Open and competitive grants program
- Create Advisory Committee (ACERER)
  - Set research agenda
  - Determine funding priorities
  - Guide peer review
- Create public use database (CEDR)
  - OERP provides de-identified data sets

Development of the Occupational Energy Research Program

- FY 1991: MOU between HHS and DOE
- OERP replaced three occupational epidemiology programs at DOE
  - Los Alamos, Hanford, Oak Ridge
- DOE provides funding and input on research agenda
- DHHS operates independent research & public health activity programs
  - NIOSH: Occupational exposures & effects
  - NCEH & ATSDR: Environmental exposures & effects
- Includes extramural component

Occupational Energy Research Program Sites



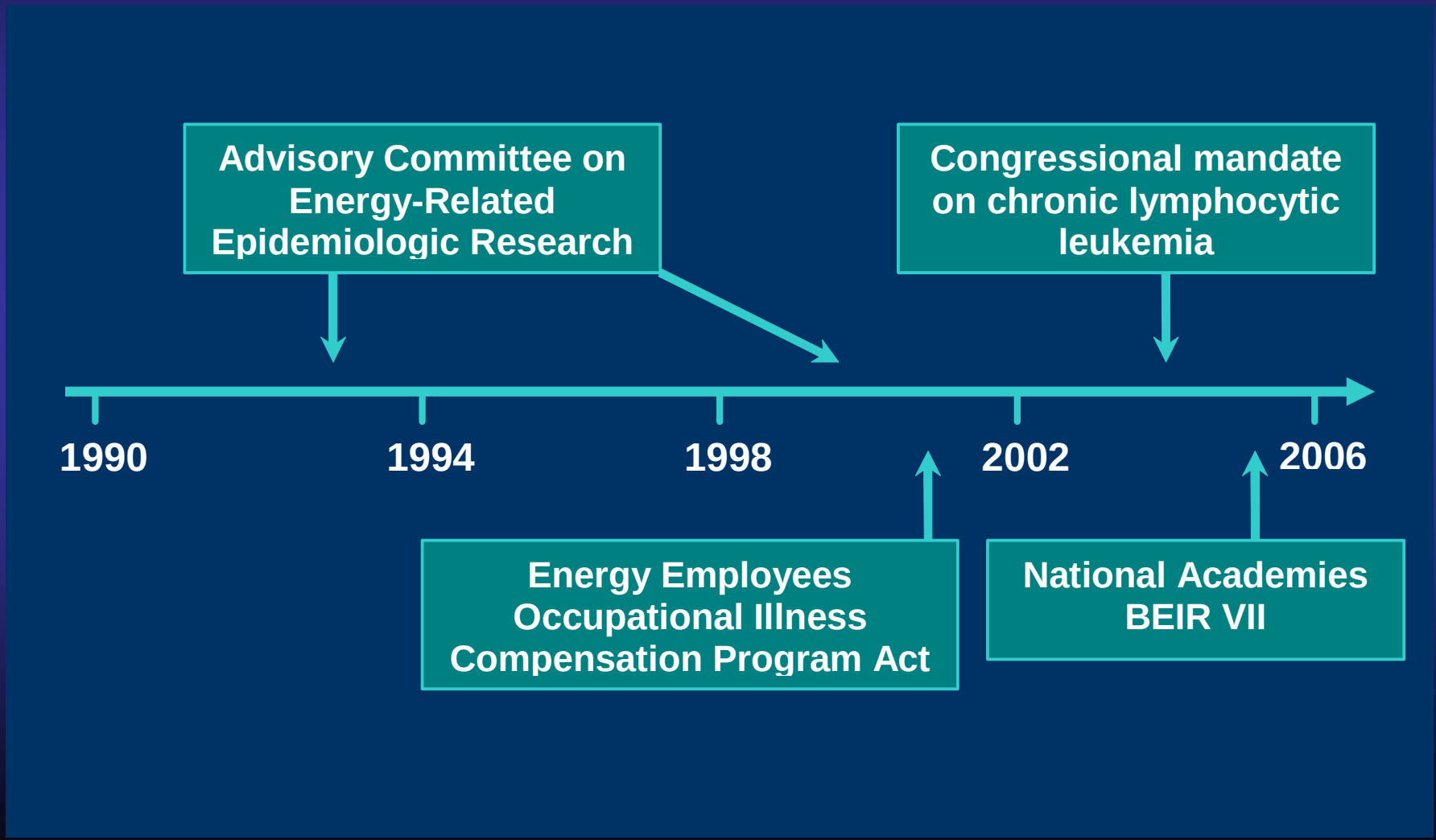
Acronyms

INL:	Idaho National Laboratory
LANL:	Los Alamos National Laboratory
NTS:	Nevada Test Site
PORTS:	Portsmouth Gaseous Diffusion Plant
PNS:	Portsmouth Naval Shipyard (Non-DOE site)
RFETS:	Rocky Flats Environmental Technology Site

Types of Research Conducted by the OERP

- Hypothesis-based analytic epidemiology
- Exposure assessment for past and current workers
- Feasibility analysis
- Health Hazard Evaluations (n=10)

OERP Research Agenda
External Influences



Primary Research Questions of the OERP

- Are current radiation exposure limits adequate?
- What are the health risks from different forms of radiation?
- How do risks from fractionated exposures compare with acute exposure risks?
- What are the joint effects of radiation and chemical exposures?

NIOSH Peer Review (1991-2005)

- All OERP research required to comply with NIOSH, HHS & OMB policies
- Key tenets:
  - Protocol reviewed by external experts at project inception
  - At least two reviewers outside of CDC
  - Higher levels of review for projects with high public interest or impact
  - All publications must first undergo external peer review

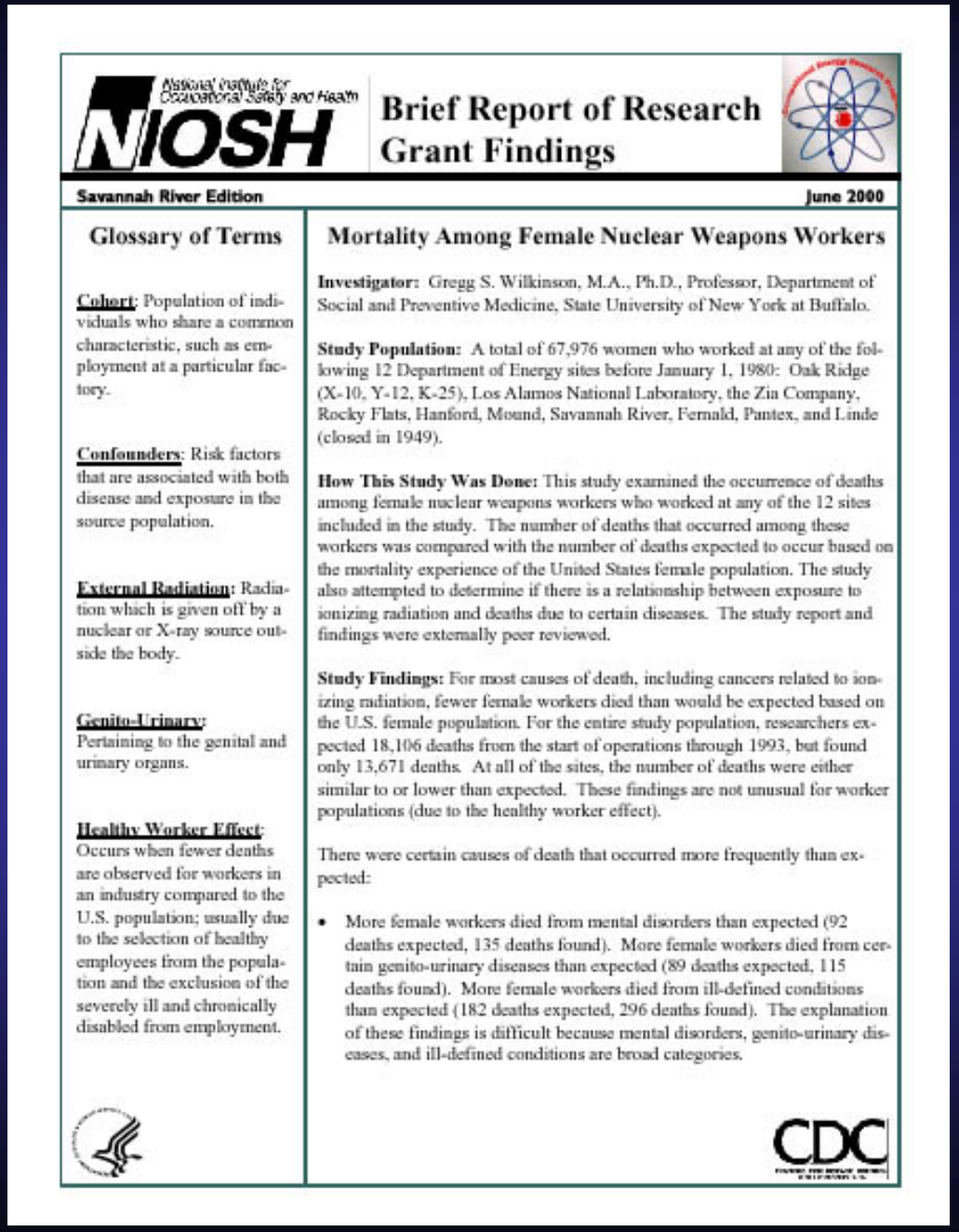
OERP Communication Goals

- Expand the involvement of partners
- Conduct research in an open environment
- Provide information to enhance understanding of health risks associated with radiation
- Solicit and consider concerns of workers and the public
- Provide relevant occupational exposure and health information for public health practice and policy

OERP Communication Tools

- Scientific community
  - Peer-reviewed literature
  - Scientific and technical reports
  - Presentations at scientific conferences and workshops
  - Comprehensive Epidemiologic Data Resource (CEDR)
- Workers and the public
  - Website
  - Communication of study findings
  - Worker outreach
  - Presentations to advisory groups
  - Public meetings

OERP Brief Report of Findings



NIOSH National Institute for Occupational Safety and Health

Brief Report of Research Grant Findings

Savannah River Edition **June 2000**

Glossary of Terms

Cohort: Population of individuals who share a common characteristic, such as employment at a particular factory.

Confounders: Risk factors that are associated with both disease and exposure in the source population.

External Radiation: Radiation which is given off by a nuclear or X-ray source outside the body.

Genito-Urinary: Pertaining to the genital and urinary organs.

Healthy Worker Effect: Occurs when fewer deaths are observed for workers in an industry compared to the U.S. population; usually due to the selection of healthy employees from the population and the exclusion of the severely ill and chronically disabled from employment.

Mortality Among Female Nuclear Weapons Workers

Investigator: Gregg S. Wilkinson, M.A., Ph.D., Professor, Department of Social and Preventive Medicine, State University of New York at Buffalo.

Study Population: A total of 67,976 women who worked at any of the following 12 Department of Energy sites before January 1, 1980: Oak Ridge (X-10, Y-12, K-25), Los Alamos National Laboratory, the Zia Company, Rocky Flats, Hanford, Mound, Savannah River, Fernald, Pantex, and Linde (closed in 1949).

How This Study Was Done: This study examined the occurrence of deaths among female nuclear weapons workers who worked at any of the 12 sites included in the study. The number of deaths that occurred among these workers was compared with the number of deaths expected to occur based on the mortality experience of the United States female population. The study also attempted to determine if there is a relationship between exposure to ionizing radiation and deaths due to certain diseases. The study report and findings were externally peer reviewed.

Study Findings: For most causes of death, including cancers related to ionizing radiation, fewer female workers died than would be expected based on the U.S. female population. For the entire study population, researchers expected 18,106 deaths from the start of operations through 1993, but found only 13,671 deaths. At all of the sites, the number of deaths were either similar to or lower than expected. These findings are not unusual for worker populations (due to the healthy worker effect).

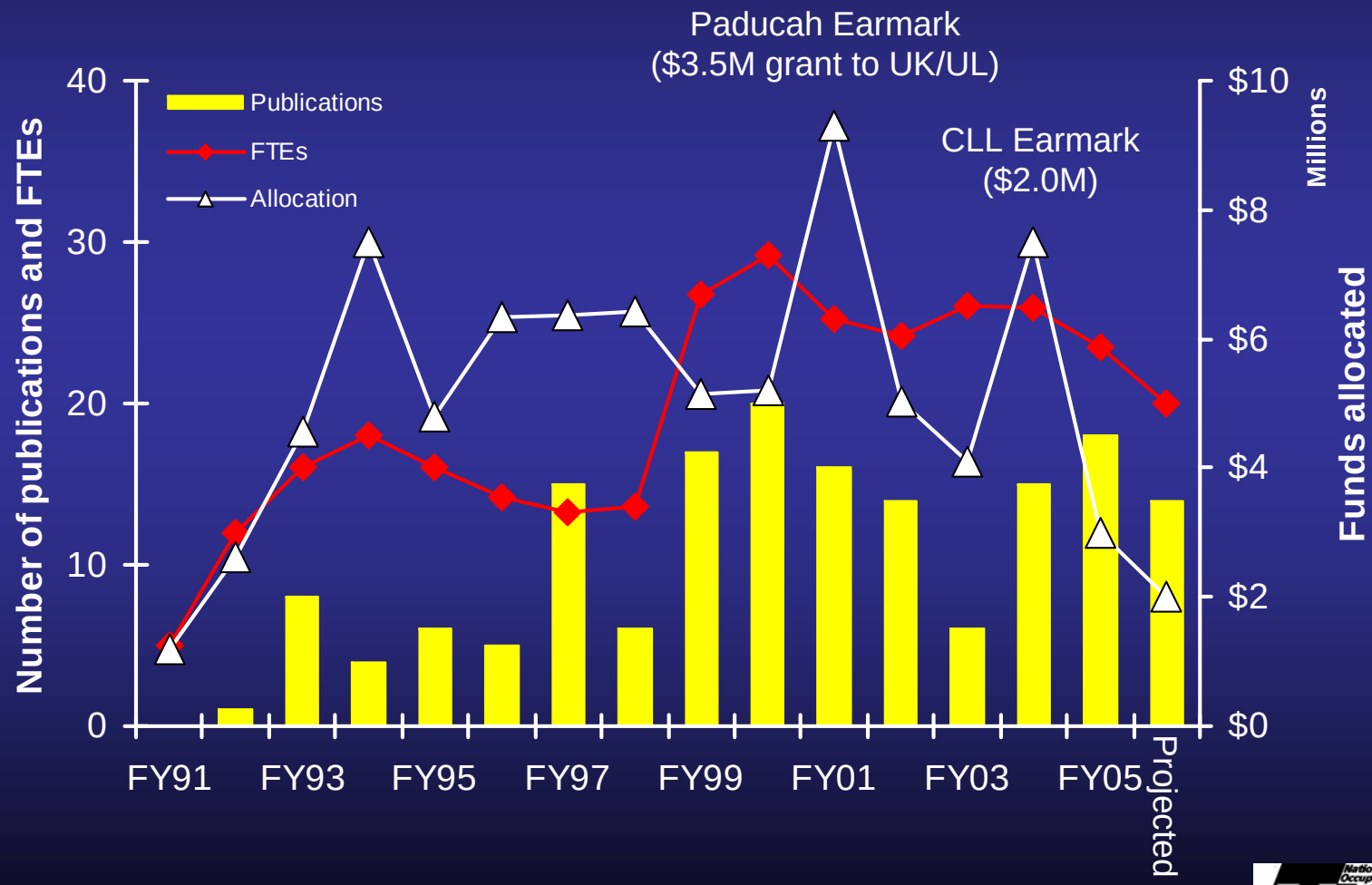
There were certain causes of death that occurred more frequently than expected:

- More female workers died from mental disorders than expected (92 deaths expected, 135 deaths found). More female workers died from certain genito-urinary diseases than expected (89 deaths expected, 115 deaths found). More female workers died from ill-defined conditions than expected (182 deaths expected, 296 deaths found). The explanation of these findings is difficult because mental disorders, genito-urinary diseases, and ill-defined conditions are broad categories.

CDC

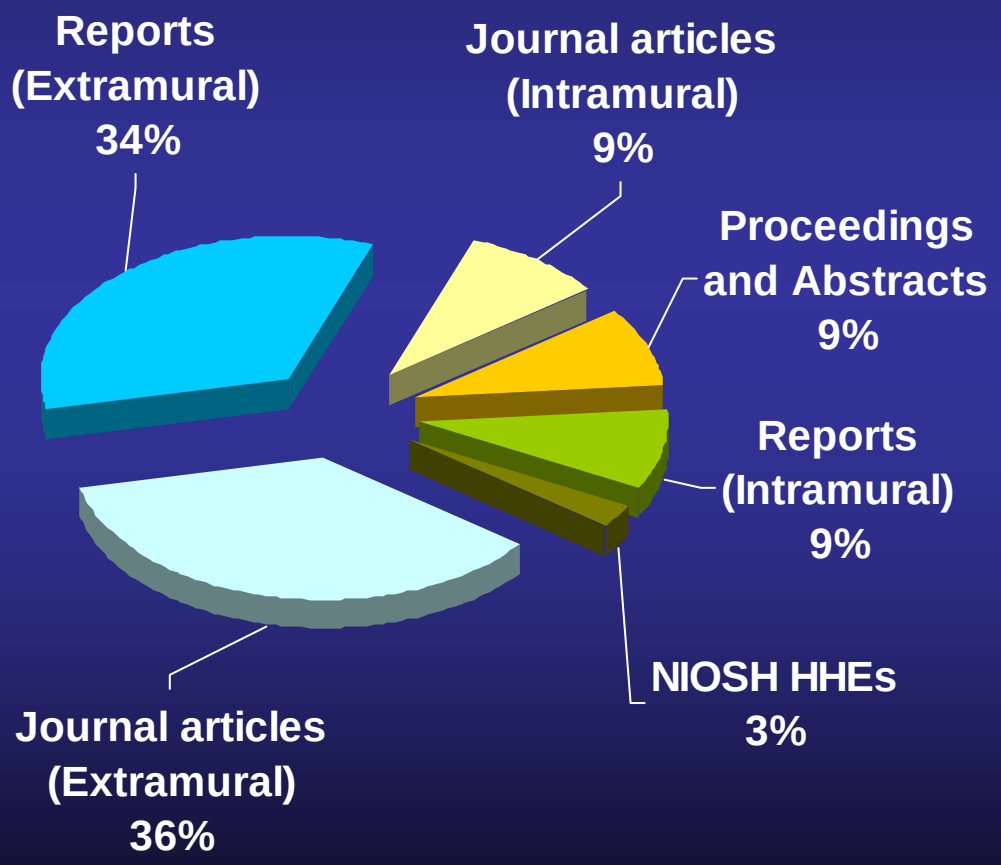
NIOSH National Institute for Occupational Safety and Health

OERP Funding, Staff & Publications



How Many Studies has the OERP Completed?

- 20 projects initiated by DOE prior to MOU
- 34 projects initiated by NIOSH
- 154 completed products (manuscripts, reports, proceedings)



ACERER Research Principles

Research Principle	Completed Study Examples
Consider Previously Unstudied Sites	Mortality Study of Workers at the Idaho National Laboratory (INL), Portsmouth GDF
Combine Cohorts for Greater Power	Female Nuclear Weapons Workers Mortality (FNW), IARC
Improve Exposure Assessment	INL, Portsmouth Naval Shipyard (PNS)
Include Non-Whites and Females	INL, PNS, FNW, Impact of Downsizing at 5 DOE sites
Develop Studies of Current Workers	Remediation Workers, Impact of Downsizing
Increase Morbidity Studies	Impact of Downsizing

Current OERP Projects

- Intramural
  - Chronic Lymphocytic Leukemia
  - Multi-site Leukemia Case-Control
  - Chemical Laboratory Workers Study
  - K25 Multiple Myeloma
  - NIOSH Epidemiologic Data System
- Extramural
  - Health Effects of Occupational Exposures in Paducah Gaseous Diffusion Plant Workers (Univ. Kentucky & Univ. Louisville)
  - Stochastic Models for Radiation Carcinogenesis: Temporal Factors and Dose-Rate Effects (Univ. Washington)
  - Susceptibility & Occupational Radiation Risks (Univ. North Carolina)

Key OERP Research Findings

Portsmouth Naval Shipyard workers exhibit gamma dose-related elevation of leukemia

At INL, most cancers not associated with radiation (poss. exc. leukemia, NHL, brain tumors, breast cancer)

Most nuclear worker cohorts relatively young (>85% still living)

International nuclear worker study shows elevation in solid cancers and (non-significantly) leukemia

Low average exposures to photon radiation (10-20 mGy)

No radiation-related cancer risk at Portsmouth GDP

Workers at Rocky Flats show plutonium-related elevation in lung cancer risk

Older workers may be at higher risk of radiation-induced cancer at ORNL and Hanford

Research Questions for Future Studies

Questions	Combined DOE	Pooled w/other	Cancer incidence
▪ Low-dose gamma effects Dose-rate differences Differential sensitivity	☑	☑	☑
▪ Neutron & internal effects	☑	☑	☑
▪ Interactions of radiation & other workplace exposures	☑		☑
▪ CLL radiogenicity	☑	☑	☑

Impact of OERP Research

- Site-specific recommendations
  - Health hazard evaluations
- Health communications
  - Understanding of workplace risks
  - Individual worker health decisions
- Advances in occupational and radiation health sciences
  - Direct evidence of low-dose effects applicable beyond workers
  - Improvements in exposure assessment methodology
  - Risks of mixed exposures
- Public health policy—regulation and compensation
  - Quantify risks from low-dose fractionated exposures
  - Risk models for “assigned share” or probability of causation

Users of OERP Research

- Department of Energy
  - Workers and management at individual facilities
  - DOE Office of Environmental Safety and Health
- Other national and international organizations
  - National Academies committees (BEIR reports)
  - Nuclear Regulatory Commission
  - Occupational Safety and Health Administration
  - World Health Organization
  - United Nations Scientific Committee on the Effects of Atomic Radiation

Users of OERP Research

- Other researchers
  - DOE's Comprehensive Epidemiologic Data Resource
  - IARC on combined international nuclear worker studies
- Program for compensating DOE workers with cancer for past exposure to radiation
  - NIOSH Office of Compensation Analysis and Support
- Workers and their representatives
  - Understanding of risks from workplace radiation
  - Information about exposures and health effects

OERP Web Site

http://www.cdc.gov/niosh/oerp/

CDC Home | CDC Search | CDC Health Topics A-Z

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NIOSH National Institute for Occupational Safety and Health

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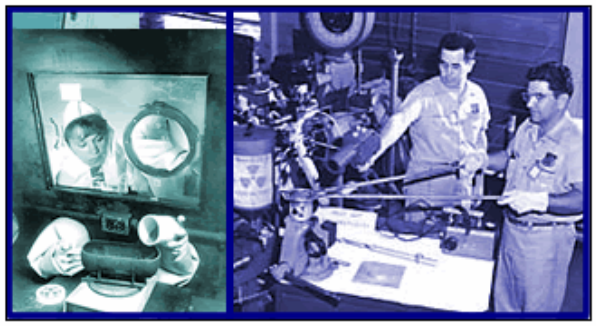
NIOSH Occupational Energy Research Program

The mission of the NIOSH Occupational Energy Research Program is to conduct relevant, unbiased research to identify and quantify health effects among workers exposed to ionizing radiation and other agents; to develop and refine exposure assessment methods; to effectively communicate study results to workers, scientists, and the public; to contribute scientific information for the prevention of occupational injury and illness; and to adhere to the highest standards of professional ethics and concern for workers' health, safety and privacy.

Purposes:

- To more fully understand radiation cancer risk factors in occupational cohorts.
- To evaluate the significance of health outcomes in the DOE and other radiation exposed workers.
- To inform workers, the scientific community, and the public of the health risks associated with exposures to radiological, chemical, and other stressors.



Programs goals include:

- Assuring that energy-related health research addresses pertinent occupational health questions and provides a framework for intervention.
- Conducting research in an open environment with meaningful communication among all interested parties.

Occupational Energy Research Program

Related Resources

News and Information

Background

Ongoing Research Activity

Completed NIOSH Initiated Research

Staff Listing

Program Study Sites

Additional points to consider today

- The “change” in the charge to this committee
- The Agenda for Public Health Activities
- We will be providing an Evidence Package
- GPRA
- Current workers & radiation
  - 224,000 workers monitored for radiation in 2003 (DOE & NRC)
- Ongoing nature of the Compensation Program

Health-Related Energy Research Branch (HERB)

Branch Chief
Doug Daniels (acting)

Assistant Branch Chief
Steve Ahrenholz

Administrative Staff
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Patty Gudlewski
Connie Sparks

Epidemiology Team
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Travis Kubale
Cindy Robinson
Sharon Silver
ASPH Fellow (vacant)

Exposure Team
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Greg Kinnes (IH)
Dennis Zaebst (IH)
Lynn Seel (IH)
Jeri Anderson (HP)
Henry Spitz (0.2, HP)
Vacant (HP)

Information Technology Team
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On-Site Contract Staff & Fellows
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Scott Henn, Westat IH
Jinghui Liu, Westat Statistician
Gordon Livingston, NRC Fellow
Chet Phelps, Constella Records Spec.
Sandy Carter, Constella IT Spec.
Yanmei Li, Constella Programmer
Jun Ju, Constella Programmer
Yuping Han, Constella Programmer

FY06 Organization Chart

More Information about the OERP

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