ANL Facility Decommissioning Training Program

Lawrence E. Boing
Argonne National Laboratory
Nuclear Engineering Division

Outline

- Introduction
- Why Argonne ?
- Format for TC
- Status of TC
- Summary

Argonne National Laboratory

Introduction - 1

- Decommissioning is the final phase in the life of many a nuclear facility – the final „closing of the circle" on these facilities

- There are a wide variety of nuclear facilities
  - Research facilities
  - Nuclear fuel cycle facilities
  - Defense industry related facilities
  - Other industrial facilities
  - Commercial and governmental facilities

Introduction - 2

- Our program focus is on the decommissioning of all types of facilities – small and large - and the common steps in the process

- Training course draws on ANL expertise in both
  - nuclear facility design, operation and decommissioning and
  - ability to form an integrated team to address the final stage of the facility life

- Sharing of technical information and lessons learned/best practices from previous decommissioning projects -

  "don"t re-invent the wheel" – and helpful resources which are available

Completed ANL D&D Projects*

- East Area Surplus Facilities (7 facilities)
- Zero Gradient Synchrotron Facility
- Plutonium Fuel Fabrication Facility (Building 350)
- Experimental Boiling Water Reactor (Building 331)
- Bldg 212 Plutonium Gloveboxes (61 gloveboxes in 9 laboratories)
- Bldg 200 M-Wing POB Hot Cells – Deactivated
- JANUS Reactor (Building 202)
- CP-5 Reactor (Building 330)
- 60-Inch Cyclotron (Building 211)
- Argonne Thermal Source Reactor (Building 316)
- Fast Neutron Generator (Building 314)
- Hot Samples Pneumatic Transfer System (Buildings 200-205)
- Waste Ion Exchange Facility (Building 594)
- Juggernaut Reactor (Building 335)
- Zero Power Reactors 6 & 9 (Building 315)
- Building 301 Hot Cell Facility
- Building 310 Engineering Building
- Facility 317 Waste Vaults and Map Tube Facility

***Plus numerous other 'Small Scale D&D' projects.**

Decommissioned Facilities

Future Decommissioning Activities

- Future Activities
  - Intense Pulsed Neutron Source (Deactivated - 2009)
  - Alpha Gamma Hot Cell Facility – Bldg 212
  - G-Wing & K-Wing Areas – Bldg 205
  - M-Wing (Multiple kCi and MCi Hot Cells) – Bldg 200

Why Argonne - 1

- Over the last 35+ years, the ANL Decommissioning Program has supported and/or successfully decommissioned about 25 numerous types of facilities:
  - Research reactors / prototype reactors
  - Hot cell facilities
  - Accelerator facilities
  - Glovebox and critical assembly facilities
  - Fuel fabrication facilities
  - Waste management facilities
  - Small / scattered site laboratory facilities

Why Argonne - 2

- Served as the host site for the first DOE / EM-50 D&D Focus Area Large Scale Demonstration Project at the CP-5 Research Reactor facility

- Lending technical support / expertise to other decommissioning projects and programs – nationally and internationally

- Served as an independent and experienced „information broker" with our extensive D&D experiences and knowledge of the industry

Decommissioning Expertise Components

- Decommissioning Projects - 1977 – current (36 years)
- Decommissioning Training - 1997 – current (16 years)
  - Includes Training Fellowship Program and Decommissioning Certificate Program
- Decontamination & Decommissioning Science Consortium - with Oak Ridge Associated Universities; 2002 – current
  - All of the components are a part of Argonne's nuclear heritage in both domestic and international nuclear programs / activities

Training Course Photos

Training Course Audience

- National and international community
- Specifically
  - Nuclear regulators
  - DOE staff and DoD staff and other operators
  - DOE operating / integrating contractors
  - D&D service providers & technology developers
  - Nuclear facility operations staff from all types of nuclear facility operations – technical and management staff
  - Stakeholder and oversight groups
  - Young staff members (recent)

Training Course Format - 1

- Consists of 2 basic elements:
  - Basic steps in the D&D process
  - Case studies on completed D&D projects

Training Course Format - 2

- TC Module elements include:
  - Safe shutdown or deactivation
  - Environment safety & health
  - Waste management
  - Regulatory drivers
  - Information resources
  - U S D&D experiences
  - Project planning & management/organization
  - Site characterization

Training Course Format - 3

- Technologies
- Cost estimates/financing
- Evolving D&D technologies
- Project close-out & final surveys
- International experience
- Lessons learned
  - Also included - tours of facilities in decommissioning or related to the topic (waste management and technologies) and vendor exhibits/displays

Program Status

- Several formats for training courses
  - 3-4 day course (general and site specific) – registrants pay fee or sponsor supports
  - 1-3 week intensive courses (IAEA) – sponsor supports

- Average 5 to 6 sessions per year

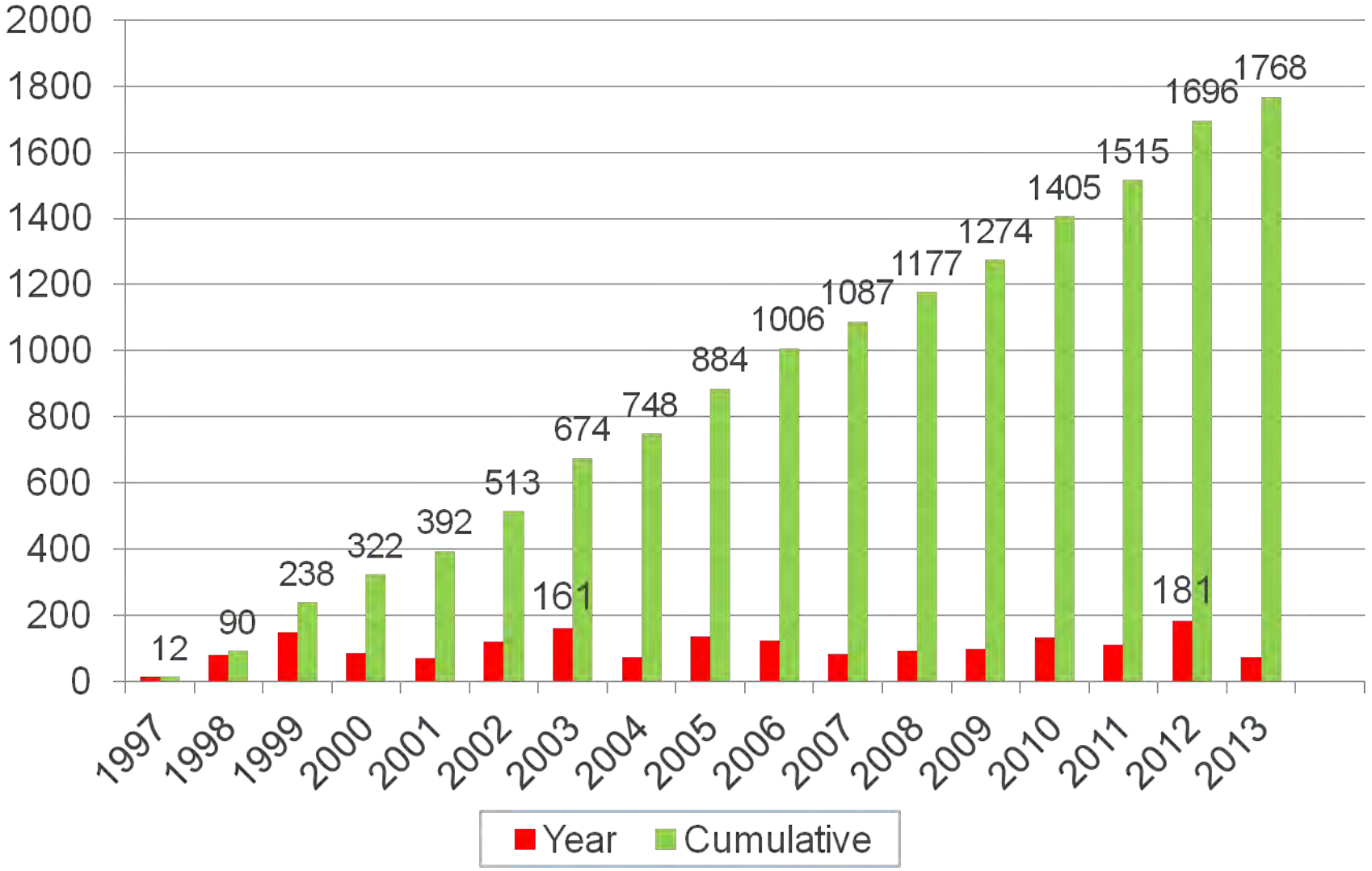
- Total of over 70 offerings and nearly 1800 attendees („graduates“) from over 55 countries since program began in September 1997

Where We Have Been

- Pleasanton, CA
- San Diego, CA
- Washington, DC area*
- Miami, FL
- Augusta, GA
- Chicago, IL*
- Idaho Falls, ID
- Las Vegas, NV*
- Princeton, NJ
- Albuquerque, NM
- Albany, NY
- West Valley, NY area
- Cincinnati, OH*
- Cleveland, OH
- Sandusky, OH
- Pittsburgh, PA area
- Oak Ridge, TN
- Salt Lake City, UT
- Charlottesville, VA
- Virginia Beach, VA*
- Plus -
  - Canada*
  - Romania

* = multiple sessions

Training Course Attendance



Foreign TC Participants – Non-IAEA

- Canada
- Romania
- South Korea
- UK
- Russian Federation
- Argentina
- China
- Taiwan
- Finland
- Sweden
- Spain
- Japan
- Slovakia
- Australia
- Denmark
- Lithuania
- South Africa
- Belgium
- Israel
- Italy
- Netherlands
- Germany

Training Course Attendee Trends - 1997 to 2013

- Increasing foreign entities participation
- Increasing specialty private firms participation

- Decreasing DOE contractor participation

- Steady level of participation by many Federal entities

Decommissioning Certificate Program (DCP)

- Certificate issuing program developed by combined efforts of Argonne National Laboratory and Oak Ridge Associated Universities
  - Facility Decommissioning TC – ANL
  - MARSSIM TC – ORAU
  - Plus any one of three other eligible decommissioning related training courses: RESRAD TC (ANL), Site Characterization TC (ORAU), or Gamma Spectroscopy TC (ORAU)
  - 21 certificates awarded to date

- Intended to leverage skills and expertise of staff members with DCP credentials
  - www.dd.anl.gov/ddtraining/DecommissioningCertificateProgram.pdf

Decommissioning Fellowships

- Fellows receive anywhere from 1 week to 4 weeks of specialized training in decommissioning

- Includes individual training with technical specialists, visits to decommissioning project sites, equipment demonstrations and commercial facilities which support various nuclear activities
  - South Korea
  - Latvia
  - Iraq - MoST
  - China - CIAE

Summary

- Wide scope of involvement and expertise addressing needs of both the national & international decommissioning community
- Recognized as technical experts in the nuclear decommissioning area
- Helping others address and solve decommissioning problems through training of future specialists

Websites

- ANL D&D Program & Decommissioning Training
  - www.dd.anl.gov
- ANL RESRAD Training Course
  - https://resrad.evs.anl.gov/training/
- ORAU Professional Training Programs
  - https://www.orau.org/health-physics/training/index.html

Contact information

- Lawrence E. (Larry) Boing
- Phone: 630.252.6729
- Fax: 630.252.7577
- E-mail: lboing@anl.gov

- Website: www.dd.anl.gov
- LinkedIn: Join "Nuclear Decommissioning Subgroup of Nuclear Safety"