Am-241 Safety Incident

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Chief Safety Officer

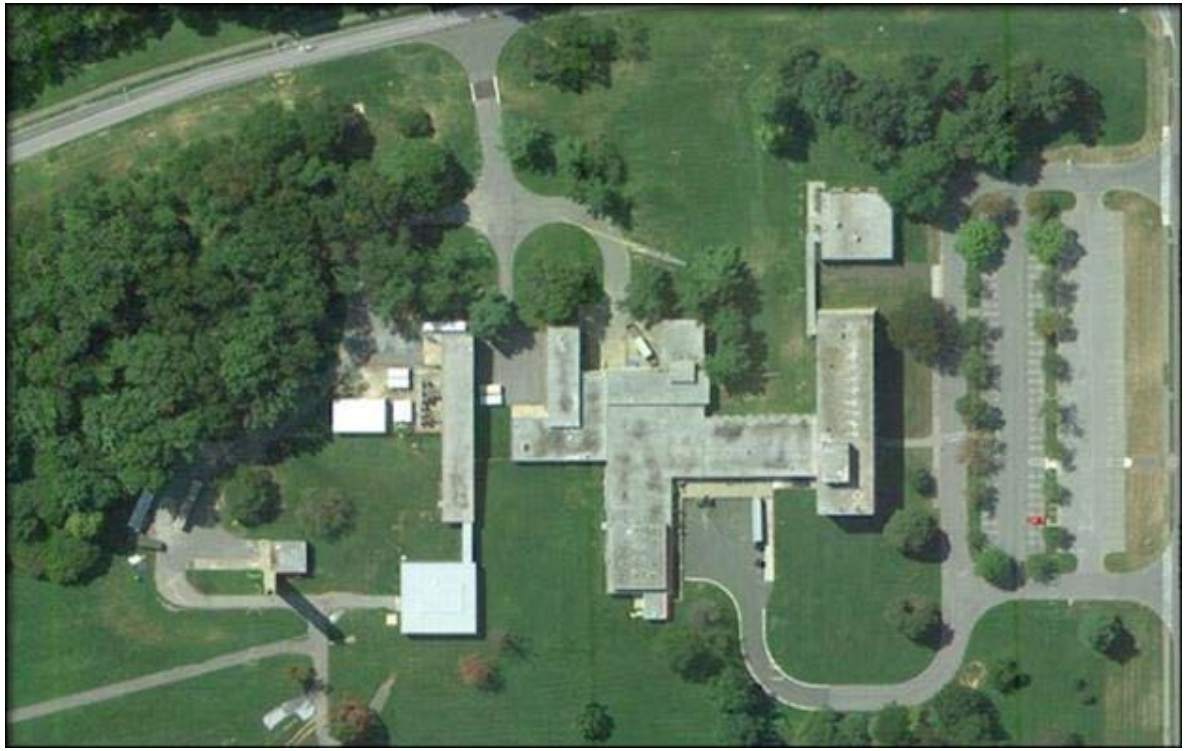
NIST Visiting Committee on Advanced Technology
October 23, 2017

Agenda

- NIST's Role in Radiation Physics
- Unplanned Contamination Event
- Unplanned Contamination in Unrestricted Areas
- Bioassay Results and Current Dose Estimates
- Incident Investigation
- Next Steps

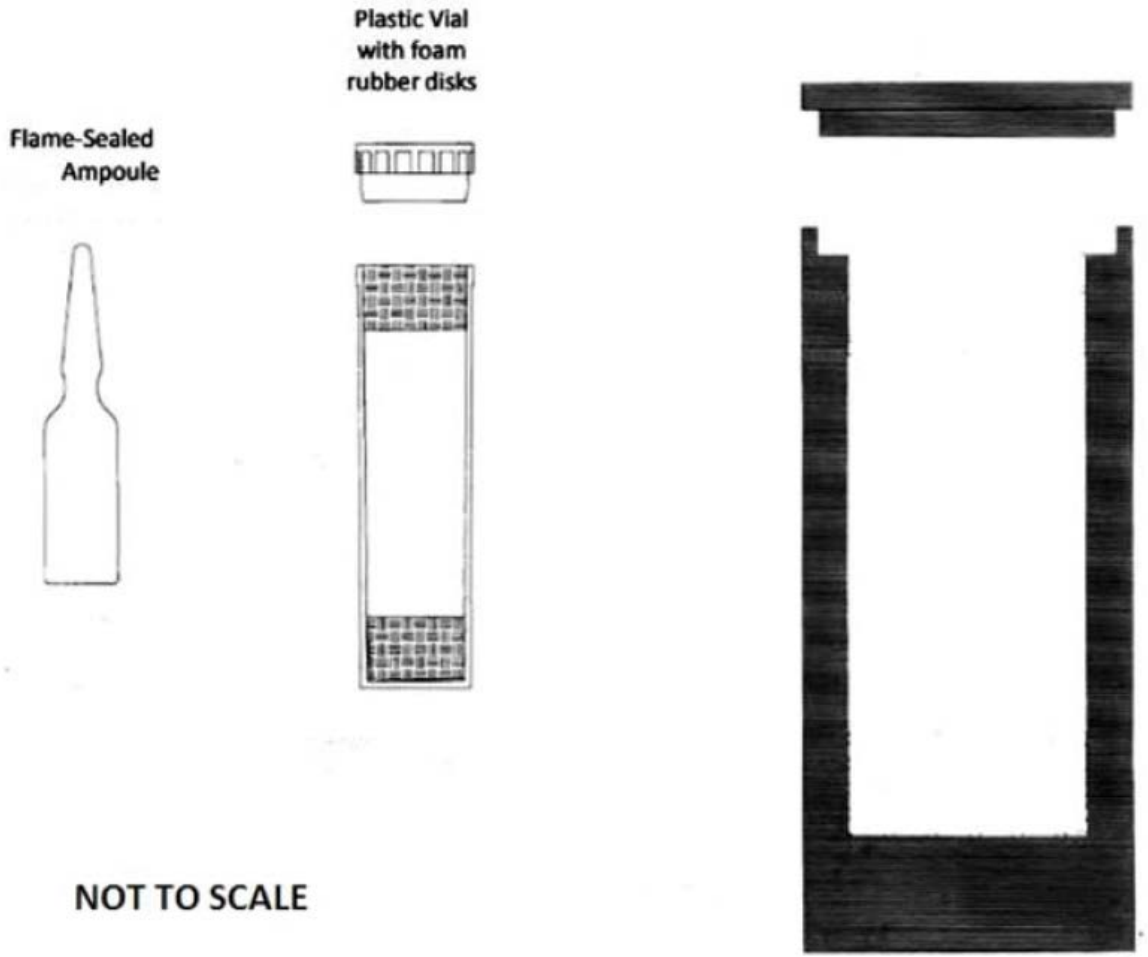
NIST's Role in Radiation Physics

Jim Olthoff, Director
Physical Measurement Laboratory



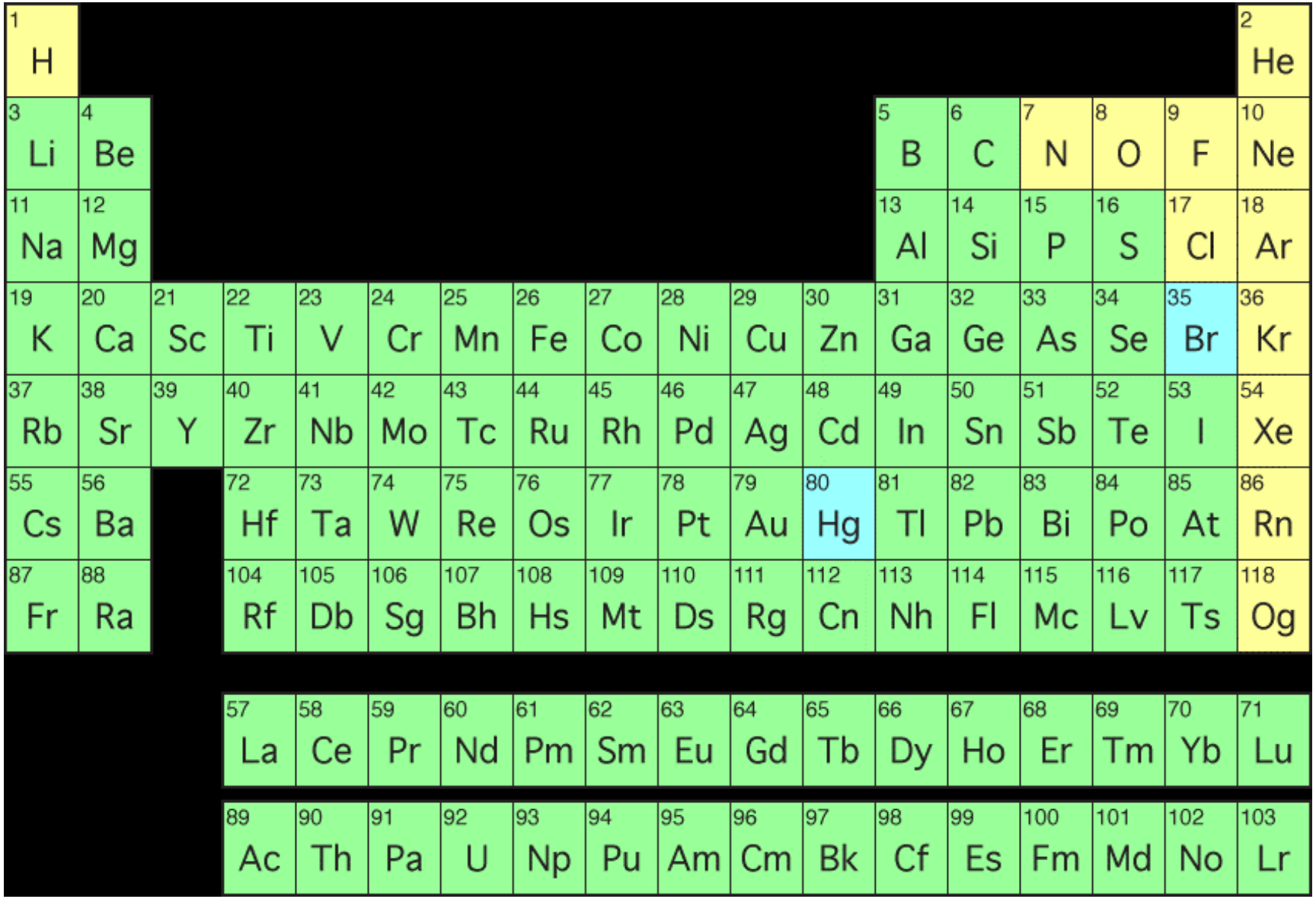
Building 245
Radiation Physics

Unplanned Contamination Event


Plastic Vial
with foam
rubber disks
Flame-Sealed
Ampoule
NOT TO SCALE


CAUTION
CAUTION
CONTAMINATED AREA


CAUTION
CAUTION
RADIOACTIVE
MATERIAL
CAUTION
RADIOACTIVE
MATERIAL



Initial Incident Response

- Issued stop work order
- Determined extent of condition of inherently unsafe ampoules
- Put inherently unsafe ampoules in a safe configuration
- Identified potentially exposed individuals – “flying blind”
- Surveyed and decontaminated spaces
- Engaged experts at the Radiation Emergency Assistance Center and Training Site (REAC/TS)
- Initiated bioassays: lung scans, urinalysis

Initial Urinalysis Results

- Received results for three individuals at highest risk (09/05)
  - One detect – Individual #1
  - Two non-detect
- Dose assuming inhalation pathway above regulatory limits – updated NRC event report (09/06)
- Dose assuming ingestion pathway > 5 times regulatory limits – updated NRC event report (09/08); 30-day report required
- REACT/TS advised medical treatment

Unplanned Contamination in Unrestricted Areas

Discovery of Contamination in Unrestricted Areas

- Found low levels of Am-241 in two offices
- Asked the DOE Radiological Assistance Program (RAP) to assist in controlling the potential spread of contamination (09/10)
- Restricted access to Building 245 (09/11)
- Established Incident Response Team (IRT) to support, coordinate, inform (09/11)
- RAP team finds no Am-241 contamination (09/16)

Return to Work in Building 245

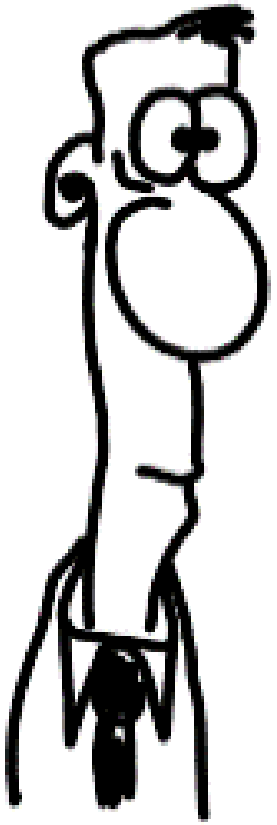
- Reopened office spaces (09/18)
- Established four-step process to reopen laboratory spaces
  - Identify sources in laboratory space
  - Perform evaluation of safety
  - Perform evaluation of need to keep
  - Determine need of mission critical work
- Requires approval by the Radiation Safety Officer and line management up to and including NIST Director

Bioassays and Current Dose Estimates

- Urinalysis for 34 individuals
  - Individual #1 – above minimum detectable activity (MDA)
  - Individual #2 – slightly above MDA
    - Results of two retests below MDA; awaiting results of third retest
  - 32 individuals below MDA
- Dose estimates for Individual #1
  - Inhalation v. ingestion v. wound pathway
  - Subject matter experts on internal dosimetry and dose reconstruction
  - **Estimated dose for the wound pathway below all occupational dose limits**

Incident Investigation

Rob Dimeo, Director
NIST Center for Neutron Research



Next Steps

- Finish re-opening labs in Building 245
- Decontaminate Room C11
- Complete incident investigation
- Take corrective actions identified in two NRC 30-day reports
- Await NRC's final inspection report
- Develop an incident response playbook

Discussion