

The 2019 Sealed Source Recovery Incident at the University of Washington and NNSA Lessons Learned



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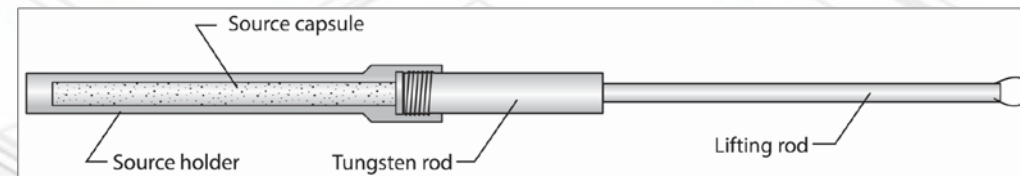
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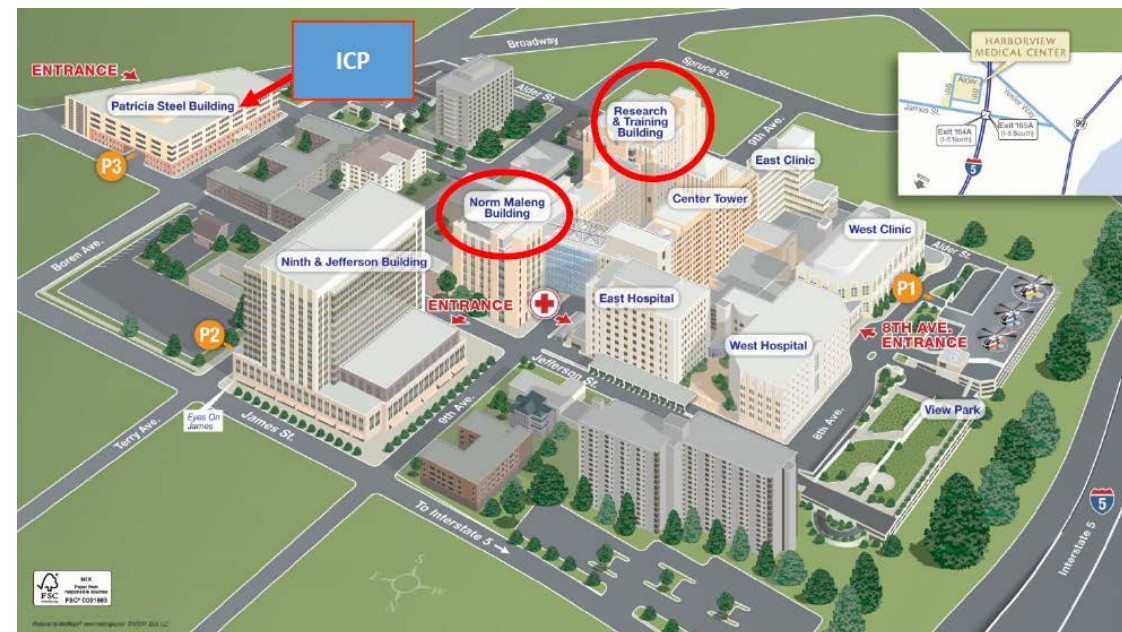
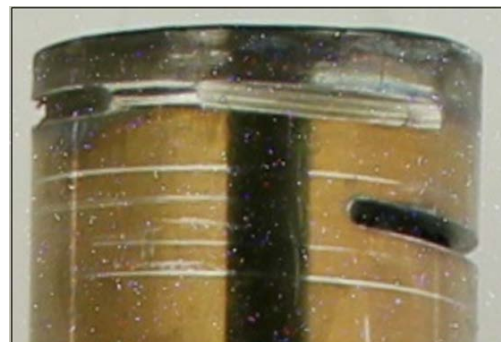
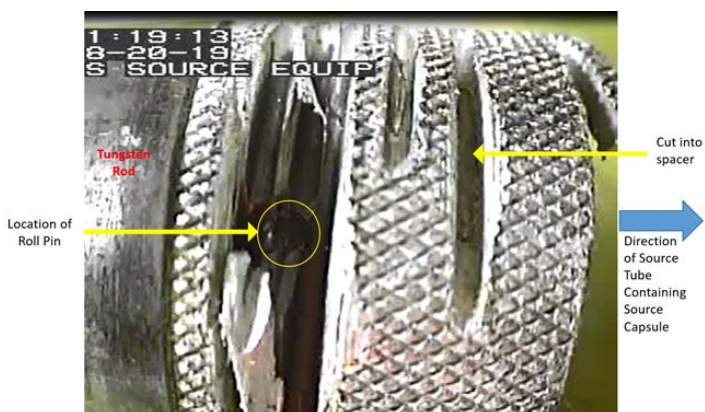
NNSASM
National Nuclear Security Administration

Cs-137 Sealed Source Breach



Event Consequences

- Near Miss to Free Release Event
- 13 People Contaminated
 - 11 Internally
- 1 Public Facility Operationally Impacted (Research & Training Building)



Event Response



May 2nd - 3rd
Immediate Response
Seattle Fire Department

University of
Washington

Washington Department
of Health

May 3rd - 5th
Post Event Response

Radiological
Assistance Program

University of
Washington

INIS/CHASE

May 6th - 14th
Post Event Response

University
of
Washington

INIS/CHASE

May 15th

Unified Command
Recovery Operations



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Operational Phases

Phase 1 – Event Response (complete)

Phase 2 – Source Recovery (complete)

Phase 3 – Remediation (ongoing)

Phase 4 – Reconstruction (ongoing)



Ongoing Operations (Phases 3 and 4)

- Remediation is progressing with University of Washington-NNSA concurrence on the approach for all impacted areas.
- Remediation will continue into fall 2020; reconstruction into late 2020.
- Goal: Reoccupation early 2021



Impact to Building Occupants

- Work impacted at the Research and Training Building:
 - More than 200 researchers and laboratory staff were forced to relocate into other spaces
 - Over 80 funded research programs were impacted (estimated to tens of millions of dollars)
- Space that was impacted
 - Vivarium with more than 300 research animals at the time of release
 - Primary training and auditorium space for Harborview Medical Center and School of Medicine
- Long-term School of Medicine impacts
 - Incoming researchers and classes
 - Research grants impacted by completion of previous scope

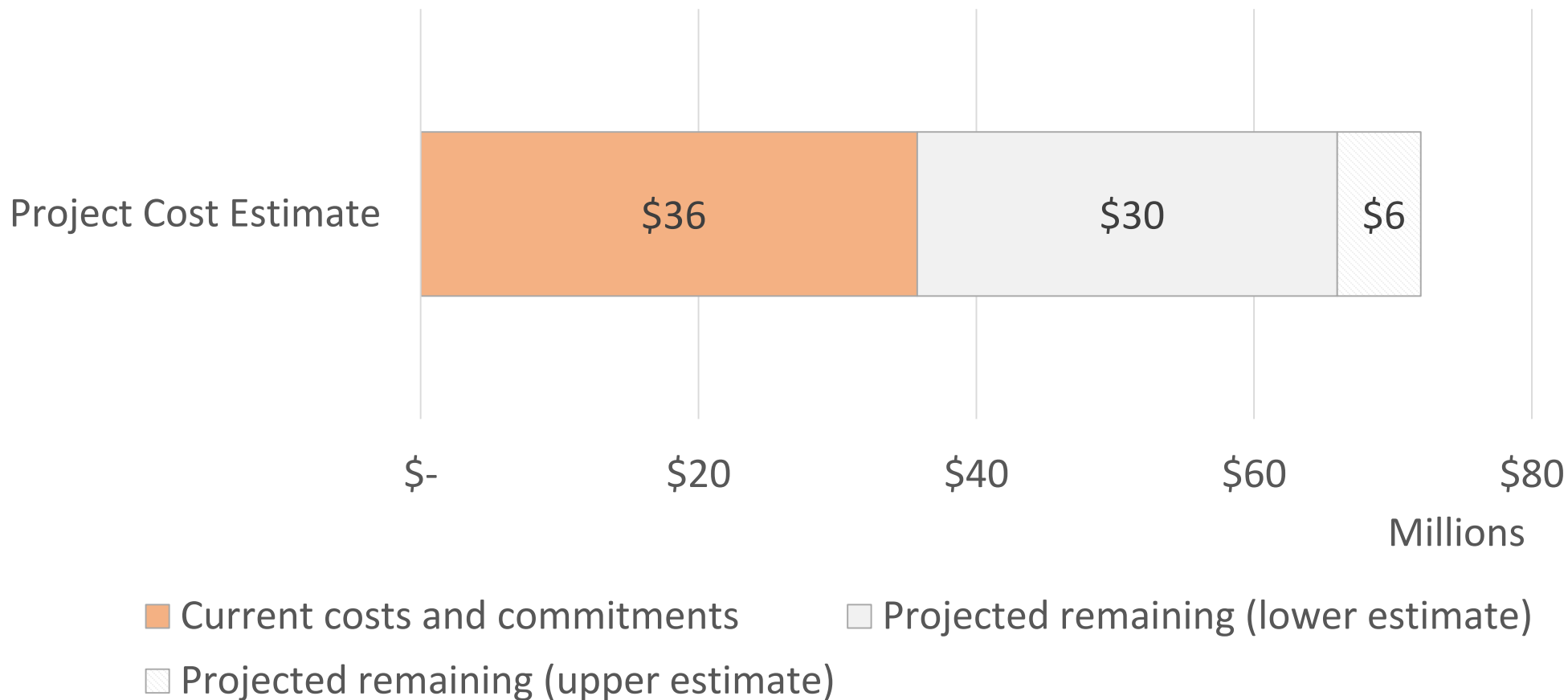


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Event Response, Recovery, Remediation, and Reconstruction Costs



- NNSA
 - Clarify Regulatory Framework with the Nuclear Regulatory Commission
 - Evaluate Oversight for Off-Site Subcontracted Work
 - Consider Advisory Capability to Assist Other Organizations
- Triad National Security
 - Implement Integrated Safety Management for Off-site Contracted Work
- International Isotopes
 - Implement Integrated Safety Management before Award of New Contracts



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Report available:

<https://www.energy.gov/ehss/downloads/sealed-source-recovery-university-washington-harborview-training-and-research>

Source Recovery Improvements

- NNSA has re-evaluated the risk associated with all radioactive source recoveries and is changing how it recovers sources
- Off-site and on-site requirements for source recovery will be more similar
 - Regardless of complexity, a Job Hazard Analysis is now required for any source recovery work
 - Integrated Safety Management will be implemented before awarding any new contracts to recover sources
- NNSA met with the Nuclear Regulatory Commission to clarify the regulatory framework as both agencies have responsibilities in this area



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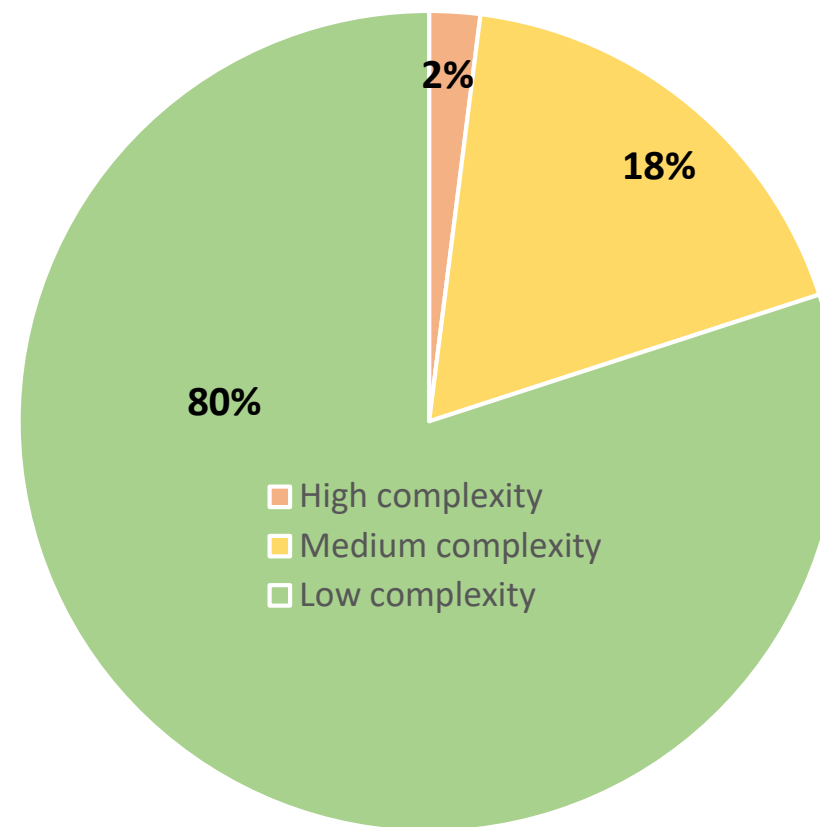


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Source Recovery Improvements (cont.)

- All high risk; not all high complexity
 - High: Cutting/modifications to source assembly to fit in container – *paused since Seattle incident*
 - Medium: Source transferred into transfer shield and Type B container – *paused since Seattle incident*
 - Low: No source transfer, irradiator fits in Type B container – *ongoing*
 - 54 recoveries completed since May 2

How complex were the ~300 Cs-137 irradiator recoveries?



Source Recovery Improvements (cont.)

- NNSA will evaluate recovery options; shift recoveries from high/medium to low complexity
- Develop resources to recover devices that currently cannot be moved to medium or low complexity
 - 380B or transfer shield modifications



medium
complexity
recovery



low
complexity
recovery

Impacts on the Cesium Irradiator Replacement Project (CIRP)

- No impact on rate of volunteers and replacement contracts signed
- Medium and high complexity recoveries tend to be research irradiators
- Revised removal policies and procedures being implemented, though uncertainties remain.
 - No recoveries have taken place since early March due to COVID-19. Restart timeline TBD.
- Device users are understanding of the delays, though some have concerns.

Delayed CIRP Recoveries	
High Complexity	15
Medium Complexity	24
Low Complexity	0
Total	39

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