

2026 USTUR Scientific Advisory Committee Meeting
Hampton Inn, Richland, Washington; April 16–17, 2026

The United States Transuranium and Uranium Registries Health Physics Database

Learning from Plutonium and
Uranium Workers

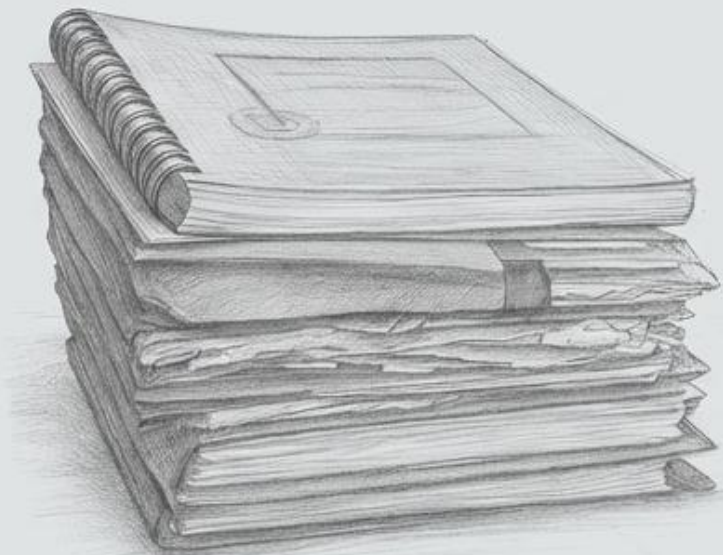
Scientific Advisory Committee Update: 2026



Maia Avtandilashvili, *Associated Research Professor*
ustur.wsu.edu | m.avtandilashvili@wsu.edu

Transforming historical paper legacies into a standardized, searchable research engine.

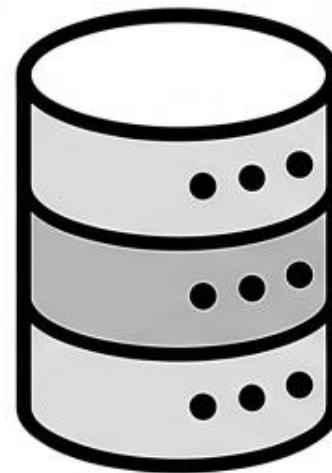
The Physical Legacy



Tens of thousands of paper records obtained from national laboratories with Registrant permission.

The Digital Objective

- Exposure incidents
- Treatment
- Bioassay data



- Internal dose assessments
- External dose

Designed to make data available for research

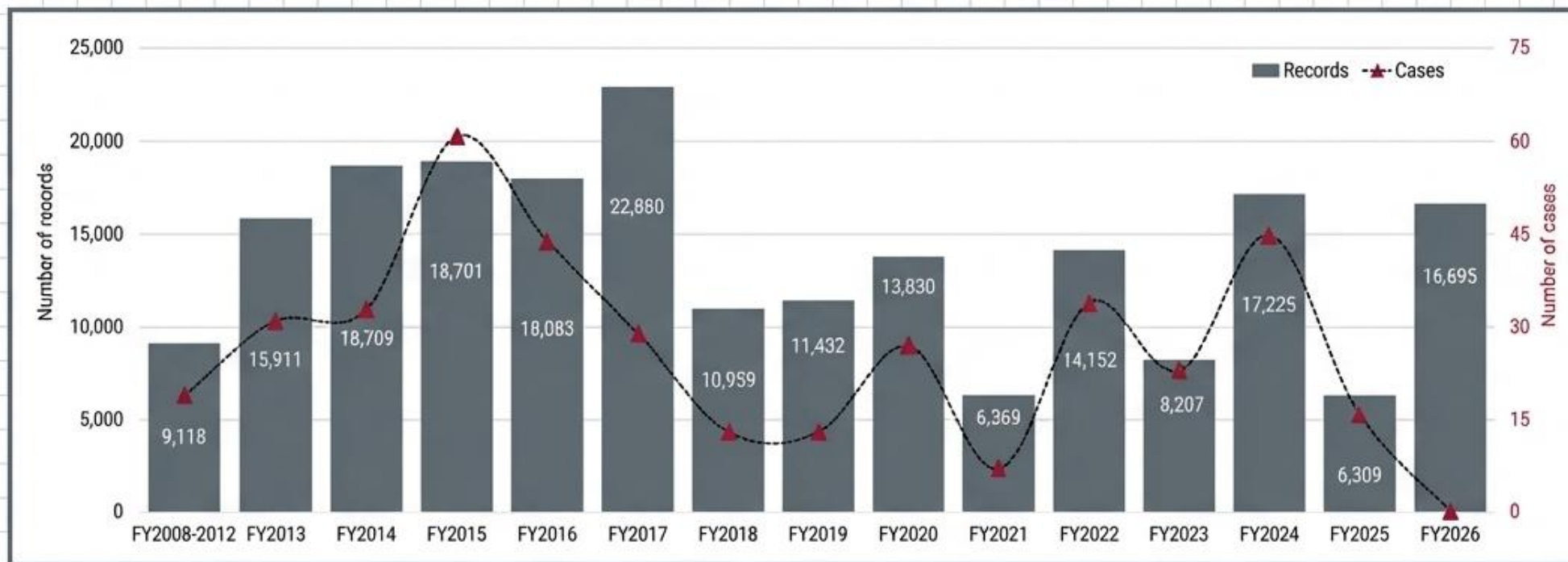


Nearly two decades of sustained data entry yields over 208,000 digitized records.




395 Total Cases

52 whole-body, 332 partial-body, and 11 special study cases

208,836 Total Records

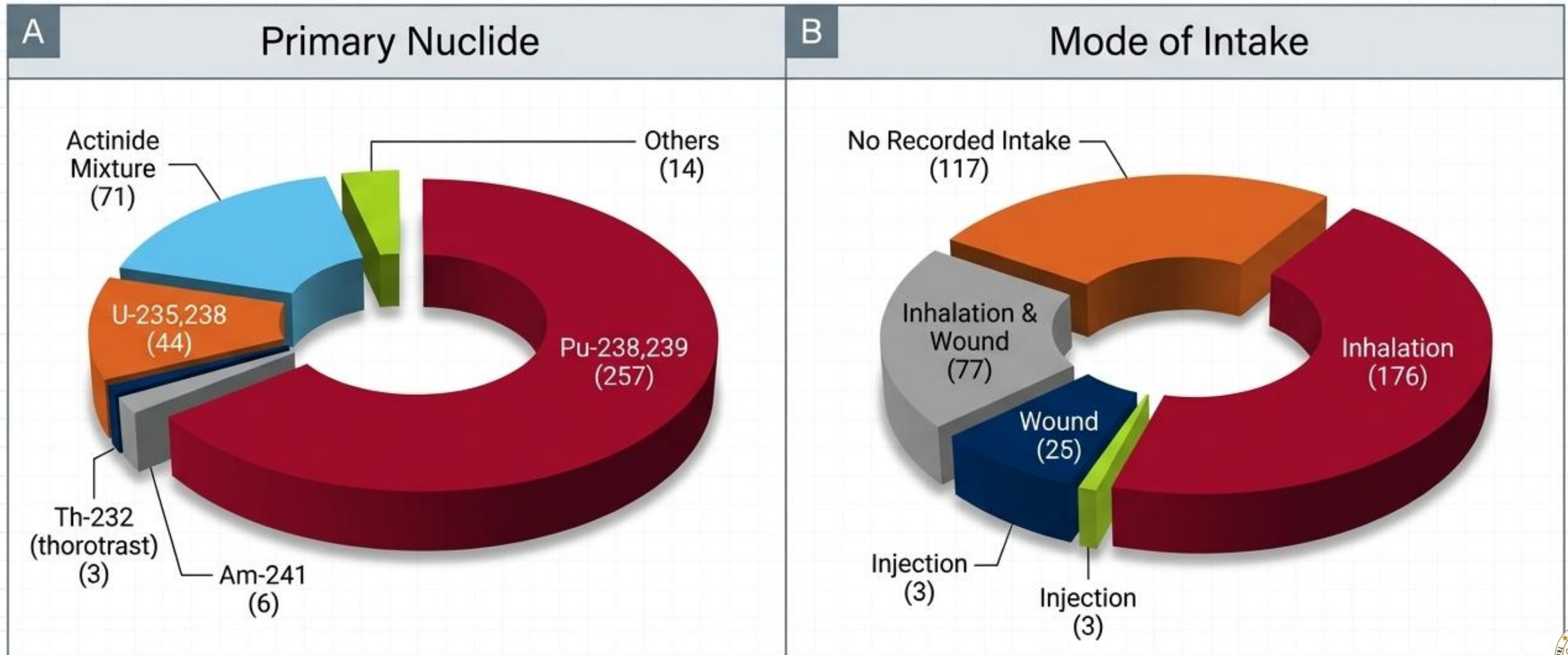


Status

-  Systematic database population started
-  All existing data entry completed!
-  Missing data obtained and currently in progress



Plutonium inhalation represents the primary exposure profile within the registry.



Eight standardized tabs govern the categorization of decades of specialized health physics data.

DSTUR | Data Entry: Health Physics

United States Transuranium and Uranium Registries

Case No: 0000 | Search by Case # | Edit Case #

Intake Type: | Contaminant(s):

Admin | Medical | Sod Chem (EU) | Sod Chem (U) | **Health Physics** | Clinical | Pathology | Neat of Ion | Letters and Labels

Bioassay Summary

Monitoring Type	Count
Blood	1
Urine	3
Lung	1

Detailed Data

Urine | Feces | Blood | Steelens | Lung | Liver | Wound | WEC | All Data | Enter Data

Index

Intake Type: | Contaminant(s): | ICRP 68 Type: | Chemical Form: | HP Entered:

Special Study Groups

Chelation | Wound

Search Options

Quick | Advanced

OLD Health Physics | Case Entry Summary | Lifetime and Yearly External Dose

Notes:

H | < | > | H | Print

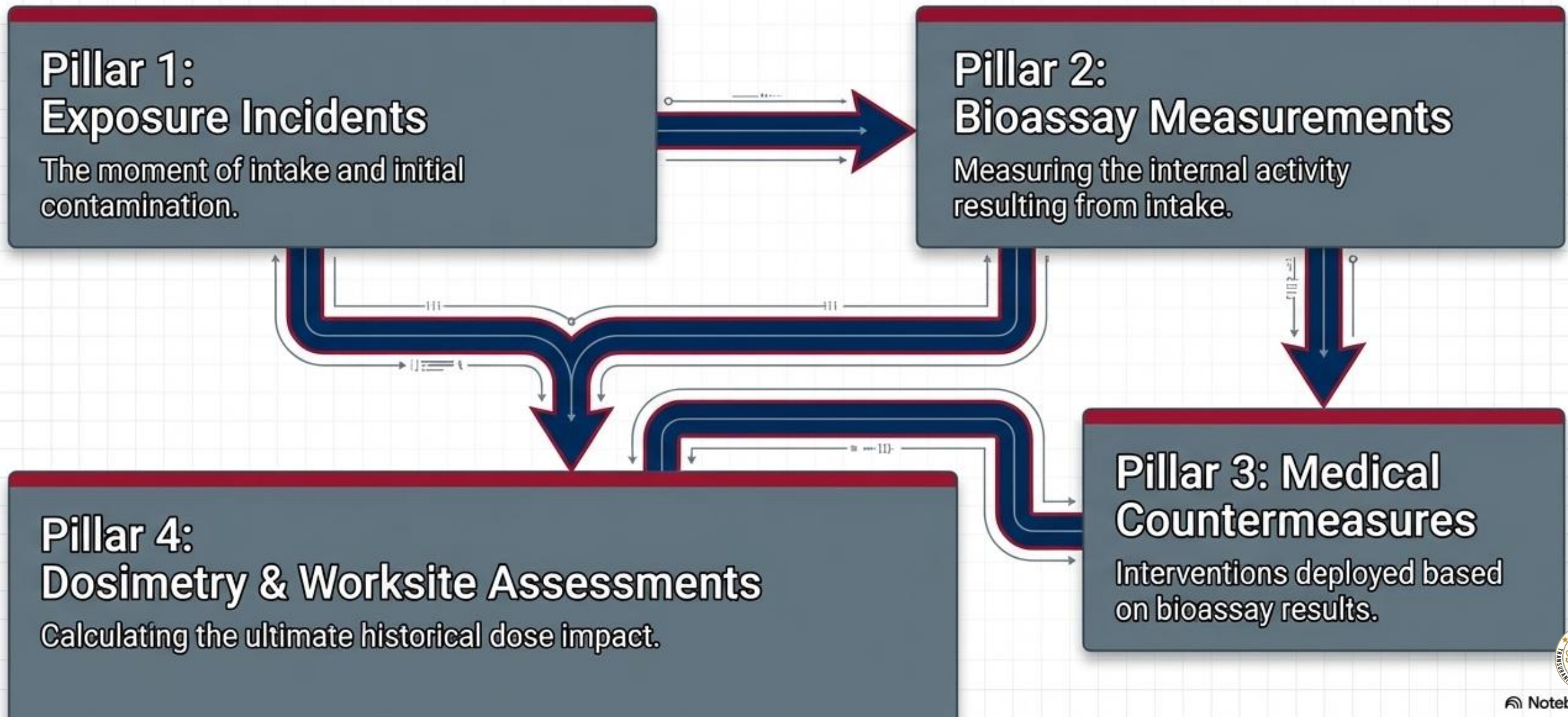
HEALTH PHYSICS DATABASE MANUAL

The Health Physics Database Manual enforces strict data entry guidance and standardizes architecture across eight core modules:

- Incidents
- Contamination
- In Vitro
- In Vivo
- Air Monitoring
- Work Site Assessments
- External
- Treatment

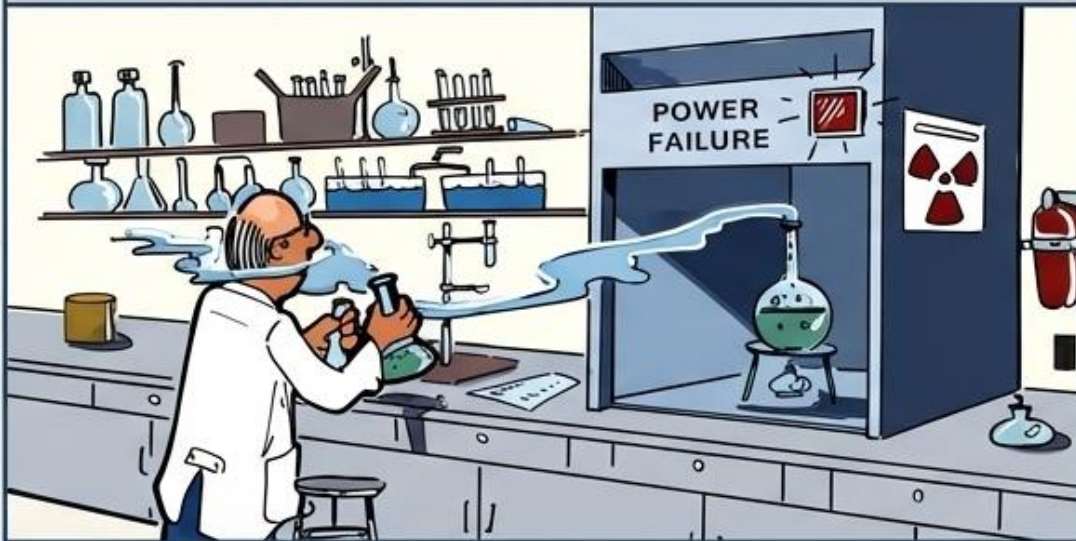


The framework integrates four interconnected pillars of a worker's exposure lifecycle.



Pillar 1 documents the specific parameters of the exposure incident and initial contamination.

Inhalation / Airborne Incidents



- Air sample data
- Exact date, time, and location
- Detailed incident narrative

Wounds / Direct Contact Incidents



- Contamination levels (personal, clothing, workplace)
- Known material characteristics
- Associated fire or explosion parameters

Pillar 2 captures highly specific internal monitoring data across two primary bioassay methodologies.

In Vitro Bioassay



Sample Mediums:	Urine, feces, blood, nasal smear
Tracked Variables:	Sample type (e.g. 24-hr), total volume / mass
Source:	Laboratory measurement methods

In Vivo Bioassay



Scan Targets:	Lung, liver, skeleton, whole-body, wound
Physiological Variables:	Body index, chest wall thickness
Source:	Detector type and material composition (e.g., ppm Am)

Shared Data Requirements:
Measured Activity, Uncertainty, and
Minimum Detectable Activity (MDA)

Pillar 3 records the specific medical countermeasures deployed to reduce internal body burden.

Mechanical: Wound Treatment



Procedures Tracked:

- Excision events
- Irrigation treatments

Crucial Metric:

- Total activity removed

Chemical: Chelation Therapy



Treatments Tracked:

- Chemical Agents: Ca/Zn-DTPA, Ca-EDTA
- Administration Modality: Intravenous (i.v.), Intramuscular (i.m.), Oral

Crucial Metric:

- Exact dosage administered

Pillar 4 synthesizes internal model assumptions with historical external dosimeter readings.

Work Site Assessments



Internal Dose Metrics:

- Recorded Intake
- Calculated Body Burden
- Assigned Effective Dose

Contextual Data: Basis for calculations (urinalyses, lung counts) and historical worksite model assumptions.

External Dose Tracking



Physical Tracking Metrics:

- Recorded Measurement Quantity
- Measurement Period: Interval, Annual, or Lifetime
- Specific Dosimeter Type worn

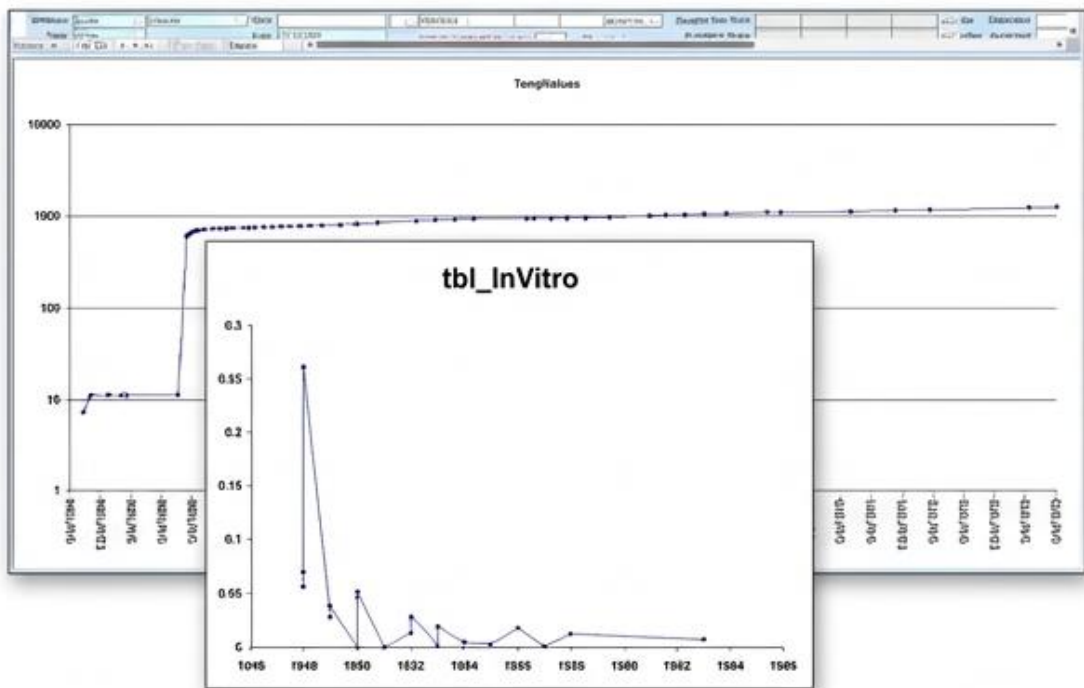
Record volume varies dramatically by worksite, with Hanford dominating external dose and bioassay histories.

	Rocky Flats	Los Alamos	Hanford
Incidents/Contamination/Air	17 / 8 / 2	11 / 0 / 1	52 / 84 / 16
In Vitro Bioassay	233	10	467
In Vivo Bioassay	229	3	73
Worksite Assessments	9	1	117
Treatment (chelation, excision)	5	0	6
External dose	319	147	1,195
TOTAL	822	173	2,010



Automated visualization and summation tools detect anomalies and ensure historical data integrity.

Visualizing Bioassay Excretion Profiles



Automated plotting of bioassay data across time instantly highlights data entry errors or genuine biological anomalies for researcher review.

Verifying External Dose Summation

The screenshot shows a software interface with a table of monitoring data. The table has the following columns: Monitoring Period, Dose Quantity, Date/Time, Reported Results (Value, Concrt, CRIT), Derived Values (Value, Concrt, Exponent, Penos y), Detector Type, and Comments. The data rows show various monitoring periods and dose quantities, with some rows highlighted in blue. The interface also includes a search bar, a reference date field, and several buttons for navigation and actions.

Monitoring Period	Dose Quantity	Date/Time	Value	Concrt	CRIT	Value	Concrt	Exponent	Penos y	Detector Type	Comments
Annual Sum	Dose Equivalent	Start: 1/1/1965 End: 12/31/1965	750			1316.01		0.815	0.7	Noninherent Dim Scintometer	Period order Detector type
Annual Sum	Dose Equivalent	Start: 1/1/1966 End: 12/31/1966	750			1316.01		0.815	0.7	Noninherent Dim Scintometer	Period order Detector type
Annual Sum	Dose Equivalent	Start: 1/1/1967 End: 12/31/1967	750			1316.01		0.815	0.7	Noninherent Dim Scintometer	Period order Detector type
Annual Sum	Dose Equivalent	Start: 1/1/1968 End: 12/31/1968	750			1316.01		0.815	0.7	Noninherent Dim Scintometer	Period order Detector type
Annual Sum	Dose Equivalent	Start: 1/1/1969 End: 12/31/1969	750			1316.01		0.815	0.7	Noninherent Dim Scintometer	Period order Detector type
Annual Sum	Dose Equivalent	Start: 1/1/1970 End: 12/31/1970	750			1316.01		0.815	0.7	Noninherent Dim Scintometer	Period order Detector type
Annual Sum	Dose Equivalent	Start: 1/1/1971 End: 12/31/1971	750			1316.01		0.815	0.7	Noninherent Dim Scintometer	Period order Detector type
Annual Sum	Dose Equivalent	Start: 1/1/1972 End: 12/31/1972	750			1316.01		0.815	0.7	Noninherent Dim Scintometer	Period order Detector type
Annual Sum	Dose Equivalent	Start: 1/1/1973 End: 12/31/1973	750			1316.01		0.815	0.7	Noninherent Dim Scintometer	Period order Detector type
Annual Sum	Dose Equivalent	Start: 1/1/1974 End: 12/31/1974	750			1316.01		0.815	0.7	Noninherent Dim Scintometer	Period order Detector type
Annual Sum	Dose Equivalent	Start: 1/1/1975 End: 12/31/1975	750			1316.01		0.815	0.7	Noninherent Dim Scintometer	Period order Detector type
Annual Sum	Dose Equivalent	Start: 1/1/1976 End: 12/31/1976	750			1316.01		0.815	0.7	Noninherent Dim Scintometer	Period order Detector type
Annual Sum	Dose Equivalent	Start: 1/1/1977 End: 12/31/1977	750			1316.01		0.815	0.7	Noninherent Dim Scintometer	Period order Detector type
Annual Sum	Dose Equivalent	Start: 1/1/1978 End: 12/31/1978	750			1316.01		0.815	0.7	Noninherent Dim Scintometer	Period order Detector type
Annual Sum	Dose Equivalent	Start: 1/1/1979 End: 12/31/1979	750			1316.01		0.815	0.7	Noninherent Dim Scintometer	Period order Detector type
Annual Sum	Dose Equivalent	Start: 1/1/1980 End: 12/31/1980	750			1316.01		0.815	0.7	Noninherent Dim Scintometer	Period order Detector type

The system automatically executes a verification loop: calculating annual external doses by summing entered monthly/quarterly values to explicitly cross-check against reported worksite annual totals.

Closing historical gaps: A multi-year initiative to identify, request, and digitize 41 missing Hanford cases.

Phase 1: 2024 - Oct



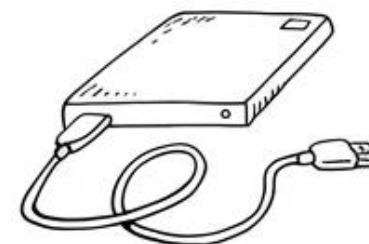
Formal document request initiated for targeted missing records.

Phase 2: 2025 - May



Test package of 2 cases received to optimize the formatting and digital transfer pipeline.

Phase 3: 2025 - Nov



Final package for all 41 cases received via digital transfer.

STATUS: Data Entry Currently In Progress.



The USTUR Health Physics database is fully operational and actively powering next-generation actinide research.

RESEARCH



**Standardized.
Searchable.
Quality-Controlled.
Ready for Analysis.**



Thank you for your attention!
Questions?

