

**MEMORANDUM OF UNDERSTANDING  
BETWEEN THE  
U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES  
AND THE U.S. DEPARTMENT OF ENERGY**

**I. INTRODUCTION**

This Memorandum of Understanding (MOU) serves to set forth the authorities, responsibilities, and procedures by which the Department of Health and Human Services (HHS) and the Department of Energy (DOE) will conduct statutorily mandated activities required to assist with claims processing under the Energy Employees Occupational Illness Compensation Program Act of 2000 (EEOICPA). EEOICPA provides for timely, uniform, and adequate compensation of covered employees and, where applicable, survivors of such employees suffering from illnesses incurred by such employees in the performance of duty.

HHS and DOE will make every effort to ensure that activities conducted under this MOU, as well as those conducted through other mechanisms, are coordinated, non-duplicative, and supportive of a fair and timely compensation program for these workers and their survivors.

**II. BACKGROUND**

EEOICPA, 42 U.S.C. §§ 7384 -7385s-15, establishes a compensation program to provide lump-sum payments and medical benefits as compensation to covered employees suffering from designated illnesses that occurred as a result of their exposure to radiation, beryllium, or silica while in the performance of duty for DOE and certain of its vendors, contractors, and subcontractors. This law also provides for compensation payments to certain survivors of covered employees. In the Ronald W. Reagan National Defense Authorization Act for Fiscal Year 2005, Public Law 108-375 (codified as amended in scattered sections of Title 42 of the U.S.C.), Congress abolished Part D of EEOICPA and created a new Part E in its place. Part E established a new system of Federal payments for employees of DOE contractors and subcontractors, or their eligible survivors, who develop an illness due to exposure to toxic substances at certain DOE facilities.

EEOICPA instructed the President to carry out the compensation program through one or more Federal Agencies or officials as designated by the President. Pursuant to this statutory provision, the President issued Executive Order (E.O.) 13179, entitled "Providing Compensation to America's Nuclear Weapons Workers," which assigned primary responsibility for administering the compensation program to the Department of Labor. This E.O. assigned certain specific responsibilities to HHS and DOE that are enumerated in other sections of this MOU. EEOICPA also instructed the President to establish and appoint an Advisory Board on Radiation and Worker Health (ABRWH or Advisory Board).

### **III. PURPOSE**

This MOU sets forth the guidelines for collaboration between HHS and DOE in carrying out their respective responsibilities under EEOICPA and E.O. 13179. This MOU is not intended to affect existing MOUs and Interagency Agreements (IA) between HHS and DOE or to preclude HHS and DOE from entering into MOUs and IAs for other purposes.

### **IV. AUTHORITIES**

This MOU is consistent with, and is entered into under, the authority of EEOICPA and E.O. 13179.

### **V. RESPONSIBILITIES**

#### **A. General – Executive Order 13179**

The responsibilities assigned to HHS by E.O. 13179 that are relevant to actual or potential interactions between HHS and DOE are as follows:

1. Promulgate regulations establishing:
  - (a) guidelines to assess the likelihood that an individual with cancer sustained the cancer in the performance of duty at a DOE facility or an atomic weapons employer (AWE) facility (42 C.F.R. part 81, “Guidelines for Determining the Probability of Causation under EEOICPA”); and
  - (b) methods for arriving at, and providing reasonable estimates of, the radiation doses received by individuals applying for assistance under EEOICPA for whom there may be inadequate records of radiation exposure (42 C.F.R. part 82, “Methods for Radiation Dose Reconstruction under EEOICPA”).
2. Develop and implement procedures for considering and issuing determinations on petitions by classes of employees to be treated as members of the Special Exposure Cohort (SEC) (42 C.F.R. part 83, “Procedures for Designating Classes of Employees as Members of the Special Exposure Cohort under EEOICPA”).
3. With the assistance of DOE, apply the methods developed under 1.(b) above to estimate the radiation doses received by individuals applying for assistance under EEOICPA.
4. Provide ABRWH with administrative services, funds, facilities, staff, and other necessary support services to carry out its functions under EEOICPA and the Federal Advisory Committee Act.

The responsibilities assigned to DOE by E.O. 13179 that are relevant to actual or potential interactions between DOE and HHS are as follows:

1. Provide HHS and ABRWH access, in accordance with law, to all relevant information pertaining to worker exposures, including access to restricted data, and any other technical assistance needed to carry out their responsibilities.
2. Upon request from HHS, and as permitted by law, requires a DOE contractor or subcontractor to provide information relevant to a claim under EEOICPA.
3. Designate and list AWEs and beryllium vendors pursuant to EEOICPA and update these lists as required.

## **B. HHS Responsibilities**

### **1. Identification of Data Needs**

HHS will evaluate and identify the data, documents, and information that are relevant and necessary for carrying out its responsibilities under EEOICPA, including estimating radiation doses for individual-covered employees with cancer, evaluating petitions by classes of employees for inclusion in SEC, and evaluating residual contamination at AWEs and beryllium vendors.

In conducting these activities, HHS will strive for efficiency in collecting dose reconstruction information from DOE and its site contractors. To accomplish this goal, HHS will search relevant in-house data sources to ensure that requests for access to necessary information are not duplicative. HHS will request from DOE only the data and information HHS believes are relevant to individual worker claims to conduct dose reconstruction or evaluate SEC class petitions. In addition, as feasible, without delaying the individual dose reconstruction process and the consideration of SEC petitions, HHS will work with DOE to identify pertinent existing databases and general information needs relevant for entire processes, buildings, employment groups, or facilities. This approach of first using HHS-held data and information and then collecting individualized data and, in parallel, seeking general and group data will facilitate timely and cost-efficient dose reconstructions and evaluation of SEC class petitions. It is expected that this approach will best enable the expeditious accretion of information and diminish the impact on DOE and HHS resources over time.

The types of individual, group-based, or general information that may be relevant to HHS' responsibility include, but are not limited to, the following:

1. Individual worker-monitoring data, such as dosimeter readings and bioassay sample results;
2. Employment history for individual workers;
3. Group worker-monitoring data;
4. Workplace area-monitoring data;
5. Process description information and process history;
6. Incident, safety, and accident reports;

7. Pertinent excerpts from employee medical records;
8. Information on the quantity and composition of radioactive substances, including the chemical form, particle size distribution, level of containment, and likelihood of dispersion; and
9. Identification, last known address, and phone numbers of current and former supervisors, occupational safety and health staff, and nonsupervisory employees of DOE and its contractors, subcontractors, and AWEs with expertise on items 1-8 above.

A more complete list of information types that may be necessary and relevant for reconstructing doses and evaluating SEC petitions is shown in Table 1, below. HHS is responsible for determining what data and information are necessary for completing dose reconstructions and evaluating SEC petitions and for responding to issues raised by ABRWH and the Centers for Disease Control and Prevention (CDC) contractors.

HHS will be responsible for the management of all data collected by HHS employees and contractors, including data obtained from DOE and its contractors. HHS employees and contractors will safeguard all data in accordance with the National Institute for Occupational Safety and Health (NIOSH) Division of Compensation Analysis and Support (DCAS) and DOE Office of Health, Safety and Security (HSS) Security Plans and policies, as well as guidance under the HHS Information Security Program Policy (<http://www.hhs.gov/ocio/policy/2004-0002.001.html>), and certain DOE Directives pertaining to accessing, safeguarding, and transmitting classified, Unclassified Controlled Nuclear Information (UCNI), and provisions of the Privacy Act:

1. DOE O 205.1A, "Department of Energy Cyber Security Management";
2. DOE P 205.1, "Departmental Cyber Security Management Policy";
3. DOE M 205.1-8, "Cyber Security Incident Management Manual";
4. DOE O 206.1, "Department of Energy Privacy Program";
5. DOE N 206.4, "Personal Identity Verification";
6. DOE O 470.4A, "Safeguards and Security Program";
7. DOE M 470.4-1, "Safeguards and Security Program Planning and Management";
8. DOE M 470.4-4A, "Information Security";
9. DOE M 470.4-5, "Personnel Security, August 26, 2005";
10. DOE O 471.1A, "Identification and Protection of Unclassified Controlled Nuclear Information";
11. DOE M 471.1-1, "Identification and Protection of Unclassified Controlled Nuclear Information";
12. DOE O 471.3, "Identifying and Protecting Official Use Only Information";
13. DOE M 471.3-1, "Manual for Identifying and Protecting Official Use Only Information";
14. DOE M 475.1-1B, "Identifying Classified Information";
15. DOE O 475.2, "Identifying Classified Information";
16. DOE O 5610.2, "Control of Weapon Data";
17. "DOE Operations Security Guide";
18. "DOE Marking Handbook DOE Index of Headquarters Classification Guidance"; and
19. Federal Information Processing Standards Publication (FIPS) PUB 140-2, "Security Requirements for Cryptographic Modules."

Should HHS have a question concerning the proper handling of a particular document or class of documents, HHS will consult with DOE.

HHS amended its Privacy Act Systems of Records for an existing NIOSH System of Records, 09-20-0147, "Occupational Health Epidemiologic Studies - HHS/CDC/NIOSH" on August 15, 2002, and September 29, 2003, to add new routine uses required to carry out EEOICPA responsibilities and to revise the system name.

## 2. Security Clearances

HHS personnel and contractors with appropriate security clearances will review documents and data deemed by HHS to be relevant and necessary for carrying out HHS responsibilities under EEOICPA. HHS will expedite completion of necessary applications for appropriate security clearances to facilitate DOE's clearance determinations and permit entry to DOE and DOE-owned, contractor-operated facilities. HHS will be responsible for costs associated with new investigations and reinvestigations for HHS Federal and contractor employees requiring a DOE security clearance.

## 3. Review of Documents for Classified and Controlled Information

HHS will send to DOE for declassification/decontrol/redaction/review DOE documents marked as containing classified and/or UCNI that HHS identifies as necessary to carry out its responsibilities under EEOICPA for appropriate review for classified and UCNI materials in accordance with DOE policy and the requirements outlined in the NIOSH/DCAS and DOE/HSS Security Plans.

## 4. Protection of Personally Identifiable Information

Information determined to be Personally Identifiable Information (PII) must be protected in accordance with relevant statutes, Office of Management and Budget (OMB) guidelines, and HHS regulations and policies. HHS will follow their agency's Privacy Act regulations and policies which are found at 45 C.F.R. part 5b, *Privacy Act Regulations*, and HHS policies regarding PII may be found at <http://www.HHS.gov>.

For this MOU, all parties agree that PII must be protected in accordance with the Privacy Act of 1974, OMB Circular No. A-130, "Management of Federal Information Resources", and each Agency's regulations and policies. Transmission of data between Agencies will be in accordance with agreed-upon protocols which will, at a minimum, include the following requirements:

1. Data stored on removable media (CD, DVD, USB Flash Drives, etc.) must be protected using encryption products that are certified pursuant to FIPS 140-2.
2. Passwords used in conjunction with FIPS 140-2 certified encryption must meet the current DOE password requirements.
3. Transmission of removable media must be sent by express overnight service with signature and tracking required.

4. Data files containing PII that are being sent by e-mail must be encrypted with FIPS 140-2 certified encryption products.
5. Passwords used to encrypt data files must be sent separately from the encrypted data file; i.e., separate e-mail, telephone call, or separate letter.
6. Web sites established for the submission of information that includes PII must use FIPS 140-2 certified encryption methods.
7. Remote access to systems and databases that contain PII must use two-factor authentication for logon access control.
8. In addition to other reporting requirements, the loss, or suspected loss, of PII must be reported immediately upon discovery to:
  - (a) For DOE, the DOE-Cyber Incident Response Capability (CIRC) (<http://www.doecirc.energy.gov>) and DOE/HSS' Office of Information Management, and HHS/NIOSH's DCAS.
  - (b) For HHS, the HHS PII Breach Response Team (<http://www.hhs.gov/ocio/policy/20080001.003.html>) and DOE/HSS' Office of Information Management.

5. Requesting Data from DOE

HHS will direct requests for exposure information necessary to conduct dose reconstructions or evaluate SEC petitions to DOE or other points of contact identified by DOE. These requests will identify the specific type(s) of information needed and, if appropriate, the identity of the employee(s) whose records are needed. These requests will indicate that a timely response is needed, and if more than 60 days are required to provide the requested information, DOE will notify HHS promptly.

Approximately monthly, HHS will provide to DOE and each designated point of contact a status report describing the number of requests sent, number of responses received to date, and a listing of any requests that are outstanding for more than 60, 90, 120, and 150 days. This report will also identify the status of follow-up requests for information.

## 6. Official Point of Contact

HHS designates the following individual as the official point of contact for this MOU:

Name: John Howard, MD  
Title: Director, National Institute for Occupational Safety and Health  
Address: Patriots Plaza Building  
Suite 9200  
395 E Street, SW  
Washington, DC 20201  
Telephone: (202) 245-0625  
Fax: (202) 245-0628

## C. **DOE Responsibilities**

### 1. Provision of Data to HHS

Upon request by HHS and consistent with applicable law, DOE will provide HHS and HHS contractors with access to, and copies of, data, documents, and information deemed by HHS to be relevant and necessary for carrying out its responsibilities under EEOICPA, including estimating radiation doses for individual-covered employees with cancer, evaluating petitions by classes of employees for inclusion in the SEC, and evaluating residual contamination at AWEs and beryllium vendors. This access includes access to "Restricted Data," as defined in the Atomic Energy Act of 1954, as amended (see 42 U.S.C. § 2014(y)).

DOE will provide HHS with data and information of the types described in section B.1., above, and Table 1, below, as needed and where such information exists, to enable HHS to process current individual dose reconstructions and SEC class petitions and to achieve more timely and cost-effective processing of future dose reconstructions and SEC class petitions. The primary strategy for achieving such increased timeliness and cost-effectiveness will be to provide HHS with information and records on a process, building, employment group, or facility-wide basis, which will gradually reduce, but not eliminate, the need for HHS to request information and records on a case-by-case basis for dose reconstructions and SEC class petitions at the time they are being processed.

HHS and DOE will adhere to the guidance outlined in the NIOSH/DCAS and DOE/HSS Security Plans that describe and establish processes for requesting data, clearance, accessing the site, and resolving security issues as they arise. The Security Plans are an effort to balance the need for protecting classified and controlled unclassified information with the need to fairly adjudicate compensation claims. Revisions to these Security Plans may be required due to changes in governmental security requirements, operational experience, or unexpected events.

DOE and HHS acknowledge that while all the material in section B.1., above, and Table 1, below, is potentially relevant to each claim, the actual data necessary will vary among claims. DOE and HHS also recognize that information about worker exposures will vary from site to site. The Agencies will work cooperatively to coordinate research and data retrieval activities to assist in an efficient and effective claims process.

DOE has established a Privacy Act System of Records, which includes the necessary routine uses required to carry out EEOICPA responsibilities, for the following system of record:

1. DOE-10, "Energy Employees Occupational Illness Compensation Program Act Files."

DOE has amended certain Privacy Act Systems of Records to include new routine uses required to carry out EEOICPA responsibilities for the following systems of records:

1. DOE-5, "Personnel Records of Former Contractor Employees";
2. DOE-33, "Personnel Medical Records";
3. DOE-35, "Personnel Radiation Exposure Records";
4. DOE-38, "Occupational and Industrial Accident Records";
5. DOE-71, "The Radiation Accident Registry";
6. DOE-72, "The DOE Radiation Study Registry";
7. DOE-73, "The US-DTPA Registry"; and
8. DOE-88, "Epidemiologic and Other Health Studies, Surveys and Surveillances."

While DOE will continue to provide the necessary information required to carry out EEOICPA responsibilities, DOE will seek to amend, as needed, its Privacy Act Systems of Records to include a new routine use allowing disclosure to HHS and its contractors pursuant to EEOICPA for the following systems of records and any additional systems of records if necessary:

1. DOE-2, "DOE-Personnel Supervisor Maintained Personnel Records";
2. DOE-13, "Payroll and Leave Records"; and
3. DOE-51, "Employee and Visitor Access Control Records."

DOE maintains a moratorium on the destruction of records that may be useful for epidemiological purposes and under that moratorium will continue to maintain any records that are needed for dose reconstruction and SEC petition consideration. DOE will coordinate any status changes or requests for deviations (i.e., destruction of records under the moratorium) with HHS prior to taking any official DOE actions in this regard.

For the purpose of independently reviewing any records, information, or data that HHS determines are relevant and necessary for carrying out its responsibilities under EEOICPA, and as consistent with applicable laws, DOE will allow HHS personnel, HHS contractors, and members of the Advisory Board with appropriate clearances for access to DOE and DOE-owned contractor-operated facilities. Consistent with applicable laws and regulations, DOE will provide HHS personnel and contractors copies of all records, information, or data deemed relevant by HHS. Based on the requirements of EEOICPA, DOE will provide copies of records, information, and data in a timely manner.

Upon request by NIOSH, DOE will provide certification that record searches requested by NIOSH have been completed. Although DOE will work to provide comprehensive responses to NIOSH requests, additional information relevant to a claim may be identified at a later date. When DOE identifies such additional information, DOE will promptly both notify HHS that the new information has been found and send HHS the additional information.

## 2. Classification of Documents and Security Clearances

DOE and its contractors will continue to perform timely classification reviews of documents and data necessary for HHS to carry out its responsibilities under EEOICPA in accordance with DOE policy, and the DOE and HHS Security Plans developed for EEOICPA. DOE will provide to HHS an estimated timeframe for completing any necessary classification reviews of requested documents. HHS personnel, HHS contractors, and members of the Advisory Board who have appropriate security clearances will, in the course of carrying out their responsibilities under EEOICPA, be permitted to review classified and controlled documents and data to identify those that are needed to carry out HHS responsibilities under EEOICPA. DOE will, wherever possible and in a timely manner, declassify, downgrade the classification, or redact the classified or otherwise controlled information in these documents and data. HHS and DOE have established procedures to address those documents and data that cannot be declassified, but may be necessary to complete dose reconstructions or SEC petition considerations. DOE will assist HHS personnel, including Advisory Board members, and contractors in obtaining appropriate security clearances.

## 3. Protection of Personally Identifiable Information

Information determined to be PII must be protected in accordance with relevant statutes, OMB guidelines, and DOE regulations and policies. Some DOE requirements are promulgated through DOE departmental orders, manuals and guides, which are available at <http://www.directives.doe.gov>/DOE has established requirements for the protection of PII in accordance with the Privacy Act of 1974 and OMB requirements. Specifically, PII information provided by the U.S. Government or other U.S. Government contractors for use in the execution of work under this MOU must be protected in accordance with 10 C.F.R. part 1008, "Records Maintained on Individuals (Privacy Act)", DOE Order 206.1, "Department of Energy Privacy Program", DOE M 470.4-2A, "Physical Protection", DOE M 470.4-4A, "Information Security Manual", DOE M 205.1-8, "Cyber Security Incident Management Manual", and DOE M 205.1-5, "Cyber Security Process Requirements Manual".

For this MOU, all parties agree that PII must be protected in accordance with the Privacy Act of 1974, OMB guidance, and each Agency's departmental policies. Transmission of data between Agencies will be in accordance with agreed-upon protocols, which will, at a minimum, include the following requirements:

1. Data stored on removable media (CD, DVD, USB Flash Drives, etc.) must be protected using encryption products that are certified pursuant to FIPS 140-2.
2. Passwords used in conjunction with FIPS 140-2 certified encryption must meet the current DOE password requirements.

3. Transmission of removable media must be sent by express overnight service with signature and tracking required.
4. Data files containing PII that are being sent by e-mail must be encrypted with FIPS 140-2 certified encryption products.
5. Passwords used to encrypt data files must be sent separately from the encrypted data file; i.e., separate e-mail, telephone call, or separate letter.
6. Web sites established for the submission of information that includes PII must use FIPS 140-2 certified encryption methods.
7. Remote access to systems and databases that contain PII must use two-factor authentication for logon access control.
8. In addition to other reporting requirements, the loss, or suspected loss, of PII must be reported immediately upon discovery to:
  - (a) For DOE, the DOE-CIRC ([www.doecirc.energy.gov](http://www.doecirc.energy.gov)) and DOE/HSS' Office of Information Management, and HHS/NIOSH's DCAS.
  - (b) For HHS, the HHS PII Breach Response Team (<http://www.hhs.gov/ocio/policy/20080001.003.html>) and the DOE/HSS' Office of Information Management.

#### 4. Provision of Other Technical Assistance to HHS

DOE will provide assistance to HHS, upon request, in identifying and accessing information needed to reconstruct radiation doses and evaluate petitions from classes of workers to be included in the SEC, for claims and petitions received from current and former employees, and survivors of DOE and AWE facilities. Other technical assistance will be provided to HHS, upon request, to aid in the development of strategies to identify and prioritize for study DOE/AWE or beryllium vendor facilities where significant contamination may have remained after activities relating to the production of nuclear weapons were discontinued.

#### 5. Timeliness of Provision of Information and Technical Assistance

DOE recognizes that time is of the essence in terms of providing information to HHS. DOE will provide all requested information to HHS in a timely and efficient manner. If the requested information cannot be provided in a timely manner, DOE will provide whatever portion of the requested information is available, as well as an estimate of when the remaining information will be produced. Following transmission of this estimate, DOE will continue to work to provide all requested information to HHS as quickly as possible, unless HHS notifies DOE that the remaining information is not required.

## 6. DOE Contractor and AWE Communication and Assistance

DOE will work with its current and former contractor community and other relevant parties, such as AWEs, to facilitate access to information and records needed by HHS. DOE and HHS will work together to develop clauses to be added to agreements with DOE contractors to ensure that DOE contractors collect and maintain information needed to carry out DOE obligations under this MOU, and that HHS and its agents have the necessary access to that information.

## 7. Official Point of Contact

DOE designates the following individual as the official point of contact for this MOU:

Name: Glenn S. Podonsky  
Title: Chief Health, Safety and Security Officer  
Address: Office of Health, Safety and Security  
U.S. Department of Energy  
Room 7G-040/FORS  
1000 Independence Avenue, SW  
Washington, DC 20585  
Telephone: (202) 287-6071  
Fax: (202) 287-5594

## **VI. DISPOSITION OF RECORDS**

Each party is to be responsible for the disposition of records in its possession in accordance with its own records retention authorities.

## **VII. RESPONDING TO FREEDOM OF INFORMATION ACT REQUESTS**

Determinations regarding release of information exchanged pursuant to this MOU that is responsive to a valid request under the Freedom of Information Act (FOIA), 5 U.S.C. § 552, will be made by the Agency from which the information originated.

## **VIII. DURATION**

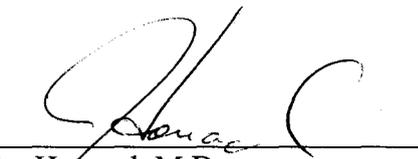
This MOU, effective when signed by both parties, shall initially remain in effect through fiscal year 2015. The parties' current intent is to renew this agreement at that time.

## **IX. MODIFICATION OR CANCELLATION**

This MOU, or any of its specific provisions, may be cancelled or amended by mutual, written agreement of both parties at any time. Cancellation of this MOU by one of the parties may be accomplished by a 90-day advance written notification by either HHS or DOE to the other party.

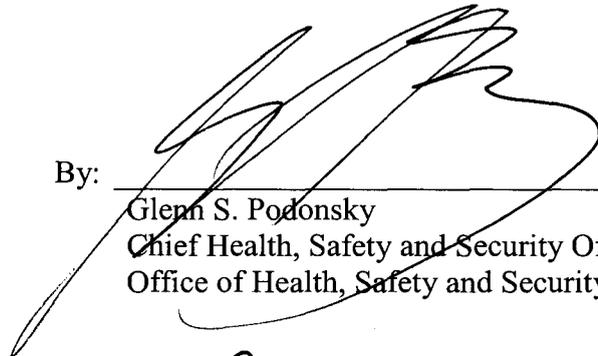
**X. RESPONSIBLE OFFICIALS**

U.S. DEPARTMENT OF HEALTH  
AND HUMAN SERVICES

By:   
\_\_\_\_\_  
John Howard, M.D.  
Director  
National Institute for Occupational  
Safety and Health

Date: 9/17/10

U.S. DEPARTMENT OF ENERGY

By:   
\_\_\_\_\_  
Glenn S. Podonsky  
Chief Health, Safety and Security Officer  
Office of Health, Safety and Security

Date: 8/28/10

**Table 1**  
**Examples of Potentially Relevant Information for Reconstructing Doses  
and Evaluating Special Exposure Cohort Petitions**

The National Institute for Occupational Safety and Health considers the following types of information to be potentially relevant in conducting dose reconstructions and evaluating petitions from classes of workers for inclusion in the Special Exposure Cohort (SEC). The necessity and availability of this information is expected to vary substantially from case to case, and this is not an exhaustive list of all information that may be required for the Department of Health and Human Services (HHS) to perform its duties under the Energy Employees Occupational Illness Compensation Program Act. HHS will attempt to target its requests to those records necessary for specific dose reconstructions or SEC petition evaluations.

Worker-monitoring data

1. external dosimetry data, including external dosimeter readings (film badge, TLD, neutron dosimeters); and
2. pocket ionization chamber data.

Internal dosimetry data

1. urinalysis results;
2. fecal sample results;
3. *in vivo* measurement results;
4. incident investigation reports;
5. breath radon and/or thoron results;
6. nasal smear results; and
7. external contamination measurements.

Monitoring program data

1. analytical methods used for bioassay analyses;
2. performance characteristics of dosimeters for different radiation types;
3. historical detection limits for bioassay samples and dosimeter badges;
4. bioassay sample and dosimeter collection/exchange frequencies; and
5. documentation of recordkeeping practices used to censor data and/or administratively assigned dose.

### Workplace-monitoring data

1. surface contamination surveys;
2. general area air-sampling results;
3. breathing zone air-sampling results;
4. radon- and/or thoron-monitoring results;
5. area radiation survey measurements (beta, gamma, and neutron); and
6. fixed location dosimeter results (beta, gamma, and neutron).

### Workplace characterization data

Information on the external exposure environment, including radiation type (gamma, x-ray, neutron, beta, other charged particle); radiation energy spectrum; uniformity of exposure (whole-body vs. partial-body exposure); irradiation geometry; and work-required medical screening x-rays.

### Information characterizing internal exposure

1. radionuclide(s) and associated chemical forms;
2. results of particle-size distribution studies; and
3. respiratory protection practices.

### Process descriptions for each work location

1. general description of the process;
2. characterization of the source term (i.e., the radionuclide and its quantity);
3. extent of encapsulation;
4. methods of containment; and
5. other information used to assess the potential for airborne dispersion.