

STATUS OF DOCUMENT SEARCH AND
DATA QUALITY OBJECTIVE EFFORTS

Hanford Environmental Dose
Reconstruction Project

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PREFACE

The primary objective of the Hanford Environmental Dose Reconstruction (HEDR) Project is to estimate the radiation dose (with descriptions of the uncertainties inherent in such estimates) that individuals could have received as a result of emissions since 1944 from the U.S. Department of Energy's (DOE) Hanford Site near Richland, Washington. An independent Technical Steering Panel (TSP) directs the project which is conducted by Battelle Pacific Northwest Laboratories (BNW) staff.

A secondary objective is to make Hanford-originated documents of potential interest and/or use and project-generated reports available to the public through the U.S. Government's National Technical Information Service and the DOE Richland Field Office (RL) Public Reading Room, Richland, Washington.

The HEDR Project work is conducted under several technical and administrative tasks, among which is the Information Resources Task. This task identifies, searches for, retrieves, declassifies (if necessary), and makes available to HEDR Project staff and the public those documents essential to meet project needs. Project information needs center around 1) information necessary to estimate doses people may have received and 2) information requested by the public on operational and radioactive material releases. This letter report fulfills HEDR Project Milestone 1103A.

SUMMARY

The purpose of this letter report is to document the status of the identification, search, retrieval, evaluation, declassification and availability of 1) Hanford-Site-originated operating information necessary to reconstruct radiation doses and 2) monitoring information indicating concentrations of radioactive materials in the environment.

All information needed to date to reconstruct the radiation doses has been identified, sought, retrieved, evaluated, declassified, and made available. Any data needed in the future that have not yet been found will be sought using the same search tree method used to identify the Hanford-Site-originated documents up to now. This search tree method has ensured that the data quality objective of completeness is met.

Because there was a centralized list of documents for which we have technical indices (during the sole-contractor eras of E.I. Du Pont de Nemours and General Electric Companies, 1943-1964), the documents through 1964 have been identified, and the document collections are considered as complete as possible. The collection of documents from 1965-1972 is complete for monthly average data but not to the same extent as for the years 1944-1964 where daily and sometimes hourly data are often available and for which a subject index is readily available. From 1965-1972 there were multiple contractors, each maintaining a separate document system with no detailed subject index for retrieval purposes. Because the documents reviewed to date have provided sufficient information to develop source terms (to estimate radioactive releases) it is not expected that an evaluation of the 1965-1972 documents would produce any data that would have a significant effect on source terms.

A HEDR Information Resources Tracking System (HIRTS) database has been established of all documents identified as being of potential interest and/or use to dose reconstruction. The HIRTS contains more than 6000 citations with bibliographic information on each report, document number(s), author(s), title, date, document form (hard copy or microfilm), number of pages, location, public availability, and names of HEDR Project and TSP staff who have requested copies. Until the completion of the HEDR Project, newly identified

and retrieved information will continue to be added to the Information Resources Task database, HIRTS, and made publicly available.

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FIGURE

1 Search Tree Used to Identify Documents of Potential
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INTRODUCTION

The Information Resources Task's goal is to ensure that Hanford-Site-originated documents needed to meet Hanford Environmental Dose Reconstruction (HEDR) Project objectives are identified, located, organized for ready retrieval, and made available to HEDR Project staff and the public in a timely manner. The entire search process employed by the Information Resources Task (Shipler 1991) includes the following activities:

- identifying - screening author, subject, periodical, and serial indices and other computer-generated lists
- searching - physically looking for documents
- retrieving - acquiring documents from their filed, stored, or archived locations
- evaluating - reading documents to determine content and usefulness
- describing - developing annotated bibliographies of reviewed documents
- declassifying - reading of documents by an Authorized Derivative Declassifier to determine whether the document could be declassified as is or declassified with certain material deleted in accordance with directives from originating agencies
- making available - processing and placing documents in the Department of Energy (DOE) Richland Field Office (RL) Public Reading Room in Richland, Washington, and other publicly available locations as well as distributing them to interested Technical Steering Panel (TSP) and HEDR Project staff.

QUALITY ASSURANCE

The data quality objective established for the Information Resources Task is completeness (Shipler 1992, pp. 12.10-12.11). Completeness is necessary as a data quality objective to ensure that all available 1) operating information needed for dose reconstruction and 2) monitoring information indicating concentrations of radioactive materials in the environment will be found. To achieve completeness, the search tree process (see Figure 1) is used to review currently available subject, author, periodical, and serial

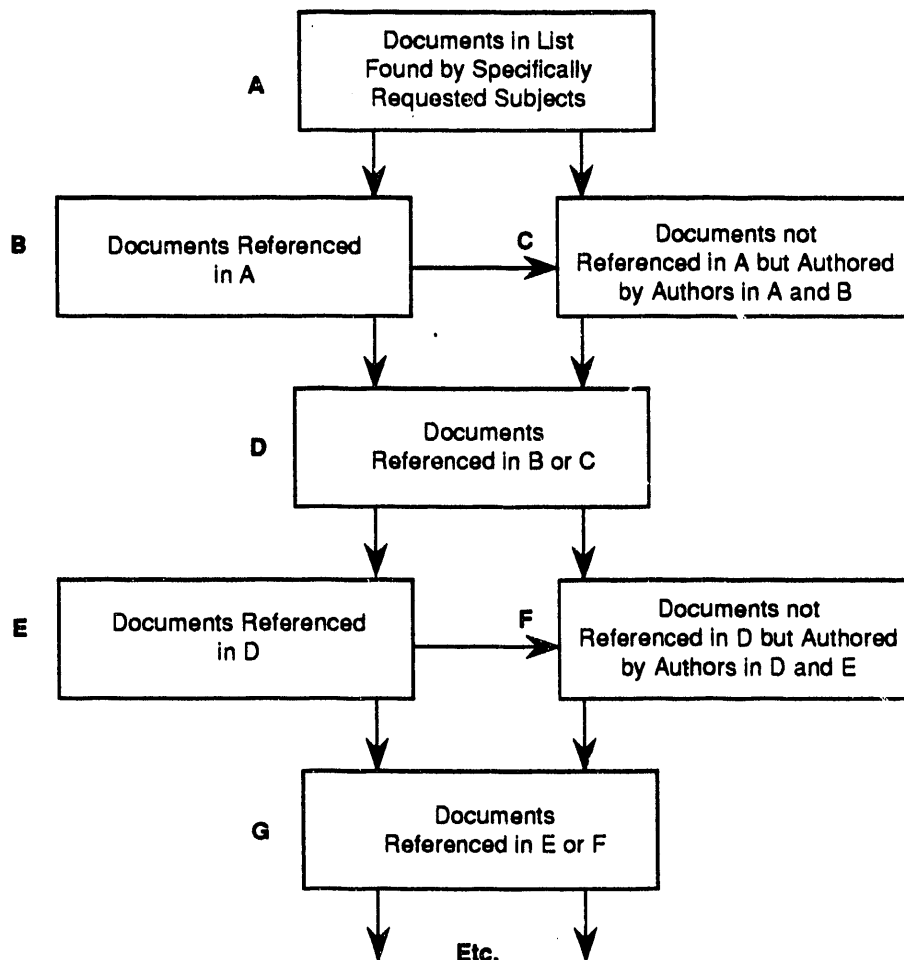


FIGURE 1. Search Tree Used to Identify Documents of Potential Interest and/or Use to the Hanford Environmental Dose Reconstruction Project

indices to archival documents in order to identify and retrieve those of potential interest and/or use to the HEDR Project.

The original plan to conduct a search for the documents necessary to the HEDR Project consisted of looking for document titles, authors, key words, and other sources. The main search source, the Hanford historical card catalog, however, has only certain subject entries, not a dictionary index of key words. Therefore, the search method had to be modified to fit the resource available to be searched. When HEDR Project staff request specific information, the first step is to search the Hanford historical card catalog under the various subject headings that apply to the required information. The titles and authors identified on the subject index cards are then used to seek further titles and authors as shown in the following search method outline:

- I. Specifically requested subject entries in the Hanford historical card catalog
 - A. Document titles
 1. Other subject entries suggested by the initial document titles
 2. Other documents referenced in the documents
 - B. Document authors
 1. Other documents written by referenced authors
 2. Other subject entries suggested by the authors' other document titles
- II. Other sources
 - A. Respective indexes for all periodic and serial documents
 - B. Authors' and associates' files
 - C. Interviews with current and former Hanford employees
 - D. Anecdotal information logs and notes

Achievement of the data quality objective of completeness is addressed at the end of each major search activity (whenever HEDR Project staff request specific data required to perform their tasks) and verified by highly trained search specialists and HEDR Project staff. For each request, initial

document lists are searched and the search tree method used to assure that no document is left unfound. All internal peer reviews are documented and included in the project files. For those documents listed as destroyed, document control clerks survey document destruction cards to ensure that no available documents remain unfound.

APPROACH

BACKGROUND

When the Hanford Engineer Works began in 1943, there was only one prime contractor, E. I. Du Pont de Nemours and Company. The Du Pont Company was succeeded at the end of August 1946 by General Electric Company. Beginning in January 1965, the Hanford Site decentralized from a single contractor (General Electric Company) to multiple contractors: Battelle Pacific Northwest Laboratories for Hanford laboratories operations, Isochem, Inc. for chemical processing, Douglas-United Nuclear, Inc. for fuel preparation and reactor operations, and various other companies for construction engineering, and other support services.

For documents produced during the time of a single contractor at the Hanford Site (1943-December 1964), there was a centralized document list--25 books in three-ring binders on ruled notebook paper. This hand-written list contains approximately 100,000 document titles, each identified by a number preceded by HW. Approximately 40,000 of these documents have been abstracted, indexed, and included in the Hanford historical card catalog. Of the other 60,000 document titles, roughly 30,000 documents were destroyed and 30,000 are in storage.

During the time there were multiple contractors at the Hanford Site (January 1965-1972), there was no centralized Hanford-Site document list nor were technical abstracts prepared. Each contractor had its own document system. For these documents there are databases which contain titles and a limited number of authors for the approximately 19,000 reactor and separations operations documents generated from 1965-1972.

IDENTIFYING DOCUMENTS

The primary tool used to identify documents necessary to the HEDR Project is the Hanford historical card catalog. This is a manual index of Hanford-Site-originated documents which were deemed to be of retrospective technical value to site operations and programs. The catalog contains entries for the approximately 40,000 documents abstracted out of the single-contractor

document list (the approximately 100,000 titles in the 25 books) for the years 1943-1964 and for Battelle Pacific Northwest Laboratories (BNW) originated documents from 1965-1986. These 40,000 documents, indexed by subject, are topical reports judged by a technical abstractor to have potential retrospective value to Hanford-Site operations and programs. The other approximately 60,000 documents, not indexed by subject, are periodical reports, letters, and memoranda judged to have limited potential retrospective value to Hanford-Site operations and programs. No additions have been made to the Hanford historical card catalog since 1986. The Hanford historical card catalog contains subject, author, and number entries for the 1965-1986 BNW-originated documents and for the approximately 40,000 documents for which a 50-100 word technical abstract was written. Periodical and serial indexes are also a part of the catalog.

The primary tools used to identify those documents originated from 1965-1972 by other Hanford contractors are databases which contain titles and a limited number of authors for the approximately 19,000 reactor and separations operations documents.

When a request for specific documents or a specific subject is received, the Hanford historical card catalog or the databases are used to identify subject entries, titles, and authors of documents (both classified and unclassified) that might contain the requested information. All referenced titles and authors are checked as well to help ensure a thorough search.

SEARCHING FOR AND RETRIEVING DOCUMENTS

Once document titles have been identified, the next step is to search for and retrieve the actual documents. To ensure that all necessary Hanford-originated documents are found and made available to HEDR Project staff and the public, the existence or non-existence of Hanford-originated documents has to be determined.

Steps were taken early in the project to ascertain whether the initial prime contractors, Du Pont and General Electric Companies, had retained backup files of Hanford documents they had created. The Information Resources staff learned from discussions with previous employees of Du Pont's Technical

Information Section that one copy of each document generated by Du Pont was sent to Wilmington, Delaware, for its Hall of Records. This transfer of Du Pont records included both classified and unclassified documents. Even though the Du Pont contract terminated in August 1946, Du Pont records continued to be transferred to Wilmington until 1952. Du Pont has stated that the only surviving Hanford documents in their Hall of Records today are payroll records of employees who worked at the Hanford Site.^(a) All others were destroyed or turned over to the Atomic Energy Commission in the mid 1970s. The Atomic Energy Commission in turn transferred the records to the Savannah River Laboratory, Aiken, South Carolina, which maintained custodial responsibility. A search at the Savannah River Laboratory in 1987 provided verification that all but the medical records had been destroyed.^(b)

General Electric Company had a backup file of Hanford-Site-originated documents at its corporate headquarters in Schenectady, New York. This file, known as the yellow copy file, was closed out in August 1956. Documents in this backup copy collection were either destroyed or returned to the General Electric Company, Richland, Washington (General Electric Company 1956, p. Fa-1). The processing of the records for these documents was completed in May 1957 (General Electric Company 1957, p. G-4). In the years that followed, no off-site backup file was maintained. In November 1991, the HEDR staff concluded that General Electric Company did not hold documents of relevance to the HEDR Project that were not already available on site.^(c)

In addition to the above-mentioned one-time off-site locations, a third off-site location known to hold some Hanford documents is the Coordination and Information Center established in 1979 by the U.S. Department of Energy in Las Vegas, Nevada, and operated by Reynolds Electrical and Engineering Company, Inc. (Friesen 1985). The Coordination and Information Center's purpose is to collect and preserve historical documents dealing with off-site radioactive fallout from U.S. testing of nuclear devices. Because this

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- (a) Letter, "Hanford Site - Du Pont Documents," from John W. Keiter, E. I. Du Pont de Nemours and Company, to S.P. Gydesen, BNW, April 2, 1990.
 - (b) Letter, "Health Protection Records - Hanford Engineer Works," from T.R. Coughenour, E. I. Du Pont de Nemours and Company, to S.P. Gydesen, BNW, April 11, 1987.
 - (c) Letter, "Documents Generated by General Electric Company during Its Contract for Operations at Hanford," from D.B. Shipler, BNW, to J.E. Till, TSP, November 4, 1991.

collection of more than 200,000 records includes some Hanford-Site-originated documents and because it was the primary source of information relative to the Off-Site Radiation Exposure Review Project (ORERP), the CIC database was searched for all citations relative to Hanford. The results of the search were compared with the listings in the HEDR Information Resources Tracking System (HIRTS) (a system developed to record the Hanford-Site-originated historical documents). Those few documents which were not on site in 1987 were requested from the CIC, evaluated by HEDR Project staff, and added to the HIRTS database.

Another offsite depository for selected Hanford reports is the DOE Office of Scientific and Technical Information (OSTI), Oak Ridge, Tennessee. Whenever a document cannot be located in the various on-site collections of Hanford historical documents, a search is made of OSTI holdings.

Verification that the off-site locations discussed above do not have Hanford-Site-originated historical documents of potential interest and/or use to the HEDR Project to date that are not already in the HIRTS database ensures that the collection held at the Hanford Site is as complete as possible.

The HIRTS database is not complete for those documents, especially older ones, which were destroyed over the years when the storage retention dates assigned to them were reached or exceeded. Titles of those destroyed documents which were numbered are on record. The means for verifying destruction of numbered documents is the file record cards. These are located in one of two places: the Battelle Pacific Northwest Laboratories Classified Matter Control Center or the Boeing Computer Services Richland Records Holding Area. All operating data originated prior to 1972 that are necessary to the HEDR Project today were classified. All classified documents and any unclassified documents felt to be of retrospective value were assigned numbers when they were originated, and the destruction of documents with assigned numbers was always recorded on the file records cards. Consequently, Battelle staff are assured there are no destroyed operating data necessary to the HEDR Project that have not been identified.

Locations of the existing documents at the Hanford Site are:

- in the Records Holding Area (712 Building) in Richland, Washington, (classified and unclassified documents) and in the Federal Records Center in Seattle (only unclassified documents): 46,000 cubic-foot boxes of retired Hanford records (numbered documents, unnumbered documents, correspondence, notes, etc.) of all contractors, subcontractors, and government agencies at Hanford from 1944-1991. Included in these boxes are the approximately 30,000 single-contractor documents, classified and unclassified, which originated in 1943-1964 and were neither abstracted nor destroyed
- in the Hanford Technical Library: the 40,000 documents numbered with HW for which technical abstracts were written
- in the Westinghouse Hanford Company (3706 Building in the 300 Area, Records Holding Area and Federal Records Center): about 19,000 documents generated from 1965-1972 for which Westinghouse Hanford Company has custodial responsibility.

EVALUATING AND DESCRIBING DOCUMENTS

Once a document is identified, searched for, and retrieved using the above-described BNW procedures, it is evaluated for potential interest and/or use to the HEDR Project. Any documents containing environmental monitoring data or information necessary to develop source terms (to estimate radioactive releases) are referred on to the appropriate task leader. The task leader then evaluates the documents for their pertinence to the HEDR Project objectives.

For example, those documents containing monitoring data relative to Hanford and its environs have been referred to Task 05 (Environmental Monitoring Data), annotated, and entered into the environmental monitoring database. The core collection of documents for that task began with 300 documents (totalling 19,000 pages) known as the 40-year environmental study conducted by BNW for DOE on past radionuclide releases and practices at Hanford. By using the search tree method for every author's name and document title found in the original and referenced document list(s), an additional 418 documents (totaling nearly 21,000 pages) were also annotated and added to Task 05's information resources.

Once a document is found to be of potential interest and/or use to the HEDR Project, its title is then added to the HIRTS database. HIRTS contains

bibliographic information on each report: document number(s), author(s), title, date, document form (hard copy or microfilm), number of pages, location, public availability, and names of HEDR Project and TSP staff who have requested copies. The database currently contains over 6000 citations, from 1944 to the present. Nearly 2000 of the citations are 1) documents that were not originated by Hanford contractors, 2) documents with more than one document number and so cited more than once, or 3) records of the previous destruction of documents which might have been of interest and/or use to the HEDR Project.

DECLASSIFYING DOCUMENTS

Operating data documents needed to reconstruct the radiation dose were previously classified. Before they could be used on an unclassified basis by Battelle staff, the TSP, and the public, they had to be declassified. By April 1992, DOE had formally declared that all Hanford plutonium production and operations-related information generated from 1944-1972 could be declassified.^(a) Consequently, the Hanford information needed to reconstruct dose may now be made available to the public. Any documents found and deemed useful for meeting HEDR Project objectives may be declassified with or without deletions in accordance with DOE guidance by Authorized Derivative Declassifiers.

From March 1987 to date, nearly 5000 Hanford historical documents have been declassified, more than 1600 of which are HEDR Project related. Of these 1600 documents, a letter report (Gydesen 1992a) lists the actions taken on 1429 of the ones generated from 1944-1960 and identified by the TSP and/or the public as warranting additional review to determine potential interest and/or use to the HEDR Project. The Information Resources staff continue to await instruction from the Centers for Disease Control through the DOE to prepare a title listing of currently classified Hanford documents that were originated

(a) The initial authorizing guidance to review those documents generated from 1944-1960 for declassification was given in DOE memorandum, "Change Notice No. 2 to CG-PR-2," from A. Bryan Siebert, Director, Office of Classification, DOE-HQ, February 21, 1990. The second authorizing guidance to review documents generated from 1961-1972 for declassification was given in DOE memorandum, "PR-24 Declassification of Hanford Production and Fuel Cladding Technology," from Roger Heusser for A. Bryan Siebert, Director, Office of Classification, DOE-HQ, April 6, 1992.

from 1961-1972. Upon receipt of this instruction, the Information Resources staff would expect to follow a plan similar to that documented in Gydesen (1992a).

MAKING DOCUMENTS AVAILABLE

Nearly 4000 Hanford-Site-originated documents of potential interest and/or use to the HEDR Project (the 6000 HIRTS entries minus the 2000 entries previously described) have been placed in the RL Public Reading Room and sent to OSTI in Oak Ridge, Tennessee. OSTI abstracts, indexes, and adds the documents to energy databases which can be electronically searched on several commercial systems. The databases of task-specific, evaluated, and annotated documents kept by other HEDR Project tasks in accordance with project guidelines may also periodically be made available to the RL Public Reading Room.

INFORMATION RESOURCES TASK PUBLICATIONS

The project manager and key technical staff requested that the Information Resources Task identify and retrieve daily operating information for the single-pass reactors from startup through shutdown. This was accomplished in 1991 and documented early in 1992 (Gydesen 1992b). It was noted in this report that the daily data for 1960-1964 had all been destroyed by General Electric Company prior to their departure from Hanford. A method for reconstructing the 1960-1964 information to near daily values was recommended by the Source Terms Task staff and the information necessary to support this was collected and published (Gydesen 1992c).

Along with reactor operating information, separations processes data are necessary to develop source terms. From startup in 1944 until shutdown in 1972, three different processes were used at the Hanford Site: Bismuth Phosphate, REDOX, and PUREX. A letter report (Gydesen 1992d) presents a chronology, by process, of the existing documents containing the operating information necessary to develop source terms. When possible, several corroborative sources are also identified.

The data included in the documents cited in the three letter reports (Gydesen 1992b, 1992c, and 1992d) are those necessary for source-term

estimation models, 1944-1972, for air and water pathways (Shieler and Napier 1992). Two other letter reports (Hall 1991a and 1991b) identify references for releases to the atmosphere and the Columbia River through 1957.

CONCLUSIONS

Documents presenting data necessary to develop source terms have been identified, retrieved, and directed to appropriate staff. The collections of documents through 1964 are as complete as possible. The tools to identify documents through 1964 (mainly, the Hanford historical card catalog) meet the needs of the HEDR Project. The collection of documents from 1965-1972 is complete for monthly average data but not to the same extent as for the years 1944-1964 where daily and sometimes hourly data are often available and for which a subject index is readily available. Since the techniques described by the search-tree approach resulted in the searcher meeting herself coming and going with no new citations being evolved, this approach supports a high degree of completeness.

With 46,000 cubic-foot boxes of retired records and more than 59,000 topical technical reports still in existence (the 40,000 in the Hanford Technical Library plus the 19,000 at Westinghouse Hanford Company), it would be foolhardy to ever state that ALL recorded information of potential interest and/or use to the project has been identified, retrieved, and made publicly available. Nevertheless, any unidentified information is not likely to have an effect on reconstructed release quantities or dose estimates.

Until the completion of the HEDR Project, newly-identified and retrieved information of potential interest and/or use to the HEDR Project will continue to be added to the Information Resources Task database, HIRTS, and made publicly available.

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