Technical Report Literature: A Misunderstood Genre

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What are technical reports? Where do they originate? Why do they have so many report numbers? How do I identify them? These and other questions pop into the mind of library staff when confronted with a suspected technical report question. In library school, technical reports are discussed briefly in a government documents or a science and technology reference class, and if taught out of context they can be confusing or intimidating.

Once in the real world, librarians cannot avoid technical reports and a more intimate knowledge of them is required. I approached them slowly and cautiously at first. After all, technical reports are associated with government documents (somehow!) and I knew documents were different. But why did they have so many report numbers? Why were they so frequently available only in microfiche? And how were they useful to regular patrons who were not scientists? Once I understood the answers to these questions, I discovered a valuable source of state-of-the-art information that included subjects ranging from business to criminal justice to biotechnology. Technical reports are a valuable resource in almost all types of reference work.

The purpose of this article is to provide a foundation for understanding the nature of technical report literature and, more specifically, for understanding the National Technical Information Service (NTIS), the central source for public sale of government-sponsored research reports. The discussion will include an overview of technical reports, NTIS, and technical reports reference service.

Overview

Value Of Technical Reports

In 1989, total federal funding for research and development was estimated to be more than sixty-two billion dollars.[1] The results of government-sponsored research and development are frequently made available as a technical report. "Report literature constitutes an information resource which covers a wide range of subject matter and is indispensable to the scientific, technical, and business communities, to various levels of education, and to government itself."[2] Historically, technical reports consisted of scientific and technical information, e.g., aeronautics, nuclear energy, and civil engineering. However, as the federal government provided research and development monies to a more diversified community, the range of subjects reported has come to include personnel management, communication, health care, economics, solar energy, urban planning, water quality, and other areas.

Life Cycle Of A Technical Report

For the purposes of this article, a technical report is defined as the published results of U.S. Government-sponsored research or development. This sponsorship can include full or partial funding which can be received through either a contract or a grant. Contractors and grantees include federal agencies, state and local governments, universities, corporations, and think tanks. The report may be a progress report or a final report.

As specified in the contract between the sponsor and the contractor or grantee, reports are to be submitted to the sponsoring body at periodic intervals. The report provides a detailed description of the research conducted. There are no space restrictions and the report can be quite lengthy (a hundred or more pages) and contain numerous graphs, tables, and illustrations.[3] The sponsoring or performing body then sends a copy to a clearinghouse. Most agencies within the federal government are "obliged by law to make available to the public and private sector the information it gathers and the knowledge it produces."[4] At the clearinghouse, the reports are indexed, abstracted, and disseminated.

There are five major government clearinghouses which receive and disseminate technical reports: the National Technical Information Service (NTIS), the National Aeronautics and Space

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Administration Scientific and Technical Information Facility (NASA/STIF), the Department of Energy Office of Scientific and Technical Information (DOE/OSTI), the Defense Technical Information Center (DTIC), and the Department of Education's Educational Resources Information Center (ERIC).

As mentioned above, the sponsoring or performing body sends a copy of the report to one of the clearinghouses. Ideally, all technical reports would be sent to a clearinghouse. Ideally, the report would be sent to the clearinghouse soon after it was published. However, not all technical reports are sent to clearinghouses and when they are sent, the clearinghouse frequently receives the report after the publication date, e.g., a report with a publication date of 1988 might not be received at NTIS until 1989 or even later. These circumstances make for challenging reference work.

Reports may be acquired from a clearinghouse by: 1. purchasing them individually, 2. receiving them through a standing order subscription, (see NTIS SRIM discussed later), or 3. receiving some of them through a depository program, e.g., GPO or NASA. Some reports are available in paper copy and others may be available only in microfiche. If a report is not available from a clearinghouse, it then becomes necessary to contact the sponsoring body.

Bibliographic access to technical reports can be achieved via paper indexes, commercial online databases, or CD-ROM indexes. Some technical reports are included in OCLC, and in some libraries, technical reports may be in the local public catalog. A numbr of the paper indexes are available through the Government Printing Office (GPO) depository program. Téchnical report online databases are available through DIALOG, BRS, and other services. Online files comprised largely of technical reports include NTIS and DOE. Other files, such as AGRICOLA (which covers the field of agriculture) and COMPENDEX (which covers the fields of engineering and technology), contain appropriate technical reports.

The arrangement of technical reports in libraries can vary. Technical report collections may be housed within the documents department or the microforms department. Libraries that receive paper copies of reports may catalog them individually and integrate the reports into the general collection. Libraries that receive and house a large number of technical reports in microfiche format usually choose not to catalog them. These reports are filed by either accession numbers or report numbers.

Report Numbers

Elements of a technical report bibliographic citation can include:

personal author,
corporate author,
sponsoring body,
report number,
accession number,
contract/grant number,
and a title.

The report, accession, and contract/grant numbers may be unfamiliar bibliographic elements and can be confusing. A single technical report can have one or more report or accession numbers, but will usually have only one contract number. The report and accession numbers are the "call numbers" for a technical report and identify a specific report. Understanding the components of these numbers can make them less mysterious.

The report, accession, and contract/grant numbers are alphanumeric. Report numbers are assigned by the performing or sponsoring body, federal agency, or corporation, to identify its individual reports. The report numbers consist of letters (frequently the initials of a performing or sponsoring body) and numbers.

The accession numbers are assigned by a particular clearinghouse to identify the reports they received. Accession numbers consist of letters indicating the clearinghouse and five or six numbers. An abbreviation for the year may also be included in the accession number. The most common accession numbers begin with: PB, assigned by NTIS; N, assigned by NASA/STIF; DE, assigned by DOE/OSTI; ADA, assigned by DTIC; and ED, assigned by ERIC. The contract/grant numbers are assigned by the sponsoring body to identify all reports which are generated as part of a particular contract or grant.[5]

Let's look at a citation as it would appear in an index:

> DE88010761/GAR PC A08/MF A01
> Oak Ridge National Lab., TN. Carbon Dioxide Information Analysis Center. Bibliography on Tropical Rain Forests and the Global Carbon Cycle: Volume 1, An Introduction to the Literature. C.A.S. Hall, S. Brown, R.N. O'Hara, P.B. Bogdonoff, and D. Barshaw. May 1988, 169 p. ORNL/CDIAC-24-V.1. Contract AC05-84OR21400.

The DE88010761/GAR is an accession number assigned by DOE/OSTI; 88 is an abbreviation for 1988. PC A08/MF A01 is the paper and microfiche copy price code information. Oak Ridge is

the performing laboratory, and it is followed by the title and personal authors. ORNL/CDIAC-24-v.1 is the report number assigned by Oak Ridge National Lab., Carbon Dioxide Information Analysis Center. The Contract number, AC05-84OR21400, was assigned by the Department of Energy.

The National Technical Information Service (NTIS)

The National Technical Information Service is a self-supporting agency within the U.S. Department of Commerce. NTIS is one of the largest and possibly the most well-known clearinghouse. "NTIS is the central source for the public sale of U.S. Government-sponsored research, development, and engineering reports, and for sales of foreign technical reports and other analyses prepared by national and local government agencies and their contractors or grantees."[6]

The mission of NTIS is to receive, index, abstract, announce, and disseminate unclassified technical reports. Under the provision of Title 15 *USC* 1151-1157, NTIS sells technical reports, information products and services, and subscriptions. NTIS receives approximately seventy thousand titles a year, and the total collection approaches two million titles.

The NTIS receives unclassified technical reports and other products from clearinghouses, federal agencies, state and local governments, foreign governments, and private companies. Technical reports sent directly to NTIS are originally indexed and abstracted and are assigned PB accession numbers. Reports received from the clearinghouses will retain the originating clearinghouse's accession number: N, DE, ADA, and ED. When these reports and products are made available, NTIS enters a bibliographic record into its database. The majority of reports indexed are available for purchase, in microfiche, from NTIS. NTIS reports and products are available for searching via the paper index, *Government Reports Announcements and Index (GRA&I);* the microfiche index, *NTIS Title Index;* or by searching the NTIS online database.

The *GRA&I*, a biweekly index, provides access to reports via six indexes: keyword, personal author, corporate author, contract/grant number, and NTIS order (accession)/report number. The front half of the biweekly issues is arranged by broad subject and contains a full bibliographic citation and an abstract of each report. The biweekly indexes are cumulated annually. If available from NTIS, a format price code will be given: PC (paper copy);, MF (microfiche), T (tape), and D (diskette). If the report is not available through NTIS, specific ordering instructions will be given, if possible.

The *NTIS Title Index* is available only in microfiche format and provides indexes by order/report number, personal author, and keyword-out-of-context. The quarterly indexes are cumulated every two years.

The NTIS offers a standing order subscription service called Selected Research in Microfiche (SRIM). SRIM allows libraries to select from over 350 subject categories. The library then receives reports covered by this profile. In 1989, libraries receiving microfiche reports via SRIM paid only $1.25 per report while other customers paid the regular price of $6.95 per report. This reduced price is an incentive for libraries to receive reports in microfiche via SRIM.

Technical reports are a valuable resource in almost all types of reference work.

The Government Printing Office (GPO) and The Clearinghouses

The GPO Federal Depository Library Program and the five federal clearinghouses are separate disseminating bodies. The GPO depository library program primarily disseminates GPO documents that originate from branches of the federal government. A small number of technical reports are available through this depository library program. NTIS and the other federal clearinghouses provide access to government-sponsored research. Most of these reports are non-depository; they do not have Superintendent of Documents classification numbers. Access to the non-depository technical reports is provided by indexes other than the *Monthly Catalog.*[7]

Reference Service

To provide effective technical report reference service, library staff need to become familiar with their library's collection. Does the library acquire technical reports? What indexes or online files are available for use in reference work? If reports are received, which collections are received, e.g., NTIS or ERIC? Where are they, i.e., are some cataloged individually and are they in the main collection or are they in the microfiche collection? Are they arranged by report or accession number? If they

are not received, is there a collection nearby for referral?

Reference work with technical reports can be grouped into three steps: 1. identifying a technical report citation or subject; 2. searching for missing elements using primarily printed indexes; and 3. locating and referring.

Identifying a Technical Report Citation or Subject

To identify a technical report bibliographic citation, look for the characteristic elements. Look for a report, accession, or contract/grant number. These numbers are alphanumeric, e.g., ORNL/CDIAC-24-v.1. Look for an availability or clearinghouse statement, e.g., NTIS. Look for a national laboratory, e.g., Oak Ridge National Laboratory. If you are dealing with a phone question, ask the patron for *all* the information they have. (Patrons frequently do not realize that report numbers are important and may only volunteer data such as title and author.) Identifying a technical report subject requires query negotiation. Ask questions such as, "How much detail do you want about rain forests?" "When in doubt, check NTIS," is a good rule of thumb to follow for technical report identification.

Bibliographic access to technical reports can be achieved via paper indexes, commercial online databases, or CD-ROM indexes..

Searching for Missing Elements

An author, title, keyword or report, accession, or contract/grant number search can be conducted in an index such as *GRA&I*. If your library does not catalog its technical reports and they are arranged by report or accession number, then the reference objective will be to identify a report or accession number. If a corresponding report or accession number is the only missing element, then a quick search can be conducted by searching online, CD-ROM, or the *NTIS Title Index*.

In addition to *GRA&I*, there are two other important technical report indexes: *Energy Research Abstracts (ERA)* produced by DOE/OSTI and *Scientific and Technical Aerospace Reports (STAR)* produced by NASA/STIF. *ERA* indexes a variety of literature including technical reports, journal articles, monographs, theses, and dissertations. *STAR* indexes NASA contractor and grantee reports, translations, and domestic and foreign dissertations and theses. Because NTIS does provide bibliographic access to DOE and NASA reports, these reports are indexed in *GRA&I*. Therefore, some reports may be indexed in two of the three indexes.[8] This indexing duplication can be confusing. Generally, if the subject is specifically related to energy then search *ERA*. If it is aerospace, then search *STAR*, and search *GRA&I* when a more general search is required. (All three indexes are available through GPO: *GRA&I* - SuDoc C51.9/3:, Item 0270; *ERA* - SuDoc E1.19:, Item 0474-A-06; *STAR* - SuDoc NAS 1.9/4:, Item 0830-K).

It is important to remember that indexes only contain reports that the clearinghouse received and indexed during that year. The bibliographic citation's year of publication does not indicate the year of the index to check.[9] As mentioned previously, the sponsoring body does not send all reports in a timely fashion to the clearinghouses. A rule of thumb is to start looking in the year of the index that corresponds with the cited publication date and work forward, e.g., if the cited year of publication was 1987, start looking in the 1987 *GRA&I*, and if not found, then check 1988, 1989, etc. A quicker search could be conducted by searching the *NTIS Title Index*, an online file, or a CD-ROM.

Other sources that may be searched by title include OCLC or the *Monthly Catalog (MC)*. However, it is important to remember the limited coverage of NTIS technical reports in these tools. In a representative sample of 240 NTIS publications from *GRA&I*, only 10 percent were also found in the *MC* and only 30 percent were found in OCLC. NTIS reports (that are also GPO depository) appear five to seven months sooner in *GRA&I* than in the *MC*.[10]

Another reference source is the *Report Series Codes Dictionary*.[11] This index provides access to more than twenty thousand alphanumeric report codes and the corresponding issuing agency. When an unfamiliar report number cannot be deciphered, use this index to look under the report number initials where the issuing agency's entire name is provided. Once this information is located, the search can be continued in other sources.

If the report citation is not verifiable, it may not have been sent to a clearinghouse. It may be necessary to identify the address of the sponsoring body and refer the patron directly to the source. Another option is to conduct an author or subject search in a non-technical report index. This type of search may retrieve similar information that has been written by the author and published as a journal article, a monograph, or as part of a proceedings.

Locating and Referring

With a complete citation in hand, the next step is to locate the report. If your library receives technical reports, then proceed to the microforms department or the general collection. If your library does not receive or is missing the particular report requested, then a referral is in order. There are a number of options:

1. If the report is found on OCLC, perhaps the report can be borrowed from the holding library.

2. Check the surrounding federal document depository libraries to see if any of them maintain a technical report collection. A reference source to help identify this information is the *Directory of Government Document Collections and Librarians.*[12] The special collections index has as a category, NTIS. Also, within the geo-alphabetical index, state and city collections can be browsed. A look in the "Acquires" field for North Carolina, Raleigh, North Carolina State University, shows that the Documents Department receives DOE, NTIS, NASA, and ERIC.

3. If the above two options are not viable, perhaps the patron would like to order the material from NTIS. If the patron will be ordering the report directly, provide the ordering information. This would include the NTIS order/accession number, the price code, and an order form (if possible). The price code is listed as part of the citation in many sources, and the actual prices are listed on the back cover of the weekly issues of *GRA&I.* The order forms are on the last pages of the biweekly issues of *GRA&I.*

Summary

Technical reports are a valuable source of literature in almost all types of reference work. You may be confronted with a report citation at any time because they frequently appear in paper and online bibliographies. To be able to provide reference service or referrals for technical reports, it is important to understand what they are, how they originate, and what reference sources can be used. Even though technical reports may seem to be difficult to locate, there can be a logical approach to providing reference service for them. The information provided will enable you to begin working with reports. Providing reference service for technical reports is an acquired art: you have to dive right in.

References

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