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September 1978

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MASTER

*HANFORD ENGINEERING DEVELOPMENT LABORATORY
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INTRODUCTION

DISTRIBUTION OF THIS DOCUMENT IS UNLIMITED.

AUTOMATED DOCUMENT RETRIEVAL WORKSHOP
DIRECTORY

Linda Sue Boehmer
Manager
Document Systems
3706 Bldg. Rm. 21
942-5633

Gerald Marzyck
Manager
Document Processing & Files
3706 Bldg. Rm. 201-A
942-3023

Theresa Humason
Manager
HEDL Records
3706 Bldg. Rm. 109
942-5931

Weeona Harves
Supervisor
Project DALIS
3706 Bldg. Rm. 302
942-0702

June Isaacs
Supervisor
Microfilm Preparation & Control
3706 Bldg. Rm. 205
942-0616

Jan Jackson
Supervisor
Drawing & Aperture Card Control
3706 Bldg. Rm. 106-A
942-3461

Gerald Main
Supervisor
Data Systems Operation
3706 Bldg. Rm. 27
942-3800

RECORDS MANAGEMENT

RECORDS MANAGEMENT
SUMMARY

DEVELOPMENT OF A SOUND RECORDS MANAGEMENT PROGRAM

- Inventory of Files
- Determine Types of Documents
- Record vs. Nonrecord
- Retention of Documents
- Disposition of Documents
- Identification of Vital Records

ANALYSIS OF VARIOUS FILING SYSTEMS AND EQUIPMENT

- Criteria for Analysis
- Type of Equipment Available
 - Hardcopy filing equipment
 - Microfilm filing equipment

COMPARISON OF HARDCOPY RETRIEVAL VS. MICROFILM RETRIEVAL

- Criteria for Comparison
- Criteria for a Potential Microfilm System

RECORDS MANAGEMENT
SUMMARY
(cont'd)

MICROFILM LEGALITY

FINAL DISPOSITION OF HARDCOPY

- Records Center
- Destroy
- Recycle

Hanford Engineering Development Laboratory		INVENTORY OF OFFICE RECORDS				AS OF:		PAGE _____ OF _____	
DEPARTMENT		SECTION OR OPERATION		CUSTODIAN'S NAME		ORG. CODE		AREA	BLDG. ROOM
1. FILING CODE	2. DESCRIPTION	3. RETENTION VALUE		4. TIME REQUIRED IN ACTIVE FILE (MO OR YRS)	5. DATE OF OLDEST RECORD IN EACH FILE (MO YR)	6. LOCATION OF RECORD COPY IF LISTED COPY IS REFERENCE ONLY	7. LINEAL INCHES OF FILE MATERIAL		
		REFERENCE ONLY	RECORD COPY						
1									
2									
3									
4									
5									
6									
7									
8									
9									
10									
11									
12									
13									
14									
15									
16									
17									
18									

AMOUNT OF FILED MATERIAL ELIMINATED DURING THIS INVENTORY →

CU. FT.

1 BOOK CASE SHELF = 2 FT.³

1 LETTER SIZE FILE DRAWER = 1.5 FT.³

1 LEGAL SIZE FILE DRAWER = 1.75 FT.³

ADP CARDS: 1 LINEAL FT. = .18 FT.³

1 WASTE BASKET = 1 FT.³

FIVE BASES FOR EVALUATING RECORDS

- Legal
- Historical
- Administrative
- Scientific
- Research

RECORDS CYCLE

24.1% - DISPOSED OF
32.3% - TRANSFERRED TO
A RECORDS CENTER

Association of Records Managers
and Administrators Annual Conference
Houston, TX October, 1977

RECORDS INVENTORY AND DISPOSITION SCHEDULE

1. NUMBER ORGANIZATION CODE
PAGE 1 OF

2. ORGANIZATIONAL UNIT

DEPARTMENT OR SECTION

3. DATE

4. APPROVAL SIGNATURES

FILES CUSTODIAN (SECRETARY/CLERK)

IMMEDIATE MANAGER OR SUPERVISOR

COMPANY RECORDS MANAGER

5. ITEM NUMBER	6. FILING UNIT TITLE AND DESCRIPTION	7. RETENTION PERIOD	8. DISPOSAL AUTHORITY	9. CUT-OFF INSTRUCTIONS AND RETIREMENT PERIOD
FILING SYSTEM NUMBER	SEPARATE RECORD FROM NONRECORD <u>RECORD:</u>			
OR	DOCUMENTS, PHOTOGRAPHS, VIDEO TAPES, MAGNETIC TAPES, MICROFILM, RADIOGRAPHS, BOOKS, PAPERS, MAPS, ETC., THAT CONTAIN <u>LEGAL, HISTORICAL, ADMINISTRATIVE,</u> <u>SCIENTIFIC OR RESEARCH INFORMATION</u>	HOW LONG SHOULD RECORD BE KEPT?	BY WHAT/WHOSE AUTHORITY?	WHAT EVENTUALLY HAPPENS TO DOCUMENTATION?
OTHER IDENTIFI- CATION	FSAR	UNTIL DIS- MANTLEMENT OR DISPOSAL OF FACILITY	0230, ANNEX C-12, ITEM 2	RETIRE M/F TO THE RHA. RECYCLE HARDCOPY WHEN NO LONGER REQUIRED IN OFFICE.
	HEDL CORRESPONDENCE (INCOMING & OUTGOING)	15 YEARS	0230, ANNEX C-13, ITEM 11.B	RETIRE M/F TO THE RHA. RECYCLE HARDCOPY.
	<u>NONRECORD:</u>			
	REFERENCE COPIES, EXTRA OR DUPLICATE COPIES, ETC.			WHERE IS RECORD COPY?
	LETTERBOOKS	2 YEARS	NONRECORD	RECYCLE. RECORD COPY IN CENTRAL FILES.

DISPOSITION OF DOCUMENTS

- Active records should be kept in office.
- Inactive records should be kept in a Records Holding Area/Records Center.
- Destroy/recycle records no longer required.
- If microfilmed, hardcopy should be recycled if it meets criteria.

ADDITIONAL LEGAL AND REGULATORY REQUIREMENTS

- RDT Standard F 2-2, "Quality Assurance Program Requirements"
- American Society Mechanical Engineers (ASME) Boiler and Pressure Vessel Code, Section III, "Rules for Construction of Nuclear Power Plant Components"
- Code of Federal Regulations, 10CFR50
- State of local regulatory agencies
- ANSI N45.2.9, "Collection, Storage and Maintenance of Nuclear Power Plant Quality Assurance Records"
- PSAR (Preliminary Safety Analysis Report)
- FSAR (Final Safety Analysis Report)

CRITERIA FOR DETERMINING VITAL RECORDS

Vital Records vary depending upon the type of business. They should be stored off site, well protected from floods, fire, earthquakes, sabotage, etc. They can be either hard copy or microfilm.

1. What records are essential to the emergency operations of your company?
2. What records are essential to re-establishing normal operations of your company?
3. What records are required to recreate your company's legal and financial position?
4. What records are necessary to protect and insure the rights and interests of the public and individuals or organizations served by your company?
5. What records are necessary to protect the right and interests of your company as a corporation or private enterprise?

Some Vital Records that must be maintained:

GENERAL

- Personnel Register Showing Employee Skills, with Address & Phone Numbers
- Salary Information
- General Ledger Trial Balance
- Policy & Procedure Manuals
- Organization Charts
- Accounts Receivable

CRITERIA FOR DETERMINING VITAL RECORDS (cont'd)

- Incorporation Certificate
- By-Laws
- Stock Record Books
- Board of Directors' Minutes

MANUFACTURING

- Specifications
- Engineering Drawings
- O & M Manuals
- Property Records

BANKING INSTITUTIONS

- Status of Depositors' Accounts
- Loan Accounts
- Accounts with Other Banks

VITAL RECORDS PROGRAM PLAN

1. Identify vital records.
2. Develop a procedure for safeguarding them on a timely basis.
3. Follow the procedure.
4. Audit the procedure....simulate a disaster.

CRITERIA FOR DETERMINING VITAL RECORDS (cont'd)

- Are the vital records you have selected all that are required to get the company back in business?
- Are the records up to date? Have obsolete records been removed?
- Can records be easily retrieved?
- Are the records legible and can they be reproduced?

DIRECTORY OF COMMERCIAL RECORDS STORAGE FACILITIES

Association of Records Managers and Administrators, Inc.

P.O. Box 281

Bradford, Rhode Island 02808

CRITERIA FOR ANALYZING FILING SYSTEMS AND EQUIPMENT

1. DOCUMENT ACCESSIBILITY

- Would the user have to travel back and forth to a central location?
- Would more than one copy of each document have to be made in case of more than one user?

2. DOCUMENT SERVICING AND CONTROL

- How many man hours would be required to pull requests and prepare chargeout cards?
- To file returned documents?
- To follow-up on unreturned documents?
- For routine document maintenance?

3. RETRIEVAL SPEED AND COSTS

- How much time would be spent in actually finding the requested information?

4. DOCUMENT PRINTING AND DISPOSITION

- What are the costs for printing, collating and packaging hardcopy documentation?
- Do the documents have to be shipped off-site?
- Would a time delay in printing cause any problems?

CRITERIA FOR ANALYZING FILING SYSTEMS AND EQUIPMENT (cont'd)

5. UPDATING AND MAINTENANCE OF DIRECTIVES, MANUALS AND CATALOGS

- Do the updates have to go to various file locations? What is the cost?
- Is staff adequate to prevent delays in individual updating?
- Is storage/file area adequate for housing large, frequently used manuals?
- Can manuals, catalogs, etc. be kept intact and in good condition?

6. FILE INTEGRITY

- What will be the percentage of filing errors?
- What happens if the hardcopy document is lost or accidentally destroyed?
- What if the user fails to return the documents?

7. DOCUMENT PRESERVATION AND PROTECTION

- What measures will be taken to prevent wear and defacement of valuable, irreplaceable documents?
- How will indispensable operating records be protected against a disaster?

CRITERIA FOR ANALYZING FILING SYSTEMS AND EQUIPMENT (cont'd)

8. EQUIPMENT AND SPACING FOR DOCUMENT STORAGE

- Is there available, adequate space to house the documentation in hardcopy?
- Are any building modifications necessary?
- What are the space costs?
- Are there any installation costs?
- What are the equipment costs?
- Is there someone in-house who can perform routine maintenance on mechanized files?
- Would files ever have to be moved/relocated?

HARDCOPY RETRIEVAL VS. MICROFILM
RETRIEVAL DO A FEASIBILITY STUDY

GATHER THE FACTS:

1. Mailed Questionnaires
2. Personal Interviews
3. Personal Observations
4. Existing Reports

CRITERIA TO COMPARE HARDCOPY RETRIEVAL VS. MICROFILM RETRIEVAL

1. What is the purpose of the record and how is it used?
2. What is the retention of the record? How long must it be kept?
3. What is the present file volume, growth rate and estimated future size?
4. What are the various document colors (what percentage), the various document sizes and are the documents legible? What is the condition of the documents?
5. How many references are made annually, monthly, weekly, daily?
6. What is the predictability of the users' needs and the way in which they will ask for documents?
 - Do users ask for information in a variety of ways and are their needs continually changing?
 - Are users' needs complex and do they require precise information? Must the information be correlated or manipulated?
7. Is it necessary to conduct coordinate-type searches to identify those documents, persons, places, or things which meet a particular set of criteria?
8. How long does it take to retrieve the record?
 - Is the timing satisfactory, accurate and reliable?
9. What are the users' requirements/needs for retrieval?

CRITERIA TO COMPARE HARDCOPY RETRIEVAL VS. MICROFILM RETRIEVAL (cont'd)

10. If the system is to be used for retrieving information by subject, what are the average number of indexing terms that will be assigned each document and the total number of indexing terms for the system?
 - It is necessary to know the average number of indexing terms to be used per search, the average number of searches per day, and the extent of workload fluctuations and peakloads.
 - Be able to provide the user with an index they can work from.
11. Who are the users? How many users are there? Where are they physically located?
12. What is the nature and frequency of additions, deletions and changes?
13. How many pages per average document?
14. What is the filing arrangement and indexing system presently being used?
 - What problems are being experienced in the existing system, and what are the consequences of these problems?
15. How would you control access to limited use documents if you went to microfilm?
 - Choose not to microfilm them?
 - Put microfilm in a special vault?
 - Use a special computer code for retrieval?

CRITERIA TO COMPARE HARDCOPY RETRIEVAL VS. MICROFILM RETRIEVAL (cont'd)

16. What is the cost of the present system?

- Labor, space, material, equipment, and where applicable, postage?
- Spacing savings ranks high if new construction or moving to a larger quarters would be required to stay with hardcopy.

CRITERIA TO DETERMINE THE POTENTIAL FOR A MICROFILM SYSTEM

1. Will the recorded information be in continuous use for a long period?
2. Is the information needed at a single location where there is a high reference rate, or at numerous locations having moderate to high reference rates?
3. Will the microfilm system have a proven capability to meet known user requirements?
4. Can the existing system meet user requirements for information as effectively as the proposed microfilm system, even if the existing system is improved to operate at top efficiency?
5. Do requirements call for immediate access to an entire file of information at one time?
6. Is maintaining file integrity important?

If a potential for a microfilm system is there:

- Complete a cost-benefit study comparing the existing system to the proposed system.
- Include: Labor, equipment, space, etc.
- Determine the Documentation to be microfilmed.
 - Record only
 - Record and selected nonrecord working files
 - Selected record only
 - Other

EVALUATION QUESTIONNAIRE

DEPARTMENT/SECTION _____

FILES LOCATION _____

NO. OF EMPLOYEES USING FILES _____

BRIEF DESCRIPTION OF RECORD CONTENT _____

YES NO

1. WILL THE INFORMATION BE KEPT FOR 5 OR MORE YEARS? _____

2. WILL THE INFORMATION BE USED CONTINUOUSLY? _____

3. IS THE INFORMATION REQUIRED IN JUST ONE LOCATION?
OR IN SEVERAL LOCATIONS? _____

4. ARE THE VARIOUS DOCUMENTS LEGIBLE FOR MICROFILMING?
BRIEFLY - WHY NOT & WHAT PERCENTAGES?

5. DO USERS ASK FOR INFORMATION IN A VARIETY OF WAYS? _____

6. DO USERS REQUIRE COORDINATE-TYPE SEARCHES? _____

7. DOES PRESENT RETRIEVAL RATE SATISFY USER? _____

8. DOES EXISTING SYSTEM MEET USERS NEEDS? _____

9. DOES EXISTING SYSTEM HAVE FILE INTEGRITY? _____

10. ARE USERS SATISFIED WITH PRESENT SYSTEM? _____

COMPARATIVE COST EVALUATION

SYSTEM A: _____

SYSTEM B: _____

Factors	PRESENT SYSTEM		PROPOSED SYSTEM	
	Cost	Explanation	Cost	Explanation
LABOR				
Sorting	\$		\$	
Staple Removal				
Coding				
Filing/Refiling				
Retrievals				
Filming				
Processing				
Splicing				
Indexing				
TOTAL LABOR				
MATERIALS				
Folders				
Film & Processing				
Cartridges				
Jackets/Cards				
Print Paper				
TOTAL MATERIALS				
SPACE				
EQUIPMENT				
Cameras				
Readers				
Reader Printers				
Processor				
Housing/Filing				
Maintenance				
TOTAL EQUIPMENT				
TOTAL ANNUAL COSTS	\$		\$

MICROFILM LEGALITY

- Information procedures must be established to avoid inadvertent copying or microfilming of copyrighted and proprietary documentation.
- Because of copyright laws, if copyrighted information is to be copied or microfilmed, prior written consent must be obtained from the copyright holder.

BERKEY

ESTABLISHED IN 1936

GRAPHIC MICROFILM CORPORATION

A DIVISION OF BERKEY K+L CUSTOM SERVICES INC.

222 E. 44th ST. N.Y., N.Y. 10017 (212) 661-5600

A DIVISION OF

Berkey
Photo Inc.

CERTIFICATE OF AUTHENTICITY

START

THIS IS TO CERTIFY THAT THE MICROPHOTOGRAPHIC IMAGES
APPEARING ON THIS ROLL OF MICROFILM:

STARTING WITH _____

ARE ACCURATE REPRODUCTIONS OF THE RECORDS OF:

AND WERE MICROFILMED IN THE REGULAR COURSE OF
BUSINESS PURSUANT TO ESTABLISHED ROUTINE COMPANY
POLICY FOR SYSTEMS UTILIZATION AND OR FOR THE MAINTENANCE
AND PRESERVATION OF SUCH RECORDS THROUGH THE
STORAGE OF SUCH MICROFILMS IN PROTECTED LOCATIONS.

IT IS FURTHER CERTIFIED THAT THE PHOTOGRAPHIC PROCESSES
USED FOR MICROFILMING OF THE ABOVE RECORDS
WERE ACCOMPLISHED IN A MANNER AND ON MICROFILM
WHICH MEETS THE RECOMMENDED REQUIREMENTS OF THE
NATIONAL BUREAU OF STANDARDS FOR PERMANENT MICRO-
PHOTOGRAPHIC REPRODUCTIONS.

Date Microfilmed

Camera Operator

Location

Authorized Signature

BERKEY

ESTABLISHED IN 1936

GRAPHIC MICROFILM CORPORATION

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222 E. 44th ST. N.Y., N.Y. 10017 (212) 661-5600

A DIVISION OF

Berkey

Photo Inc.

CERTIFICATE OF AUTHENTICITY

END

THIS IS TO CERTIFY THAT THE MICROPHOTOGRAPHIC IMAGES
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ENDING WITH _____

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POLICY FOR SYSTEMS UTILIZATION AND OR FOR THE MAINTENANCE
AND PRESERVATION OF SUCH RECORDS THROUGH THE
STORAGE OF SUCH MICROFILMS IN PROTECTED LOCATIONS.

IT IS FURTHER CERTIFIED THAT THE PHOTOGRAPHIC PROCESSES
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ACCOMPLISHED IN A MANNER AND ON MICROFILM WHICH MEETS
THE RECOMMENDED REQUIREMENTS OF THE NATIONAL BUREAU OF
STANDARDS FOR PERMANENT MICROPHOTOGRAPHIC REPRODUCTIONS.

Date Microfilmed

Camera Operator

Location

Authorized Signature

CRITERIA FOR CHOOSING A RECORDS CENTER TO FIT YOUR NEEDS

INVESTIGATE THE FACILITY

1. Does the facility really have the capability to store and protect records adequately?
2. Is the facility secure from natural disasters and malicious destruction?
3. Can the facility provide efficient retrieval at reasonable cost?
4. How fast can records be accessed and retrieved?
5. Do you pay for retrieval, or is that part of the storage costs?
6. Is the facility climatically controlled to house microfilm, video tapes, radiographs, magnetic tapes, etc.?
7. Does the facility assure adequate space for future storage needs?
8. Does the facility have good security, including fire control equipment?

ASSOCIATION OF RECORDS MANAGERS AND ADMINISTRATORS

P.O. BOX 281
BRADFORD, RHODE ISLAND 02808

DIRECTORY OF COMMERCIAL RECORDS STORAGE FACILITIES

NAME AND ADDRESS (BY STATE)	SERVICES - - - SEE CODE BELOW						
	1	2	3	4	5	6	7
ARIZONA AMK MICROFILM & RECORDS STORAGE 2326 NORTH 22ND AVENUE PHOENIX, AZ 85009 602/254-1179	X	X		X			X
CALIFORNIA METRO RECORDS MANAGEMENT INC. 1324 E. 6TH STREET LOS ANGELES, CA 90021 213/489-5990	X	X	X	X	X		
KANSAS UNDERGROUND VAULTS & STORAGE INC. P. O. Box 1723 HUTCHINSON, KA 67501 316/663-5434	X	X	X	X	X	X	X
NEW JERSEY LEAHY BUSINESS ARCHIVES P. O. Box 158 WHITE HOUSE STATION, NJ 08889 201/534-4314	X	X	X	X	X	X	X
PENNSYLVANIA NATIONAL UNDERGROUND STORAGE CO. P. O. Box 68 BOYERS, PA 16020 412/794-8474	X	X	X	X	X	X	X

SERVICE CODES:

1. PAPER RECORDS STORAGE	5. TAPE AND DISC STORAGE
2. REFERENCE SERVICE	6. VITAL RECORDS STORAGE
3. SECURITY STORAGE PAPER RECORDS	7. MICROFILM SERVICES
4. MICROFILM STORAGE	

HOW TO COMPUTE SAVINGS:

- Hardcopy Documentation

1 cu ft = 30 lb = 67 boxes/ton

- Computer Paper

1 1/2 cu ft = 50 lb = 40 boxes/ton

- IBM Cards

1 box (2000 cards) = 10 lb = 200 boxes/ton

HOW TO COMPUTE SAVINGS:

<u>EQUIPMENT</u>	<u>ONE TIME COST</u>	<u>OCCUPIES</u>	<u>HOLDS</u>
3-SHELF BOOKCASE	~ \$100	8.5 SQ FT	6.0 CU FT
5-DR. LETTER FILE CABINET	~ \$150	6.0 SQ FT	7.5 CU FT
5-DR. LEGAL FILE CABINET	~ \$165	7.0 SQ FT	8.75 CU FT

FORMULA FOR COSTS:

Dollar Value of Recycled Documentation if Stored in 5-dr.
Letter-Size File Cabinets in the Office

Recycle Boxes ÷ 7.5 cu ft = Files Required

Files @ \$150/each = Equipment Costs

+ Office Space

5-dr. File Cabinet Requires 6 sq ft of Space

of Files x 6 sq ft @ \$/sq ft = Space/Office Costs

Equipment Costs + Office Costs = Storage Costs

RECORDS MANAGEMENT

To Make Paper & Information
Processing

- * MORE EFFECTIVE
- * MORE EFFICIENT
- * MORE ECONOMICAL

THRU

Systematic Control Over...

- * Creation
- * Maintenance

of Records

ESTABLISHING A MICROFILM SYSTEM

ESTABLISHING A MICROFILM SYSTEM

SUMMARY PART ONE

MICROFILM CHOICES

- Roll Film
- Microfiche
- Aperture Cards
- Combination of the Above

ROLL FILM

- Methods of Index Coding
 - Flash card or flash target
 - Film pulldown or odometer
 - Image count or image control
 - Sequential numbering
 - Bar or line code
 - Photo-optical coding
- Retrieval Methods

MICROFICHE/COMPUTER OUTPUT ON MICROFILM (C.O.M.)

- Methods of Index Coding
 - Title/label and index
 - Column eyeball coding

ESTABLISHING A MICROFILM SYSTEM

SUMMARY

PART ONE

(cont'd)

- Color coding
- Notching, tabbing and magnetic coding
- Retrieval Methods

FILM CONSIDERATIONS

- Silver
- Diazo
- Vesicular
- Packing Density
- Film Quality

IN-HOUSE FILMING VS. A SERVICE BUREAU

MICROFILM SPECIFICATIONS & STANDARDS

PART TWO

TYPES OF CAMERAS AVAILABLE

- Planetary

ESTABLISHING A MICROFILM SYSTEM

SUMMARY

PART TWO

(cont'd)

- Method of filming
- Uses
- Features
- Equipment requirements
- Rotary
 - Method of filming
 - Uses
 - Features
 - Equipment requirements

CRITERIA NEEDED TO CHOOSE THE RIGHT CAMERA

PRE-FILMING PREPARATION OF DOCUMENTS

- Quality Control
- Document Preparation

CONTROLLING DOCUMENTS THROUGH THE FILMING PROCESS

- Importance of Controlling Documents
- Methods of Keeping Track of Documents

SUMMARY OF CRITERIA TO CONSIDER FOR MICROFILM PREPARATION AND CONTROL

MICROFILM FORMATS

ROLL FILM

APERTURE CARD

JACKET/FICHE

C.O.M.

STANDARD MICROFILM REDUCTIONS

<u>Type</u>	<u>Reduction</u>
Roll Film	24x, 42x, 48x
Microfiche	
16mm	24x, 42x, 48x
105mm (C.O.M.)	48x
Aperture Cards	16x, 24x, 30x (depends on size of document)

COMIC MODE

CINE MODE

DUPLEX

DUO

ROLL FILM--METHODS OF INDEXING

1. FLASH CARD OR FLASH TARGET

- Documents presorted, batched
- Target filmed 2-3 times on film
- Flash indexing on outside of box/cartridge
- Coding permanent part of film

2. FILM PULL-DOWN OR ODOMETER

- Documents presorted by file arrangement
- Odometer indexing on outside of box/cartridge gives approximate footage to document wanted
- Indexing based on linear location of images on film
- Reader must contain an odometer
- Accuracy within 10-20 frames

3. IMAGE COUNT OR IMAGE CONTROL

- No presorting
- Each page blip encoded
- Index indicates document location

ROLL FILM--METHODS OF INDEXING (cont'd)

- Reader must contain automatic keyboard & electronic circuitry which counts image marks

4. SEQUENTIAL NUMBERING

- Documents presorted
- Each page sequentially numbered
- Requires a supplementary index to identify the frame number assigned to a document
- Encoding becomes a permanent part of film

5. BAR OR LINE CODE

- Documents presorted
- Blackline exposed between documents as they are filmed
- Code line relates to frame batches
- Scale must be placed on reader to interpret the code lines
- Rotary camera only

6. PHOTO-OPTICAL CODING

- No presorting
- Descriptive data related to documents in photo-optical format placed on film

ROLL FILM--METHODS OF INDEXING (cont'd)

- Coding is placed beside document frame or along edge of film
- Coding is created by:
 - Keyboard associated with camera; or
 - Filming pre-coded index information simultaneously with the documents; or
 - C.O.M. with appropriate software
- Search conducted by keying in the codes

INDEXING ROLL FILM

FLASH CARD

FILM PULL-DOWN

IMAGE COUNT

BAR OR CODE LINE

PHOTO-OPTICAL CODE

CRITERIA TO CONSIDER FOR CHOOSING AN INDEXING METHOD
FOR YOUR ROLL-FILM SYSTEM

1. Packing density - reduction ratio.
2. Do you want coding a permanent part of the film?
3. How quickly will you require microfilm retrieval? Do you need a specific frame, or will getting into a "ballpark" suffice?
4. Do you want random filming, or do you want presorted filming?
5. Does the system have to be "updatable?"
6. Do you want a separate index to aid in using the film?
7. Will special equipment be required?
8. Will your system interface with a computer?

MICROFICHE--METHODS OF INDEXING

1. TITLE/LABEL AND INDEX

- Readable title at top of microfiche
- Index directs user to the row and column location desired

2. COLUMN EYEBALL CODING

- Readable title at top of microfiche
- Top of each column has a character(s) which designates the beginning parameter in that column
- Characters scanned until desired column is located
- Column is then scanned for correct frame

3. COLOR CODING

- Quick and easy to identify a batch or file of material
- Bands can be segmented with each segment a different color
- Can be used to separate sections of a file

4. NOTCHING, TABBING AND MAGNETIC CODING

- Used with automatic retrieval systems
- Microfiche either inserted in a plastic carrier that contains the coded information or the coding is made a part of the microfiche

MICROFICHE--METHODS OF INDEXING (cont'd)

- Microfiche then stored in interchangeable cassette or inside retrieval device

CRITERIA TO CONSIDER FOR CHOOSING AN INDEXING METHOD
FOR YOUR MICROFICHE SYSTEM

1. Packing density and reduction ratio.
2. Presorted filming is necessary.
3. Do you want the index to be part of the individual fiche contents?
4. How quickly will you require fiche retrieval?
5. Will system need to be "updatable?"
6. Will your system interface with a computer?
7. Will misfiled fiche cause a problem?
8. Will you want a "Step & Repeat" camera - or will jacket-stuffing/duping suffice?
9. Will just portions of your documentation be required at various locations, or all of it?

FILM CONSIDERATIONS

1. SILVER - Film coated with a silver halide emulsion. Original copy.

- Life Expectancy Over 500 Years - Archival Film
- Excellent Recording Densities
- Scratches Easily

2. DIAZO - Image is formed when exposed to blue or ultraviolet light. Developed by heated ammonia. Duplicate copy. Negative-negative.... Positive-positive.

- Life Expectancy 15-20 Years
- Doesn't Scratch Easily
- Excellent "Working Copy" Film

3. VESICULAR - Image is formed when exposed to ultraviolet light. Developed by heat only. Duplicate copy. Negative-positive.... Positive-negative.

- Life Expectancy 15-20 Years
- Doesn't Scratch Easily
- Excellent "Working Copy" Film

FILM CONSIDERATIONS (cont'd)

4. PACKING DENSITY - Length of Film x Thickness x Reduction Ratio = Packing Density.

Example:

100 ft X 5 Mil X 25x = ~2000 to 25,000 images

5. FILM QUALITY

- Density - The Opacity of the Non-Information Area of an Image.
 - Department of Defense (DOD) standard - 1.1 to 1.2 (densitometer)
- Resolution - Acuteness/Detail, Sharpness, Legibility of an Image.
 - Measured by lines per mm. Multiply reduction by target lines you can read.

CRITERIA FOR COMPARING IN-HOUSE FILMING VS. SERVICE BUREAU

1. Do you require close document control of record copies?
2. If only one record copy, would you require a copy made for security/protection while "record" is sent to a service bureau?
3. What would the "copy" costs be?
4. Do you have classified or company private documents that would have to be "escorted" through filming? (Special security arrangements must be made for classified documents.)
5. How would you transport documents to a service bureau?
6. What would your shipping/transportation costs be?
7. Would it require extra personnel for pick-up and delivery arrangements?
8. With accuracy of document preparation in mind, would you prepare the documents, or pay the service bureau to do that?
9. What turnaround time would be required?
10. Could both in-house and service bureau meet the turnaround schedule?
11. Would you need to hire additional staff for an in-house microfilm shop?
12. Who would train the personnel to properly operate and effectively run an in-house shop?
13. Would your company be able to invest the capital expenditures required to set-up a complete in-house shop, or would you buy just enough equipment to get by?

CRITERIA FOR COMPARING IN-HOUSE FILMING VS. SERVICE BUREAU (cont'd)

14. Would you have access to qualified in-house equipment maintenance personnel, or would you need vendor maintenance contracts?
15. Would any building modifications be necessary to house microfilm equipment?
16. Does your present building have adequate electrical service?
17. Will line voltage fluctuate during filming? (affects density)
18. Does your building have an adequate supply of hot and cold water to operate the processor?
19. Is there an existing drain-line system?
20. Is there adequate, controlled lighting available?
21. Does your facility have enough space to create a dark room for special handling of films?
22. Is there adequate air-conditioning, including humidity control, and air filtering for dust particles?
23. Is there space to house the raw stock film, chemicals, cartridges, etc.?

EQUIPMENT COSTS

CAMERAS

16mm Planetary	\$ 1,300 - 8,500
16mm Rotary	\$ 2,000 - 13,000
35mm Planetary	\$ 12,000 - 25,000
Fiche Step & Repeat	\$ 13,000 - 75,000

PROCESSORS

Silver Film	\$ 4,000 - 25,000
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DUPLICATORS

16/35 Roll-To-Roll, Diazo	\$ 7,000 - 10,000
16/35 Roll-To-Roll, Silver	\$ 5,000 - 10,000
Fiche To Fiche	\$ 1,500 - 25,000
Card To Card	\$ 1,500 - 50,000

READERS

Microfiche	\$ 110 - 550
Aperture Card	\$ 250 - 2,500
16mm Roll Film	\$ 325 - 7,500

READER/PRINTERS

Microfiche	\$ 1,000 - 4,500
Aperture Card	\$ 4,000 - 40,000
16mm Roll Film	\$ 2,000 - 12,000

MICROFILM SPECIFICATIONS AND STANDARDS

INDUSTRY STANDARDS

- National Micrographics Association
8728 Colesville, Road, Suite 1101
Silver Springs, Maryland 20910
- American National Standards Institute, Inc.
1430 Broadway
New York, New York 10018

FEDERAL SPECIFICATIONS

- Federal Specification and Standards Sales
Code 3FRSBS
General Services Administration Building 197
Washington Naval Yard
Washington, D.C. 20407

MILITARY SPECIFICATIONS

- Department of Defense Specifications and Standards
Commanding Officer
U.S. Naval Publications and Forms Center
5801 Taber Avenue
Philadelphia, Pennsylvania 19120

MICROFILM - THE SOLUTION TO:

- Reducing Bulk in Files
- Storage and Retrieval of Information
- Preservation of Records
- Distributing Information
- Rapid Accessibility

PLANETARY CAMERAS

- Films Material on a Flat Plane
- Versatility
 - Films bound documents
 - Films over-sized documents
- Uses 35mm and/or 16mm Film
 - Microfiche
 - Roll film
 - Aperture cards
- Various Sizes of Cameras
 - Range from 2 1/2 x 2 1/2 x 2 ft to about 9 x 8 1/2 ft
- Equipment Requirements
 - Constant temperature may be required
 - Darkened room may be required during loading, unloading & resetting

ROTARY CAMERAS

- Automatic or Manual Feed Mechanism
- Films Documents up to 11 in. in Width
- Uses 16mm Film
 - Microfiche
 - Roll film
- Other Available Features
 - Automatic Sequential Numbering
 - Blip Coding
 - Imprinter
- Equipment Requirements
 - Special document preparation
 - Camera itself needs no special lighting
 - Maintenance considerations--worn belts, machine jams

THE NECESSARY CRITERIA FOR CHOOSING THE TYPE OF CAMERA TO FIT YOUR NEEDS

1. What type of documents will be filmed?
2. What size of documents will be filmed?
3. What form do you want for your microfilm?
 - Microfiche?
 - Roll Film?
 - Aperture Cards?
4. What quantity of documents do you have to film?
5. What production rate will suit your needs?
6. What quality of image do you need?
7. How much renovation will be necessary for the type of camera you want?
8. Would you have a computer retrieval system and if so, what special features would you need?
9. What special features would you like to have?
10. How much time, effort and personnel are you willing to put into pre-filming preparation?
11. What maintenance costs can you expect?
12. What are the costs of the equipment, materials, etc?

WORKSHEET PLANETARY VS. ROTARY

	PLANETARY		ROTARY
	35mm	16mm	16mm
1. TYPE OF DOCUMENTATION TO BE FILMED			
Bound Documents	_____	_____	_____
8 1/2" x 11"	_____	_____	_____
Oversized	_____	_____	_____
Odd sizes	_____	_____	_____
Other	_____	_____	_____
2. VOLUME OF DOCUMENTATION TO BE FILMED			
Large	_____	_____	_____
Small	_____	_____	_____
3. FILMING TURN-AROUND TIME	_____	_____	_____
4. FEATURES NEEDED OR DESIRED			
Blip Coding	_____	_____	_____
Imprinter	_____	_____	_____
Other	_____	_____	_____
5. TYPE OF MICROFILM			
Microfiche	_____	_____	_____
Roll Film	_____	_____	_____
Aperture Cards	_____	_____	_____
6. TYPE OF INDEXING			
Flash Card or Flash Target	_____	_____	_____
Film Pull-Down or Odometer	_____	_____	_____
Image Count or Image Control	_____	_____	_____
Sequential Numbering	_____	_____	_____
Bar or Line Code	_____	_____	_____
Photo-Optical Coding	_____	_____	_____
Title/Label and Index	_____	_____	_____
Column Eyeball Coding	_____	_____	_____
Color Coding	_____	_____	_____
Notching, Tabbing and Magnetic Coding	_____	_____	_____
7. TYPE OF FILM USED			
16mm	_____	_____	_____
35mm	_____	_____	_____
8. PRE-FILMING PREPARATION TIME ALLOWANCE	_____	_____	_____

PRE-FILMING PREPARATION

1. Check for the quality of the documents.
2. Check to see that the document is complete and in the right order.
3. Check for copyrighted material.
4. Necessary items to flag:
 - Start and End of a Document
 - Backups
5. Preparation Details
 - Remove Staples and Paper Clips
 - Trim Frayed or Torn Edges
 - Tape Holes or Tears
 - Replace Tissue or Onion Skin Paper with Photocopies
 - Disassemble Bound Documents

CONTROLLING DOCUMENTATION DURING THE MICROFILMING PROCESS

Control of Documents

- Aids in the Inventory of Hard Copy
- Aids in the Retrieval of Documents During the Filming Process
- Is a Means of Quality Control

Suggested Method of Keeping Track of Documents

- Reel Number Placed on Box and On Each Page of the Documents in the Box.
- Traveler (stays with the box) and Load Card (placed in the load board) Contain Information Such as:
 - Microfilm reel number
 - Log-in and log-out times
 - Initials of each person handling the box
 - Contents of the box (beginning and end document number or subject)
 - Special instructions
 - Priority
- Index Sheet (list of box's contents)

FLOW OF HARDCOPY THROUGH MICROFILM PREPARATION AND CONTROL

☐ DATA PACKAGE ☒ CORRESPONDENCE ☒ RELEASED ☐ UNRELEASED ☒ CURRENT ☐ HISTORICAL ☐		T Y P E	PRIORITY # 1		NO. IMAGES _____ ORDERED BY <u>J. Isaacs</u>		ORDER/REEL NO. <u>78-04316</u> DATE PREP'D <u>5-18-78</u>	
C A T E G O R Y			MICROFILM ROLL ☒ SILVER ☐ DIAZO MICROFILM CARTRIDGE ☐ SILVER ☒ DIAZO MICROFICHE ☐ SILVER ☐ DIAZO		Daily Correspondence			
SPECIAL INSTRUCTIONS		<u>After Filming Send to Dalis</u>						

OP. NO.	OPERATION	START			FINISH		
		TIME	DATE	INITIAL	TIME	DATE	INITIAL
10	MICROFILM PREPARATION	8:00	5/18/78	L.S.	9:25	5/18/78	L.S.
20	MICROFILMING						
30	DUP/Q.C.						
40	DALIS						

START DOCUMENT NUMBER OR TITLE Index: Daily Correspondence
 END DOCUMENT NUMBER OR TITLE C.C. - 78-90437

MICROFILM DISTRIBUTED: RECORDS MGMT ☐ DALIS ☐ CENTRAL FILES ☐
 SATELLITE FILES ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ 9

MICROFICHE DISTRIBUTED: REQUESTOR _____
 DISTRIBUTED BY _____ DATE _____

BOX RECEIVED AT CENTRAL FILES _____ DATE _____

WHITE - TRAVELER COPY YELLOW - MICROFILM DELIVERY COPY PINK - MICROFILM ORDER COPY GOLDENROD-WIP FILE COPY

LOAD CARD

1		5-18-78				78-04316
PRIORITY	MF PREP	ARHCO	DALIS	CENTRAL FILES	ORDER NO.	
☐ DATA PACKAGE ☒ CORRESPONDENCE		☒ RELEASED ☐ UNRELEASED		☒ CURRENT ☐ HISTORICAL ☐		Daily Correct
DOCUMENT TYPE		DOCUMENT CATEGORY				DATE PREP'D
ASSIGNED TO (NAME)		Lucille Sella				
BO-7600-320(11-76)

HEDL 7809-126.68

1. 78-04316

DATE: May 18, 1978 Daily Correspondence

DOCUMENT NO.	DOCUMENT NO.	DOCUMENT NO.
1. Index: Daily Corres	19. CA-78-08364	37. PL-78-99346
2. VM-78-19000	20. TD-78-34300	38. KI-78-99340
3. VM-78-19001	21. TD-78-34301	39. WR-78-99352
4. VM-78-19002	22. TD-78-34302	40. BC-78-99320
5. VM-78-19003	23. TD-78-34303	41. PR-78-99350
6. VM-78-37006	24. AP-78-90368	42. EL-78-99330
7. VM-78-37007	25. AP-78-80021	43. KE-78-99336
8. VM-78-37008	26. AP-78-80022	44. DC-78-93633
9. FM-78-03601	27. AP-78-60032	45. CC-78-90481

HEDL 7809-126.69

SUMMARY OF CRITERIA TO CONSIDER FOR MICROFILM PREPARATION AND CONTROL

1. How much time and manpower will be devoted to document preparation?
 - How would you deal with the tediousness of this job?
 - How would you make the job challenging?
2. What will be your quality acceptance level?
3. What will you do with poor quality originals?
4. What will you do with the hard copy after microfilming?
5. Will you provide individual microfilming service e.g., engineers' files, president's files?
6. How will you keep track of what is or is not being filmed?
7. How will you find a document while it is in the various stages of being microfilmed?
8. What type of quality control will you have on your microfilm reels?
 - What will be considered acceptable and what won't be?

*APERTURE CARD
PRODUCTION*

APERTURE CARD PRODUCTION

SUMMARY

PART ONE

MICROFILMING OF ENGINEERING DRAWINGS

VALUE OF DRAWINGS

IMPACT OF DRAWINGS ON PRODUCTION

COMPARISON OF APERTURE CARDS TO FULL-SIZE BLUELINE PRINTS

- Advantages of Producing Drawings from Aperture Cards
- Cost Savings
- Security

ESTABLISHING IN-HOUSE MICROFILMING CAPABILITIES

- Quality of Drawings
- Length of Program
- Volume of Work
- Geographic Location
- Security
- Work Flow
- Equipment Selection
- Equipment Procurement

APERTURE CARD PRODUCTION

SUMMARY

(cont'd)

PART TWO

FACTORS TO CONSIDER WHEN PROCURING EQUIPMENT

ANALYSIS OF SPECIFIC NEEDS

GENERAL REQUIREMENTS FOR ALL EQUIPMENT

- Manufacturer
- Space Requirements
- Ease of Operation
- Adaptability

CAMERA REQUIREMENTS

- Film Length
- Automatic Warnings
- Optics
- Backlighting

FILM PROCESSORS

- Automatic or Manual Feed
- Temperature Controls
- Water Filters
- Processing Rate
- Chemistry Availability

APERTURE CARD PRODUCTION

SUMMARY

PART TWO

(cont'd)

TYPES OF FILM

- Silver
- Diazo
- Buying in Bulk
- Density Requirements

APERTURE CARD EQUIPMENT, FILM DUPLICATORS & READERS

- Automatic Film to Card Machines
- Keypunching Machines
- Roll to Roll Duplicators
- Card to Card Duplicators
- Readers and Reader/Printers
- Production Printers

AUTOMATIC RETRIEVAL SYSTEMS

PART THREE

DESIGNING A WORKFLOW FOR ENGINEERING DRAWINGS AND APERTURE CARD PRODUCTION

ENGINEERING DRAWINGS WORKFLOW

- Initiation
- Control
- Responsibility
- Control Points

APERTURE CARD PRODUCTION

SUMMARY

PART THREE

(cont'd)

- Size and Type of Prints
- Distribution
- Interfaces Required

APERTURE CARD PRODUCTION WORKFLOW

- Receipt of Drawing
- Required Forms
- Processing and Control of Drawings
- Drawing Status Register
- Keypunching

VALUE OF DRAWINGS

Value of Drawing Not Always Related To Age Or Activity

TOTAL COST OF DRAWING

- Engineering Time
- Drawing Preparation Time
- Administrative/Clerical Time
- Cost of Drawing

IMPACT OF DRAWINGS ON PROFIT

- Used as a Communications Device
- Drawing Changes and/or Revisions
- Production
- Obsolete Revision Level
- Delay Factor

ADVANTAGES OF APERTURE CARDS

1. GREATER CAPABILITIES AND FLEXIBILITY

- Establishment of satellite aperture card files at points of high use
- Easy reproduction
- Faster service to the customer

2. COST SAVINGS

- Reduced filing space
- More economical print production from aperture cards (vs. blue-line)
- Less waiting time for users
- Aperture cards can be duplicated easily and inexpensively
- Peak loads for prints of same drawing can be met easily
- Original drawing remains in file longer - access for revisions, fullsize prints, etc.
- Lower mailing costs
- Reduced wear on original drawings - less redraw

3. SECURITY

- Film may be used as "record" copy

ADVANTAGES OF APERTURE CARDS (cont'd)

- History of drawing maintained through all revisions
- Aperture card will provide backup if original is damaged or destroyed
- Security film copy can be filed at separate location

CRITERIA TO CONSIDER IN DETERMINING IN-HOUSE MICROFILMING CAPABILITIES

1. QUALITY OF DRAWINGS

- Drafting Standards
 - Line weights
 - Lettering size
- Materials Used
 - Mylar
 - Plastic lead, ink, etc.

2. LENGTH OF PROGRAM

- Does length of program justify in-house capabilities?
- Could a service bureau be utilized?
- Determine the time required to establish program vs. project needs.

3. ESTIMATED VOLUME OF WORK

- What is the volume of drawings that need to be filmed?
- What size prints will be required?
- How many copies will be needed (average)?
- What is the frequency of use?
- What is the estimate number of drawing revisions expected?
- What schedules of turnaround time are expected?

CRITERIA TO CONSIDER IN DETERMINING
IN-HOUSE MICROFILMING CAPABILITIES (cont'd)

4. GEOGRAPHIC LOCATION

- In relationship to project.
- In relationship to service bureau (if considered).
- Where are users located?
- Will transportation be a problem in maintaining schedules?

5. SECURITY

- May preclude use of service bureau.
- Protection of drawings from loss and damage.

6. WORKFLOW

- Organizational structure is required.
- Determine what work space will be required.
- Determine what staff capabilities will be required (keypunch, camera operator, film processor, supervision, etc.).
- Determine the availability of staff.
- What training is required of staff?
 - By equipment vendor?
 - In-house?

CRITERIA TO CONSIDER IN DETERMINING
IN-HOUSE MICROFILMING CAPABILITIES (cont'd)

- What interface with other organizations will be required?
- What tracking methods will be used to insure integrity of system?

7. EQUIPMENT SELECTION

- Determine the size of drawings to be filmed.
- Will aperture cards be keypunched?
- What type of retrieval equipment will be required?
- Will the capability of duplicating aperture cards be required?
- What supporting and/or miscellaneous equipment will be required?
- How much space will be required to house equipment and store supplies?
- What special electrical and plumbing will be required?

8. EQUIPMENT PROCUREMENT

- Make detailed specifications based on your requirements and available funds.
- Investigate thoroughly the equipment's capabilities.
- Does the availability and/or delivery time meet your schedule?
- Investigate installation time and costs.

CRITERIA TO CONSIDER IN DETERMINING IN-HOUSE
MICROFILMING CAPABILITIES (cont'd)

- What type of maintenance will be required and is this service readily available?

CRITERIA TO CONSIDER WHEN PROCURING EQUIPMENT

1. MANUFACTURER

- Have other firms purchased the same equipment that you are considering?
- What is the maintenance guarantee?
 - Will the manufacturer, the vendor, or the customer maintain the equipment?
 - How fast can service personnel respond?
 - Preventative maintenance
- Will the manufacturer lease the equipment?
 - Will the project be short term?
 - Does the workload justify leasing?
 - Is the equipment likely to be outdated soon?

2. SPACE REQUIREMENTS

- Floor space
 - All phases of production such as filming, processing, card mounting, office space, duplicating, filing, etc., should be analyzed. Space allowances for a good workflow and possible expansion needs should be made.
- Will you need a darkroom for the type of equipment being considered?
- Ventilation is required for most processors that use ammonia or other harsh chemicals.

CRITERIA TO CONSIDER WHEN PROCURING EQUIPMENT. (cont'd)

- Will you need separate electrical lines for high power equipment?
 - Make sure all equipment manufactured abroad has been converted to U S. voltage.
- What are the plumbing requirements for the equipment being considered?
 - Temperature and pressure controls are needed on film processing equipment

3. EASE OF OPERATION

- Does the equipment need a technician to operate it or can a clerk be utilized?

4. ADAPTABILITY

- Can the equipment be adapted to your system (e.g. modular designs)?

WHAT ARE YOUR CAMERA REQUIREMENTS

- Size of Drawings
- Workload
- Automatic Warnings
- Optics
- Backlighting

WHAT ARE YOUR FILM PROCESSING REQUIREMENTS

- Type of Feed
- Temperature Controls
- Water Filters
- Processing Rate
- Chemistry Availability

FILM CONSIDERATIONS

- Silver
- Diazo
- Bulk Buying and Storage
- Density Requirements

APERTURE CARD EQUIPMENT AND FILM DUPLICATORS

- Automatic Film to Card Machines
- Keypunching
- Roll to Roll Duplicators
- Card to Card Duplicators

READERS AND READER/PRINTERS

READERS

- Screen Size
- Magnification

READER/PRINTERS

- Type of Process
- Paper Size
- Exposure Control

PRODUCTION PRINTERS

- High Volume Capability
- Computer Assisted

CRITERIA TO CONSIDER FOR AUTOMATED STORAGE/RETRIEVAL SYSTEMS

1. Is the equipment modular in design?
2. What type of microfilm will be used? Aperture card, fiche or roll film?
3. Will it be computer controlled? What functions will the computer provide? Will it give you computer printouts?
4. Does it have remote video?
5. What is the storage capability?
6. What is the speed of search?
7. Do you need a printer attached to the system? If not, can you add one later?
8. Do you have the room climate controlled to provide for longer shelf life of film?
9. Will the vendor install the system? Will it cost extra?
10. Who will provide the service contract?
11. Do you need a preventative maintenance procedure for the equipment?

REPRODUCTION EQUIPMENT CONSIDERATIONS

1. What is your estimated workload?
2. Do you need blueline and sepia reproduction?
3. Do you need halfsize or full-size drawing capabilities, or both?
4. How fast can the equipment produce?
5. Do you have sufficient workload to justify an automatic folder?
6. Do you have the proper ventilation for the ammonia fumes?

CAMERA WORKSHEET

Manufacturer	_____	_____	_____	_____
Model	_____	_____	_____	_____
Date Introduced	_____	_____	_____	_____
Type				
Planetary	_____	_____	_____	_____
Rotary/Flow	_____	_____	_____	_____
Step-And-Repeat	_____	_____	_____	_____
Film Width	_____	_____	_____	_____
Film Length	_____	_____	_____	_____
Footage Indicator	_____	_____	_____	_____
Maximum Frame Size	_____	_____	_____	_____
Variable	_____	_____	_____	_____
Maximum Copy Size	_____	_____	_____	_____
Reduction	_____	_____	_____	_____
Lens	_____	_____	_____	_____
Exposure Rate	_____	_____	_____	_____
Counter	_____	_____	_____	_____
Illumination Control				
Continuous	_____	_____	_____	_____
Steps	_____	_____	_____	_____
Light Meter	_____	_____	_____	_____
Power Requirements	_____	_____	_____	_____
Automatic Warnings				
Improper Threading	_____	_____	_____	_____
Film End	_____	_____	_____	_____
Light Failure	_____	_____	_____	_____
Dimensions				
Height	_____	_____	_____	_____
Depth	_____	_____	_____	_____
Width	_____	_____	_____	_____
Weight	_____	_____	_____	_____
Accessories	_____	_____	_____	_____
Special Features	_____	_____	_____	_____
Price	_____	_____	_____	_____

FILM PROCESSOR WORKSHEET

Manufacturer	_____	_____	_____	_____
Model	_____	_____	_____	_____
Date Introduced	_____	_____	_____	_____
Type				
Continuous	_____	_____	_____	_____
Rewind	_____	_____	_____	_____
Reel & Tank	_____	_____	_____	_____
Spiral Reel	_____	_____	_____	_____
Film Width	_____	_____	_____	_____
Film Length	_____	_____	_____	_____
Speed (ft/hr)	_____	_____	_____	_____
Thermostat	_____	_____	_____	_____
Tank Capacity	_____	_____	_____	_____
Power Requirements	_____	_____	_____	_____
Plumbing Requirements	_____	_____	_____	_____
Dimensions				
Height	_____	_____	_____	_____
Depth	_____	_____	_____	_____
Width	_____	_____	_____	_____
Weight	_____	_____	_____	_____
Accessories	_____	_____	_____	_____
Special Features	_____	_____	_____	_____
Price	_____	_____	_____	_____

READERS/PRINTERS WORKSHEET

Manufacturer	_____	_____	_____	_____
Model	_____	_____	_____	_____
Date Introduced	_____	_____	_____	_____
Type				
Continuous	_____	_____	_____	_____
Steps	_____	_____	_____	_____
Speed (FT/Hr)				
Variable	_____	_____	_____	_____
Film Width	_____	_____	_____	_____
Film Length	_____	_____	_____	_____
Unitized Cards	_____	_____	_____	_____
Fiche	_____	_____	_____	_____
Magnification				
Continuous	_____	_____	_____	_____
Steps	_____	_____	_____	_____
Screen Size	_____	_____	_____	_____
Maximum Size of Enlargement	_____	_____	_____	_____
Type of Printout				
Opaque	_____	_____	_____	_____
Translucent	_____	_____	_____	_____
Offset Plate	_____	_____	_____	_____
Type of Process				
Photographic	_____	_____	_____	_____
Electrostatic	_____	_____	_____	_____
Electrolytic	_____	_____	_____	_____
Lens				
Focus Manual	_____	_____	_____	_____
Focus Automatic	_____	_____	_____	_____
Power Requirements	_____	_____	_____	_____
Dimensions				
Height	_____	_____	_____	_____
Depth	_____	_____	_____	_____
Width	_____	_____	_____	_____
Accessories	_____	_____	_____	_____
Special Features	_____	_____	_____	_____
Price	_____	_____	_____	_____

TYPICAL DOCUMENT FLOW

CRITERIA TO CONSIDER IN DEVELOPING A DRAWING WORKFLOW

1. Who will initiate new and/or revised drawings?
2. Who will control the review and sign-off cycle?
3. Who will be responsible for the drawing original?
4. What control points will be required?
5. Will a drawing register be required to track drawing's status?
6. What size and type of prints will be required?
7. How will distribution of prints be made?
8. What interfaces between groups are required?

CRITERIA TO CONSIDER IN DEVELOPING A WORKFLOW FOR
APERTURE CARD PRODUCTION

1. How will the drawing be received and tracked through the process cycle?

- Forms
 - What information is required?
 - How will the form be utilized?
 - Is design of the form important?

2. What is the best way to process drawings and control work flow?

- How many drawings per package?
- Should drawings be sorted by size?
- How many drawings per roll of film?
- What quality control points are required and where?

3. What advantages will a drawing status register provide?

- Will it be used by other groups?
- What information will it contain?
- What type of register will fill your needs?
 - Manual
 - Computer printout
 - On-line computer via CRT
 - Who will make entries and how will they be made?

CRITERIA TO CONSIDER IN DEVELOPING A WORKFLOW FOR APERTURE
CARD PRODUCTION (cont'd)

4. What are the advantages of keypunching aperture cards?
- Faster than typing
 - "Slave" card made for high production of identical cards
 - Easy to read
 - "Slave" cards can be put onto computer to provide printout if needed
 - What information is needed on the aperture card?

KEYWORDING

KEYWORDING

SUMMARY

WHY ASSIGN KEYWORDS?

WHAT IS A KEYWORD?

BASIC RULES OF KEYWORDING

TOOLS USED IN KEYWORDING

- Keyword Thesaurus
- Document Type List
- Company Abbreviations List
- Acronyms List

ORGANIZING A KEYWORDING GROUP

- Establishing a Purpose & Scope
- Types of Documentation
- Determining Data Fields
- Necessary Procedures
- Staff Requirements
- Staff Evaluation

THE PURPOSE OF ASSIGNING KEYWORDS

- Provides Indexes for Searching
- Retrieves
 - By subject
 - By terms familiar to the searcher
 - Quickly

WHAT IS A KEYWORD?

- A Word or Phrase
- Describes the Essence of a Document
- Permits Retrieval by Subject

BASIC RULES OF KEYWORDING

- Be Specific
- Use Generic Terms
- Be Consistent
- Be Thorough
- Avoid Vague Terms

QUESTIONS TO BE ASKED WHEN ASSIGNING KEYWORDS

- Will this document be needed in the future?
- What are the significant points in this document?
- What is this document really all about?
- What is important in this drawing?
- What in this document may be important to retrieve in the future?
- What are the specific terms?
- What are the generic terms?
- Is anyone ever going to ask for everything on this keyword?
- If anyone is asking for everything on a certain keyword, would he want this document?

ORGANIZING A KEYWORDING GROUP

- Establish and Determine
 - Purpose and Scope
 - Documentation
 - Data Fields
 - Procedures
- Hire Staff
- Implement Training Program
- Begin Keywording
- Staff Evaluation

DOCUMENTATION
AND
LOCATION
IDENTIFICATION
SYSTEM

DATA INPUT SHEET

SAME AS FIELD 12
FILM IDENTIFICATION NUMBER

FIELD NO.	DESCRIPTOR	DATA
1	DOCUMENT NUMBER	ALPHA NUMERIC RULE
2	SHEET NUMBER	ALPHA NUMERIC RULE
3	REVISION	ALPHA NUMERIC RULE
4	DATE	YYMMDD (no dashes, slashes, or spaces)
5	TITLE	EXACTLY AS IT APPEARS ON DOCUMENT EXCEPT FOR CHARACTERS
	THE COMPUTER WON'T TAKE, I.E., () / : ; # = ' " @ ! > <	
	USE [] IN PLACE OF ()	
6	ORIGINATOR (CORP.)	AS IT APPEARS IN THESAURUS
7	RECEIVER (CORP.)	AS IT APPEARS IN THESAURUS
8	SYSTEM	ALPHA NUMERIC RULE
9	CROSS REFERENCE	ALPHA NUMERIC RULE
10	SPECIFICATION	ALPHA NUMERIC RULE
11	DOCUMENT TYPE	AS IT APPEARS IN THESAURUS
12	LOCATION	ALL NUMERIC EXCEPT FOR SPECIAL LOCATIONS
13	HARDWARE NUMBER	ALPHA NUMERIC RULE
14	ITEM SERIAL NUMBER	ALPHA NUMERIC RULE
15	BUILDING NUMBER	ALPHA NUMERIC RULE
16	AFFECTED DOCUMENTS	ALPHA NUMERIC RULE
17	REFERENCES	ALPHA NUMERIC RULE EXCEPT WHEN LISTING TITLES OF DOCUMENTS
18	HANFORD INDEX NUMBER	ALPHA NUMERIC RULE
19	VENDOR PART NUMBER	ALPHA NUMERIC RULE
20	VENDOR DRAWING NUMBER	ALPHA NUMERIC RULE
21	VENDOR DRAWING TITLE	ALPHA NUMERIC RULE
22	NEXT USED ON	
23		
24	KEY WORDS	SEPARATE WORDS OR GROUPS OF WORDS BY COMMAS. TREAT NUMBERS
	LIKE WORDS, I.E., LOOP 1, LOOP 2, PUMPS, VALVES, COLD LEG CHECK VALVES	
	ALPHA NUMERIC RULE - ALPHA FOLLOWED BY ALPHA, ELIMINATE SPACES, DASHES ETC.	
	ANL2457845. ALPHA FOLLOWED BY NUMERIC OR NUMERIC FOLLOWED BY ALPHA, ELIMINATE	
	SPACES, DASHES, ETC. HWS1102 215AC. NUMERIC FOLLOWED BY NUMERIC, USE DASHES WHERE	

80-7400-057 (3-78)

RIOS: NR, DESTROY AFTER INPUT/VERIFICATION
ON THE OALIS DATA BASE.

PROJECT DALIS
MAY 1977

DALIS CHANGE SHEET

Film Ident. No.	Field Name	As Is	Change To
A-7600-373 (6-77)

AUTHORITY FILE CHANGES

Authority file to be changed

 Company Names

Doctypes

Thesaurus

Originated

By Analyst

Date _____

Entered in Authority File

By

Date _____

[illegible]

TYPICAL KEYWORDING PROCEDURE

1. Procedure - Design Documents other than Drawings.

1.1 Keyword Analyst

1.1.1 Obtain and take to work station a box of hardcopy documents or a microfilm reel or any other documentation as required by supervisor.

1.1.2 Take log book and find the reel number in the log as entered on the traveler, box, or microfilm reel.

a. If no previous entry has been made for the reel/box about to be processed, enter current date and initials.

b. If an entry has been made (indicating the reel/box has been previously processed), report entry to supervisor for corrective action and assignment of another box for processing.

1.1.3 In the case of hardcopy processing, select at random two documents from the box. Place microfilm reel in reader and verify that the documents are on that reel (Frame number printed on a document should coincide with the microfilm image

TYPICAL KEYWORDING PROCEDURE (cont'd)

document at that same frame location).

- a. If document/reel image do not match, inform supervisor for corrective action.

STATISTICS FOR DETERMINING STAFF REQUIREMENTS

No. of Documents keyworded in past 12 months	10,379
No. of analysts (average through year)	11
Average no. documents/person/day (keywording time only)	60
Average no. documents/person/day (including other tasks and absences)	36
Time required for analyst to become productive	3-6 months
Work space required	80 ft ² /person (including equipment)

CRITERIA TO BE CONSIDERED WHEN
ESTABLISHING JOB REQUIREMENTS FOR ANALYSIS

1. At least 2 weeks training on keywording fundamentals and information about the documentation.
2. Learn thoroughly the alpha numeric rule.
3. Analyze the documentation that is to be included in the data base.
4. Qualify and select significant information (words/phrases) peculiar to the documents. Fill in proper fields on data sheets or computer terminal.
5. Update data base with new information and/or modifications and corrections as needed.
6. Consult with originators for correct interpretation of the contents of documents when necessary to assure adequate and accurate input information.
7. Provide input to authority files, Thesaurus, procedures, and keywording guidelines.
8. Keep abreast of all changes - refer to guidelines to keep one's work consistent with other analysts.
9. Consult reference materials. Add to file.
10. Perform any special duties as assigned by supervisor.
11. Learn to use a computer terminal. Learn to do indepth retrieval searches via the terminal and develop search strategies that will

CRITERIA TO BE CONSIDERED WHEN ESTABLISHING JOB REQUIREMENTS
FOR ANALYSTS (cont'd)

produce the required information. Be able to complete a series of searches as devised by supervisor.

12. Be consistent in keywording.
13. Increase knowledge and understanding of company documentation.
14. Write reports as required by supervisor.

TYPICAL ANALYST TRAINING PROCEDURE

1. Introduction & Orientation

- a. Tour of work area and introduction to key people outside of own group.
- b. Emergency Procedures

2. Study Program

_____ Company History

_____ Safety Reports

_____ Operation Manuals

_____ Any other reading material that would provide background knowledge.

- (Some of the reading could be required initially while other reading could be done in the future.)

3. Document Retrieval Program

_____ Learn to use a computer terminal

_____ Learn to use more advanced programs

_____ Practice search questions

4. Reference Library Orientation

_____ (A list of reference tools that analyst will need to learn.)

TYPICAL ANALYST TRAINING PROCEDURE (cont'd)

5. Tour of related facilities.
6. Review of completed data sheets and sample document file.
7. Indexing & keywording of documents under direct supervision.
8. Evaluation by supervisor.
9. Individual indexing & keywording.

*COMPUTERIZING THE
DOCUMENT
RETRIEVAL SYSTEM*

COMPUTERIZING THE DOCUMENT RETRIEVAL SYSTEM

SUMMARY

PRE-SYSTEM PLANNING

- Organize a Project Team
- Establish System Objectives
 - Determine Purpose of System
 - Determine the Kind of System Needed
 - Determine the User Community
 - Determine Commitments & Constraints

SPECIFYING A SYSTEM

- Establish User Needs
- Translate User Needs to System Specifications
- Prepare a Proposal Request

SYSTEM SELECTION

- System House vs. Computer Manufacturer
- Evaluation of Vendor Proposals
- Vendor Site Demonstration
- Operating Environment

COMPUTERIZING THE DOCUMENT RETRIEVAL SYSTEM

SUMMARY (cont'd)

INSTALLATION PLANNING

- Facilities
- Staffing Requirements
- Training

SYSTEM INSTALLATION

- Customer Responsibilities
- Vendor Responsibilities
- Acceptance Testing

SYSTEM STARTUP

- Data Entry/Verification
- Controlling the Paper Flow
- Loading the Data Base
- Computer Problems - What to do when the computer stops
 - Backup for Data & Equipment
 - User Diagnostics

SYSTEM PLANNING

RESPONSIBILITIES OF THE PROJECT TEAM

- Define System Objectives
- Develop System Specifications
- Select Equipment
- Plan and Schedule System Acquisition
- Install System and Perform Checkout Procedures

PROJECT TEAM

PROJECT TEAM MEMBER RESPONSIBILITIES

PROJECT MANAGER

- Team Selection
- Coordinate Team Activities
- Management Interface
- Assure Project Goals Are Met

DATA BASE ADMINISTRATOR

- Controls What, When and How Information is Inputed into the Data Base
- Responsible for Accuracy of Data Base
- Principal Interface Between the System and the Users
- Defines Procedures for Entry and Verification of Data

USE A CONSULTANT

- When there is lack of in-house expertise
- When there is a need for an impartial analysis of requirements
- When there is a need for assistance in system design and implementation

HOW TO USE A CONSULTANT

- Determine what kind of expertise is needed
- Define specific tasks and work schedules
- Establish interfaces with prospective user groups
- Monitor performance against schedules

ESTABLISHING OVERALL SYSTEM OBJECTIVES

1. ESTABLISH PURPOSE

- State the Function
- Determine Schedules
 - Equipment selection
 - Application program development
 - Installation and checkout
 - Acceptance testing
 - Loading the system
- Establish the Benefits
 - Reduction in operating cost
 - Improved access to data
 - Increased capabilities (microfilm retrieval, special reports)
 - Management information (status reports, tracking information)

2. IDENTIFY PROJECTED USER COMMUNITY

3. DETERMINE GENERAL CAPABILITIES NEEDED

- Retrieval Needs
- Data Entry Requirements
- Number of Data Bases
- User vs. Operator-Oriented System

ESTABLISHING OVERALL SYSTEM OBJECTIVES (cont'd)

4. EVALUATE PROJECT COMMITMENTS AND CONSTRAINTS

- Funding Limitations
- Schedule for Acquisition and Startup
- Personnel Requirements
- Equipment Availability
- Use of Existing Equipment
- Secondary Applications

5. DEFINE DOCUMENTATION REQUIREMENTS

- User Requirements
- Project Plan and Schedule
- System Specifications
- Vendor Documentation
- Facility Requirements
- Operating Plan

SPECIFYING A SYSTEM

1. ESTABLISH USER NEEDS

- Volume of Data
- Data Entry Capabilities
- Data Retrieval Capabilities
- Special Needs
 - Microfilm retrieval
 - Computational capabilities
 - Interface to other computer system
- Reporting Capabilities

2. TRANSLATE USER NEEDS INTO SYSTEM SPECIFICATIONS

- Performance Requirements
 - Data entry
 - Information retrieval
 - Other applications
 - computational requirements
 - interface with other data bases
 - microfilm system interface
 - Terminal requirements
 - System availability

SPECIFYING A SYSTEM (cont'd)

- redundancy requirements
 - user diagnostics/system degradation
 - error recovery
 - maintenance
 - operating requirements (maintenance, archiving, etc.)
-
- Specifying Equipment and Software
 - Type of system
 - Data storage requirements
 - Printing capabilities
 - Terminal needs
 - Computer system
-
- software
 - equipment configuration
 - benchmark/acceptance testing
 - user training
 - documentation requirements
 - system installation and checkout
 - maintenance

USER REQUIREMENTS WORKSHEET

	User Organization			
	A	B	C	D
A. Data Base				
1. Number of Records				
a. on-hand				
b. total				
2. Type of Data Input				
a. on-line				
b. batch				
3. Average Record Size (characters)				
4. Number of Fields Per Record				
5. Number of Searchable Fields Per Record				
B. System Performance				
1. Records Input Per Day				
2. Searches Per Day				
3. System Usage (Hours Per Day)				
C. Terminal Requirements				
1. Data Entry				
a. type*				
b. number				
2. Retrieval Station				
a. type				
b. number				
3. User Terminals				
a. type				
b. number				
4. System Operation				
a. type				
b. number				
D. Report Requirements				
1. Frequency				
2. Items Per Report				
3. Fields Per Report				
E. Communication Lines				
1. Type**				
2. Number				

* CRT, CRT with printer, hardcopy (teletype)

**Hardwired, Dialup Telephone Line, Dedicated Telephone Line

CONTENTS OF A REQUEST FOR PROPOSAL

- Description of Application
- Performance Requirements
- Equipment and Software Specifications
- Acceptance Testing
- Maintenance
- Documentation
- Special Requirements (e.g., Delivery)

SYSTEM SELECTION

- System House vs. Computer Manufacturer
- Evaluating Vendor Proposals
- System Demonstration
- Operating Environment

INSTALLATION PLANNING

- Facilities
- Staffing Requirements
- Training

SYSTEM OPERATIONS GROUP

INSTALLATION PLANNING WORKSHEET

	Space sq ft	Electrical Volts Amps	Heat Load Btu
A. Computer Room			
Computer	_____	_____	_____
Disk Storage	_____	_____	_____
Terminals	_____	_____	_____
Storage	_____	_____	_____
Air Conditioning	_____	_____	_____
Communication Equipment	_____	_____	_____
Personnel	_____	_____	_____
Furniture	_____	_____	_____
B. Retrieval Station			
Equipment	_____	_____	_____
Furniture	_____	_____	_____
Storage	_____	_____	_____
Communication Equipment	_____	_____	_____
Personnel	_____	_____	_____
C. Data Entry			
Equipment	_____	_____	_____
Furniture	_____	_____	_____
Storage	_____	_____	_____
Communication Equipment	_____	_____	_____
Personnel	_____	_____	_____
D. Operations Staff			
Equipment	_____	_____	_____
Furniture	_____	_____	_____
Communication Equipment	_____	_____	_____
Personnel	_____	_____	_____

COMPUTER ROOM - 3706 BUILDING

INSTALLING THE SYSTEM

- Customer Responsibilities
- Vendor Responsibilities
- Acceptance Testing

PRE-INSTALLATION CHECKLIST

	Yes	No	Not Applicable
A. <u>Environment Control</u>			
1. Heating system installed and operational?	_____	_____	_____
2. Air conditioning system installed and operational?	_____	_____	_____
3. Air filters installed?	_____	_____	_____
4. Humidifier/dehumidifier installed and operational?	_____	_____	_____
5. Carpeting/furniture treated for static electricity?	_____	_____	_____
6. No smoking signs posted in computer room?	_____	_____	_____
B. <u>Electrical Power</u>			
1. Equipment power lines/receptacles installed? (Separate from all other lines?)	_____	_____	_____
2. Required earth ground installed?	_____	_____	_____
3. Auxiliary power lines/receptacles installed for air conditioner, humidifier, etc.?	_____	_____	_____
4. Lighting fixtures, switches and controls installed?	_____	_____	_____
5. Equipment power lines free of noise?	_____	_____	_____
C. <u>Site Layout</u>			
1. Space allocated for:			
Computer system equipment?	_____	_____	_____
Furniture?	_____	_____	_____
Storage cabinets (Disks, tape, paper?)	_____	_____	_____

PRE-INSTALLATION CHECKLIST (cont'd)

	Yes	No	Not Applicable
2. Furniture and storage cabinets on hand?	_____	_____	_____
3. Computer room floor installed?	_____	_____	_____
4. Cable troughs installed?	_____	_____	_____
5. Routing for data terminal interface cables defined?	_____	_____	_____
6. Data terminal interface cables installed?	_____	_____	_____
D. <u>Fire Prevention</u>			
1. Sprinkler system installed?	_____	_____	_____
2. Fire extinguishers: Acquired?	_____	_____	_____
Positioned/installed?	_____	_____	_____
3. Fire resistant storage cabinets/files installed?	_____	_____	_____
E. <u>Miscellaneous</u>			
1. Window drapes/shades installed?	_____	_____	_____
2. Anti-static carpet treatment completed?	_____	_____	_____
3. Telephone services (voice and data lines, DAA):			
Scheduled?	_____	_____	_____
Installed?	_____	_____	_____
4. Equipment installation plan completed?	_____	_____	_____

SYSTEM STARTUP

- Data Entry/Verification
- Controlling the Paper Flow
- Loading the Data Base
- Problems--What to do When the Computer Stops