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'86 JUL 15 A3:26

6812-04.86.rlj.30  
11 July 1986

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Division of Waste Management  
Office of NMSS  
Mail Stop 623-SS  
U.S. Nuclear Regulatory Commission  
Washington, D.C. 20555

WM-RES  
WM Record File  
A4167  
AFSD

WM Project 10-11-16  
Docket No. \_\_\_\_\_  
PDR   
LPDR B.4.5

Distribution:  
Altomare

Dear Mr. Altomare:

(Return to WM, 623-SS)

Discussion Paper on Capturing Documents  
in Electronic Form

As requested, Aerospace has prepared the subject paper containing a suggested draft specification for capturing documents in electronic form. I feel this may be useful at your next DOE/NRC Licensing Support System Interagency Coordinating Committee meeting as an approach to start capturing word processed documents on magnetic media.

Only by having other organizations send you documents on disks or tapes can you really begin to flush out unsuspected problems. I feel confident that the organizations on the committee will be cooperative and help you in this area.

Very truly yours,  
*R. L. Johnson*  
R. L. Johnson  
Systems Director  
Government Support Division

RLJ:gbf  
Enclosure

cc: A. Bender, NRC  
D. Besbris, SD/PMR (letter only)

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## CAPTURING RECORDS IN ELECTRONIC FORM

A computer-based, licensing support system (LSS) is necessary to manage and have online documents pertaining to the hearings for the high level radioactive waste repository (mandated by the Nuclear Waste Policy Act of 1982.) The LSS would be used by DOE, NRC, the States, Indian Tribes, and other parties as the source of information for every day needs and the licensing hearings. The goal is to make documents and other information pertinent to repository licensing available well before license applications are submitted, thus reducing the need to rely on the discovery process.

All organizations and people connected with the waste repository will make use of the LSS and, thus, will be responsible for following a mutually agreed upon specification defining the requirements for providing data entry to the system in magnetic form. The specification will delineate the scope and completeness of information to be provided to the system as well as the format for submitting information.

In anticipation of the future LSS, NRC is conducting tests on a small-scale interim document storage and retrieval system. For this phase of the tests, participants are requested to follow the attached draft specification to submit documentation prepared on word processors to NRC on magnetic media (electronic form). Documents sent to NRC should follow the attached specification and also be accompanied by a hard copy copy.

The NRC wants to learn through feedback, ways to make the document capture process easier to do for all participants, thus your suggestions on the draft specification or related areas should be directed to:

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Policy & Program Control Branch  
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## BACKGROUND

The Department of Energy (DOE) is responsible for designing and implementing the future LSS system, incorporating online, full-text storage and retrieval techniques. In January 1986, DOE and NRC agreed that a joint effort is required to develop a document management system to meet a 3-year or shorter licensing hearing period. (DOE has requested a 27-month licensing hearing period.) NRC and DOE agreed to define together the requirements and procedures for operation of the system.

In support of LSS implementation, a DOE/NRC Interagency Coordinating Committee was established. Part of the Committee charter is directed to giving early attention to the establishment of standard formats to capture documents in electronic form, where possible, for later transfer to the LSS.

By further agreement, NRC is carrying out a pilot project to demonstrate document storage and retrieval capabilities and to develop processes that could lead to an interim system for use within the NRC (and possibly by others) until the full LSS is implemented by DOE. The experience gained from the pilot project will be made available to DOE for use in expediting the definition of requirements for the LSS.

In the pilot project, a series of demonstration tests have been conducted to evaluate the full-text, online storage and retrieval concept. Using actual records, tests included experiments to evaluate:

- capturing records in electronic form,
- reformatting electronic records into an automated data base, and
- online search and retrieval of information.

Through these tests NRC has gained hands-on experience useful in defining requirements and procedures for capturing information.

The tests on capturing data lead NRC to conclude that

- rekeying from hard copy to create electronic copy is labor intensive;
- current optical character readers are not today's answer for production scanning of hard copy into electronic copy, and
- it is more efficient to capture new records generated on word processors directly in machine-readable form from the originating source.

In support of LSS implementation, NRC proposes to begin capturing documents processed on word processors directly in an electronic format that would be used in an interim system and stored until the LSS is ready to accept records. This approach will provide document

transfer and collection experience useful in the development of document transfer procedures under real life conditions and also to gain a head start in capturing records in electronic form. This initial startup to collect records in electronic form from the originating sources can be thought of as a continuation of the pilot project demonstration.

The proposed format (Attachment 1) was developed during the capture tests and is considered draft, but sufficiently developed to be worthwhile as an interim specification for capturing documents in an electronic form. When documents are sent to the NRC they should be accompanied also by the hard copy form. This will allow for quality control checks to be made and for NRC to capture the documents non-text graphics using digital scanning equipment.

Attachment 1

Draft Interim Specification  
for  
Capturing Records on Magnetic Media

Records to be submitted to NRC in magnetic form should be an ASCII image of the printed text, i.e., all word processor control characters (and 8th bit) codes are removed. The records can be captured on either floppy (flexible) disks or magnetic tapes in standard formats. The following formats are compatible with many word processors and can be recovered through translator software.

Flexible Disks (ANSI draft standard X3B 8.1-1986)

IBM PC/DOS format: 5-1/4 inch, double-sided, double-density, 9 sectors)

ASCII character code, with each line ended with a carriage return and line feed (HEX 0D 0A)

Maximum of 80 characters per line (with 69 characters preferred).

Remove all underline and hyphen characters.

External disk label to identify content.

As an alternative approach, records on IBM PC compatible nine-sector disks will be accepted if in word processor format for DisplayWrite. Other word processor formats may be acceptable but will require discussion.

Magnetic Tape (ANSI X3.39-1973)

Nine track, standard reel-to-reel, 1600 bpi.

ASCII (or EBCDIC) character code, with each line ended with a carriage return and line feed (HEX 0D 0A).

No internal tape label.

Fixed line length 80 character per line (with 69 characters preferred).

Fixed block size (maximum 2048 character per block).

All files on one physical tape must each have the same number of character/record and character/block. Tapes must not be generated using system-independent copy routines. This is most easily accomplished by means of a Fortran READ-WRITE routine rather than a system utility, however, use of IBM IEBGENER is acceptable.

For the interim, send disks (or tapes) with document hard copy directly to the NRC mail address you normally use for document transfer.