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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

OFFICE OF
SOLID WASTE AND EMERGENCY RESPONSE

November 12, 1996

Ms. Catherine A. McCord, Manager
Regulatory Programs and Business Integration Division
Safety-Kleen Corporation
1000 North Randall Road
Elgin, IL 60213-7857

Dear Ms. McCord:

In May, 1996, you and Larry Davenport first met with my staff in the Hazardous Waste Identification Division (HWID) to discuss the use of automated information technologies in the hazardous waste manifest system. During this meeting, you indicated that Safety-Kleen Corp. (Safety-Kleen) had developed the capability to store manifest records electronically at its recycle facility in Denton, Texas. Since Safety-Kleen may wish to implement this system on a national basis, you asked HWID to clarify if this electronic record system complied with current Subtitle C requirements for the use and retention of the Uniform Manifest. By this letter, I am pleased to provide you with the requested clarification.

Based on the information provided to EPA staff by Safety-Kleen's representatives, I conclude that the automated manifest record system operated by the company at its Denton, Texas recycle facility complies with current RCRA record retention and access requirements. This conclusion follows from our finding that the image files stored by Safety-Kleen's system meet the requirements in our current manifest regulations for maintaining manifest copies that bear the handwritten signatures of the generator and subsequent waste handlers. Safety-Kleen's automated system is able to reproduce high quality copies of manifests that include the images of the original handwritten signatures. In

addition, the Safety-Kleen image file system appears to incorporate data integrity and security features which further ensure the trustworthiness of the records and their general admissibility into evidence. Finally, we find that the indexing and automated retrieval features included in the system satisfy RCRA statutory provisions which require facilities to provide RCRA inspectors with reasonable access to their facilities and to their hazardous waste records, including the ability to inspect and copy records. In the enclosure included with this response, we explain this interpretation and our findings in greater detail.

I understand that you have previously received a consistent interpretation from officials in the Texas Natural Resource Conservation Commission, which implements the authorized RCRA hazardous waste program in the State of Texas. To the extent that Safety-Kleen expands its automated record system to facilities in other States, you must verify with the appropriate State agencies that the system will comply with each State's manifest retention regulations and the Rules of Evidence that govern the admissibility of computer generated records in that State's Courts and agencies. Authorized States may implement RCRA programs that include requirements more stringent than the Federal requirements, and not every State has adopted Rules of Evidence that are as liberal as the Federal Rules insofar as admitting electronic copies of documents into evidence.

This response is directed specifically at the system as configured in Denton and described to EPA and OMB staff by Safety-Kleen's representatives at a meeting here on October 3, 1996. However, similar systems used by others could also meet our requirements, if they are designed and operated in accordance with the guidance contained in this letter and the enclosure. In this regard, the generation and storage of image files that include handwritten signatures, the inclusion of design and operating controls which ensure record accuracy, integrity and security, and the inclusion of indexing and file retrieval features which ensure reasonable inspector access are the key factors in this decision.

Thank you for taking the time to share with us information about your company's innovative efforts in adopting an automated approach to manifest record keeping. We believe that systems such as these will demonstrate that automated information technologies

can indeed reduce record keeping burdens, while making access to the data more efficient and timely.

If you have any questions about this response, please contact Michele Anders, Chief of the Generator and Recycling Branch, on 703-308-8551, or Richard LaShier on 703-308-8796.

Sincerely yours,

Michael Shapiro, Director
Office of Solid Waste

Enclosure

David Nielsen, OECA/RED
Ann Stephanos, OECA/RED
Ann Codington, OPPE
David Schwarz, OPPE
George Wyeth, OGC
Dell Billings, DOT/RSPA
Palmer Kelly, OECA/OCE
Nick Swanstrom, OECA/OCE
Rich LaShier, HWID/GRB
Chris Wotz, OMB
David Updike, CIRMD

Waste Management Division Directors, Regions I - X
Tom Kennedy, ASTSWMO)

ENCLOSURE

OSW's Interpretation and Findings Regarding
Safety-Kleen Corp.'s Automated Manifest Record Storage System

I. Issue:

Does Safety-Kleen Corp.'s automated manifest record keeping system, which uses a scanner and Personal Computer (PC) to generate and store electronically image files of completed and signed manifests, comply with the current RCRA regulatory requirements addressing the retention of signed manifest copies by waste handlers, and the RCRA statutory requirement that hazardous waste facilities provide RCRA inspectors with access to their records for inspection and copying?

II. Background

In May, 1996, representatives from Safety-Kleen Corp. (Safety-Kleen) met with management and staff from OSW's Hazardous Waste Identification Division (HWID) to discuss the use of automated information technologies in the hazardous waste manifest system. During this meeting, HWID was advised that Safety-Kleen had developed the capability to store manifest records electronically at its recycle facility in Denton, Texas. Safety-Kleen expressed a desire to proceed with implementing this capability on a national basis, and asked OSW to clarify if this electronic record system complied with current Subtitle C requirements for the use and retention of the hazardous waste manifest.

Subsequently, HWID staff conducted a series of internal meetings on the topic of electronic storage with staff from several interested EPA offices, including the Office of General Counsel, the Office of Regulatory Enforcement, the Office of Criminal Enforcement, and the Office of Policy, Planning, and Evaluation. Since the RCRA manifest requirements touch upon areas within the scope of the hazardous materials transportation laws, staff from the Department of Transportation were also invited to participate in these discussions. These internal discussions

focused on the technical and legal issues presented by electronic record storage, considering both the facts presented by Safety-Kleen and the other types of automated systems that are likely to be encountered as information technologies are relied on increasingly to supplant paper record systems. This discussion will continue as a part of the manifest revisions rulemaking that is now underway in OSWER.

After several internal meetings, we invited Safety-Kleen's representatives to again meet with interested staff to provide additional information on the design and operation of the Denton, Texas record keeping system, and to answer staff questions on the security and accessibility of the stored files. This meeting, attended by EPA and OMB staff, occurred at EPA Headquarters on October 3, 1996.

A. Safety Kleen's Storage System

At the October 3rd meeting, Safety-Kleen was represented by Ms. Catherine McCord, the company's manager for Regulatory Programs and Business Integration, and by Mr. Larry Davenport, the company's vice president for Information Services. Ms. McCord and Mr. Davenport provided much helpful information which clarified staff's understanding of the features and operation of the Denton, Texas automated storage system. Briefly, we understand these to be the key features of the Denton system:

1. Upon receipt of a shipment at the Denton recycle facility, a hard copy of each manifest is scanned, and the image file created by the scanner is saved to disk. The manifest, when scanned, contains the handwritten signatures required under 40 CFR 262.23(a), and these signatures are captured as part of the image file copies.

2. Shortly after scanning the manifests, Safety-Kleen's clerical staff enter some 20 elements of data about the shipment and the manifest into a system index. This index enables Safety-Kleen personnel or RCRA inspectors to access the manifest files by date-of receipt, manifest number, facility name, or other descriptors.

3. The index and manifest retrieval features of the system are

Windows(TM) based applications that support an intuitive, graphical interface with the user. The index to the-retrieval system is activated by "double-clicking" on the index icon that appears on the desktop, and the search for specific manifests is activated by pull down menus and dialog boxes that prompt the user for the fields and data that define the search parameters.

4. The system automatically displays a list of all manifests that respond to a specific search request. The user can then select any item from the displayed list with the computer mouse, and the system will then display the image file of the manifest. The output can be examined on the monitor, or printed as hard copy. Print-outs from the system are typically of the same quality as photocopies of the original documents, and all handwritten signatures appear on the records.

5. At the end of each day, an additional copy of each manifest file scanned into the Denton storage system is transmitted electronically to the company's headquarters in Elgin, Illinois.

B. The Federal Manifest Regulations

The record retention requirements for hazardous waste generators are set forth at 40 CFR Part 262, Subpart D. Taken together, 262.40(a) and 262.23(a) require generators to retain signed copies of completed manifests for a period of 3 years, and provide that the "signed" manifest copies must bear the handwritten signatures of the generator, the transporters accepting the waste for transportation, and the owner or operator of the designated facility, who certifies to the receipt of the waste by signing the manifest. I note that there are similar provisions in the Subtitle C regulations for transporters and treatment, storage and disposal facilities, which taken together, require a "handwritten signature" to be obtained whenever there is a change in the custody of the waste, and require retention for 3 years of these signed copies among the records of the regulated waste handlers. See 263.20(d)(1), 263.22(a), and 264.71.

C. Statutory Requirement for Access to Records

Section 3007(a) of the RCRA statute provides that any person who generates, stores, treats, transports, disposes of, or has

handled hazardous wastes shall, upon the request of any duly designated RCRA inspector, furnish information relating to hazardous wastes to the inspector, and permit such a person at all reasonable times to have access to and to copy all records relating to hazardous wastes.

III. Detailed Discussion

A. The Requirements for Copies Bearing Handwritten Signatures

As summarized above, the current Federal manifest regulations require the generator and each subsequent handler involved with an off-site shipment of hazardous waste to sign the manifest "by hand," and to keep in their files for a 3-year period a copy of the manifest which bears these signatures. The key regulatory compliance issue presented by Safety-Kleen's system is whether the electronically stored image files are created and maintained in such a manner that they qualify as "copies" bearing the necessary "handwritten" signatures. We conclude that the image files meet this standard, because:

(1) The handwritten signatures from the hard copy records are captured by the scanner, incorporated into the stored image files, and reproduced accurately in the output generated by the computer system. Safety-Kleen demonstrated to EPA that the output displays signatures that look no different than the signatures that initially appeared on the scanned hard copies, and the reproduced manifest copies (and signatures) are of the same or better quality than those which are produced by photocopy machines or fax machines. Significantly, this system does not attempt to substitute "digital signatures," PIN Numbers, or other electronic surrogates for the original handwritten signatures.

(2) The image files appear to meet the standards included in the Federal Rules of Evidence for the admission of copies and computer generated records into evidence in judicial proceedings brought in the Federal courts. We believe that the law of evidence provides the proper standard for determining whether these electronic documents (the image files and any printouts generated by the system) are acceptable "copies" within the meaning of our manifest retention regulations. The regulations require these manifest copies to be retained in order that they may be inspected

by RCRA inspectors, and in a proper case, admitted in evidence in RCRA enforcement proceedings or other proceedings (e.g., CERCLA liability) where the information on the manifests may be considered relevant. Thus, their acceptability as inspectable records and possible evidence should be evaluated according to the law of evidence on the admissibility of computer generated records.

A significant factor which distinguishes the admissibility of computer generated records from other types of business records is the trustworthiness of these electronic records. In this context, trustworthiness can be affected by the reliability of the hardware and software that make up the computer system, and by the reliability and accuracy of the data entry and data processing methods used by the operator. In addition, the trustworthiness of electronic records can be enhanced by the presence of"computer security" controls that are directed at controlling unauthorized access to the system and data, and at preventing inadvertent or intentional loss or corruption of the data stored in these records.

Based on the features of the Safety-Kleen system that was explained to EPA and OMB staff, we are reasonably assured that the company's electronic manifest records are accurate and secure. This conclusion is supported by these facts:

- The scanning equipment and software installed by Safety-Kleen are extremely accurate. Fewer than 1% of the manifests that are scanned present difficulties during scanning, and most of these can be corrected by obtaining a better copy of the manifest for scanning or by sharpening the image quality before saving the image to disk.

- Safety-Kleen is merely scanning the original hard copies of completed manifests into its computer system, and not entering new data manually. The quality of the image is verified before the record is saved to disk and the scanning of the paper forms provides minimal opportunities for data entry errors or for alteration of records.

- The Denton facility transmits each night a back-up copy of the electronic manifest records to corporate headquarters in

Elgin, Illinois. Thus, in the event of a fire, flood, or other accident involving the Denton site, the records of waste activity will be secured in Elgin.

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Therefore, we believe that these materials would be admissible in evidence, so that they are acceptable manifest "copies" bearing the waste handlers' "handwritten signatures," as required by the RCRA regulations.

B. Reasonable Access to Records.

The final factor which we considered in determining the acceptability of Safety-Kleen's automated records system is the real world accessibility of the electronically stored manifest records to RCRA inspectors. Section 3007 of the RCRA statute states that any person who generates, stores, treats, disposes, transports, or otherwise handles hazardous wastes must permit EPA or State enforcement personnel access at reasonable times to their facilities as well as to the records relating to their hazardous wastes. Reasonable access to facility records includes the right to inspect and to copy all such records. RCRA 3007(a). Therefore, in considering the merits of any electronic storage system, we must be satisfied that the system would not in any significant way impede the access of RCRA inspectors to the manifest records. In other words, would a RCRA inspector entering a facility with an automated record system enjoy a level of access to individual manifests that is at least comparable to that which he or she would encounter with respect to paper copies maintained in file drawers?

We conclude that Safety-Kleen's system provides adequate assurances of inspector access to electronic manifest files. As the company demonstrated to us, the index and retrieval features of the automated system are implemented from the Windows(TM) desktop, and do not require more than rudimentary familiarity with the Windows(TM) operating system and its pull-down menus and dialogue boxes. The data elements that may be searched are suggested in a pull down menu, and once a selection is made (e.g., manifest #, date of receipt, facility name) the user is prompted for the data that define the search request. The index and retrieval systems are very intuitive, and lead one to a list of responsive files, which if selected, generates the image of the

manifest for examination or printing. We believe that an inspector would only need a few minutes to become familiar with the operation of this system. Once comfortable with the retrieval system, the inspector would actually enjoy a superior level of access compared to paper files, since the index feature now supports searches on about 20 data elements. Thus, an inspector should be able to focus his or her inspection efforts much more efficiently with the automated system and target the search as necessary.

Therefore, for the reasons stated above, we are satisfied that Safety-Kleen's image file storage system meets current RCRA requirements for retention of copies bearing the handwritten signatures of waste handlers, and for ensuring reasonable access by enforcement personnel to Safety-Kleen's manifest records for inspection and copying. This interpretation is directed specifically at the system as configured in Denton, Texas, and described to EPA and OMB staff by Safety-Kleen's representatives at our meeting on October 3, 1996. However, similar systems used by others could also meet RCRA requirements, if they are designed and operated in accordance with the guidance contained in this interpretation. In this regard, the generation and storage of image files that include handwritten signatures, the inclusion of design and operating controls which ensure record accuracy, integrity and security (and thus admissibility of the records in evidence), and the inclusion of indexing and file retrieval features which ensure reasonable inspector access are the key factors in this decision.

Because this issue touches upon the use of innovative information technologies, and involves regulations and interpretations that have national significance, we are distributing this interpretation to the Regional Waste Management Division Directors and to the Association of State and Territorial Solid Waste Management Officials. We will also make this interpretation available through the OSWER Home Page on the Internet.