

An Integrated SARA Reporting System

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ABSTRACT

Mallinckrodt Inc. has recently implemented a custom designed environmental data management system to meet SARA reporting requirements at the St. Louis facility. The SARA system is a Visual Basic/Access-based Windows system using Crystal Reports as the report generator. The SARA system is directly integrated with the facility's production, accounting, and MSDS systems to receive SARA related information.

What makes this SARA system unique is the ability to collect and process, on a daily basis, facility production and storage information from the facility's AS400 mainframe. This inventory information is saved for each product and gives daily resolution on the amount and location of SARA chemicals on-site. The Windows interface allows the users to search and browse through the daily inventories providing information on product amount, MSDS information, location and storage information.

The SARA reporting system has significantly improved the SARA reporting capabilities at the Mallinckrodt St. Louis facility. The integration with facility production and accounting systems and corporate MSDS information has greatly shortened the time required to compile the SARA data and allows Mallinckrodt the additional time to assure the quality of the information.

INTRODUCTION

Mallinckrodt Inc. has recently implemented a custom designed environmental data management system to meet SARA reporting requirements at the St. Louis facility. The SARA system is a Visual Basic/Access-based Windows system using Crystal Reports as the report generator. The SARA system is directly integrated with the facility's production, accounting, and MSDS systems to receive SARA related information.

The Windows based system is a vast improvement over Mallinckrodt's prior method of collecting product information on a monthly basis and reporting the SARA information based on the 12 monthly values. The SARA system collects and processes, on a daily basis, facility production and storage information from the facility's AS400 mainframe. This inventory information is saved for each product and gives daily resolution on the amount and location of SARA chemicals on-site. Access to this information gives plant environmental personnel key information that is

also used

outside of the SARA reporting requirements. For example, if an incident or fire were to occur at a specific location, environmental personnel can alert emergency responders to the type of materials they can expect to find on-site that day.

The Windows interface allows the users to search and browse through the daily inventories providing information on product amount, MSDS information, location and storage information. The MSDS information is obtained electronically by interacting with the corporate Access-based MSDS system. The system also accepts product information on storage tank levels from a standalone storage tank management system.

The user interface allows environmental users to quality assure the information received from the production and accounting systems and override any suspect data. To produce the SARA reports, the system automatically generates 311, Tier II and 313 threshold reports from the information in the system.

SYSTEM OVERVIEW

Prior to implementing this system Mallinckrodt Inc. would acquire chemical inventory and storage information on a monthly basis from the production/accounting mainframe. The twelve monthly data values for each material were then used to report the SARA 311 and Tier II information.

A new Windows-based system was developed using Microsoft's Visual Basic and Access to improve data resolution and speed up the preparation of these reports. A tie-in to the AS400 accounting/production system was created to allow users, on a daily basis, to download into an Access databases the previous day's inventory of material on-site along with storage locations.

The information downloaded from the AS400 is sorted by item code/index. The item code and index is a unique Mallinckrodt number for all products and raw materials. The Visual Basic system displays this material inventory data based on item code/index. The Windows screens consist of five tabbed flip cards. The first flip card displays the item code and the inventory information. The data grid on this screen gives the inventory date and the amount of material along with the appropriate weight units as well as pounds. The screen also shows the daily maximum and overall average amount of material in pounds for this item code based on the downloaded data. (Figure 1) The upper right portion of the screen shows if the item code has any special classification. If the material/product is a drug, cosmetic, food additive or FDA exempt, it is marked so it can be excluded from the SARA reports. The screen has maneuvering buttons at the bottom along with a search capability by item code/index to jump to a particular record.

The item code inventory information obtained from the accounting/production system is added to the current yearly database along with the chemical constituents and hazard classification information from the MSDS databases. Mallinckrodt has two separate electronic MSDS databases from which the system obtains information. The corporate MSDS database is an Access-based system that contains MSDS information for all Mallinckrodt products. The second

database is the vendor MSDS system that includes raw materials used from outside vendors. The SARA system extracts from each MSDS database, if present, the appropriate hazard and chemical constituent information. (Figure 2) If the item code is found in both the corporate and vendor databases, the system uses the Mallinckrodt corporate information for hazard and constituent information. A MSDS Reference tab gives information on the source of the MSDS data used in the system. (Figure 3)

The location and storage information for the inventory material is also downloaded from the AS400. Figure 4 shows the screen for material locations and storage condition by Mallinckrodt item code around the site. The system displays all unique entries of storage location. The user has the ability to edit the information to add additional locations or combine like buildings, etc.

The information in the system is mainly used for the SARA reporting process, but the data in the system also has other applications. The daily inventory allows the user to call up a snapshot for any day of the amount of a chemical on-site and all storage locations. This is also useful in case of an emergency. The system quickly can provide an inventory of the material at a location on-site and allow emergency responders to know what they may have to deal with at that location.

REPORTING PROCESS

The process of preparing the SARA reports is on the reports tab. (Figure 5) The first report, *No MSDS or Chemkey Available* checks the material inventory data that was downloaded for the year on a daily basis. This report looks to see if any of the materials listed in the inventory system do not have MSDS information available on-line from either the corporate or vendor MSDS systems. The report prints a list for the user to check the MSDS databases and obtain / update the missing data.

The *FDA Exempt Items* report gives a printed list of the inventory items that are in the database that are exempt from the SARA report. These items consist of drugs, food additives and cosmetics.

After the quality assurance check of the chemical data for missing MSDS information, the system produces a report by item code of *material on-site with amounts greater than 500 pounds*. This report starts to give an indication of the material over the SARA thresholds that will be included in the SARA reports.

Material in storage tanks on-site is not included in the production/accounting system. The chemical information for storage tanks are obtained from the individual departments and entered into the SARA Tanks module. (Figure 6) The *Upload Tanks Data* option in the SARA system takes the data from the SARA Tanks module and incorporates the usage and storage location information by item code into the master SARA database.

The *Final Tier II Database* option takes all of the information in the system, material by item code and storage tank data by item code and creates a Tier II database summing item codes by corresponding chemkeys. Chemkeys are unique ID's given to each chemical, whereas item codes vary even for the same chemical. For example, acetone obtained from various vendors will have

different item codes but the chemkey for all acetone item codes is the same. The total pounds of each chemkey is compared to the appropriate threshold (10,000 pounds, EHS , Specific SARA Compound , etc.) and then included in this final Tier II database. This Tier II database contains tables for total amount of material, days on-site (determined from the daily downloads), hazard information and location and storage conditions.

The *Location and Storage Condition Summary Print* option provides a hard copy of the storage locations and conditions information in the database. This report allows the user to do a final quality assurance check on this information before printing the Tier II reports.

The *SARA 311 Report* option prints the 311 report. (Figure 7)

The Tier II Report option allows the user to print all Tier II pages or individual pages in the State specific format. (Figure 8)

The *SARA 313 Threshold Report* uses the material inventory and the SARA 313 list to identify 313 chemicals on-site that can be candidates to meet the usage thresholds. This option prints a list with the amount of SARA 313 chemical on-site.

CONCLUSION

The SARA reporting system has significantly improved the SARA reporting capabilities at the Mallinckrodt St. Louis facility. The integration with facility production and accounting systems to easily receive daily on-site inventory and the direct tie-in to the corporate and vendor MSDS information has greatly shortened the time required to compile the SARA data. The increased number of data points (daily inventory) gives a more accurate accounting of inventory on-site than taking twelve monthly values. This system has allowed Mallinckrodt the additional time to assure the quality of the information and provide more detailed SARA reports.

Figure 1. Material Inventory by Item Code and Index.

SARA Database

Inventory Master | MSDS | Location/Storage | MSDS Reference | Reports

Item Description: ACETONE AR (ACS)

Item Code: 2440 | Index: 24 | Maximum (lbs.): 62650 | Average (lbs.): 31301.05

Classification:
 FDA Exempt | Cosmetic
 Drug | Food Additive

	Inventory Date	Amount Lbs	Amount	Units #
▶	01/14/1997	9800	9800	51
	01/21/1997	9800	9800	51
	01/28/1997	20650	20650	51
	01/29/1997	20650	20650	51
	01/31/1997	21000	21000	51
	02/03/1997	21000	21000	51
	02/04/1997	21000	21000	51
	02/05/1997	21000	21000	51
	02/07/1997	51800	51800	51
	02/11/1997	51800	51800	51
	02/12/1997	61950	61950	51
	02/13/1997	61950	61950	51
	02/14/1997	62650	62650	51

Item Code Search: [] [Find Item]

Exit | Top | Previous | Next | Bottom

Figure 2. MSDS and Hazard Classification Information.

The screenshot shows the 'MSDS Reference' tab in the SARA Database. The 'Chemkey' field is populated with 'A0446'. The 'Pure' field is 'P' and the 'Physical State' field is 'L'. Under the 'Hazards' section, the following options are checked: 'Fire', 'Immediate (Acute)', and 'EHS'. The 'Constituents' table below shows one entry:

CAS Number	Name	Percent	RQ	TPQ
67-64-1	Acetone	100	5000	0

Figure 3. Corporate and Vendor MSDS Reference Tab.

The screenshot shows the 'MSDS Reference' tab with 'Item Description' set to 'ACETONE AR (ACS)' and 'Chemkey' set to 'A0446'. The 'Corporate MSDS' radio button is selected. The 'MSDS Reference' section shows an 'Item Code' of '2440' and a 'Number of Records' of '1'. The 'MSDS Name' field contains 'ACETONE'. The 'Vendor Reference' section is currently empty.

Figure 4. Material Storage Location and Conditions Tab.

Storage Location

Item Code: 244019 Item Code Not Found

Item Description: ACETONE AR (ACS)

Package Description: 20 LITER ST DRUM

Location	Description
3003YD	PLANT 3 YARD 3
3053PAD	63 pad
30533	BUILDING 63-3
30534	BUILDING 63-4
3057A	BUILDING 67 - section A
3074	BUILDING 74

Storage Conditions

Item Code: 244019 Item Code Not Found

Planner Code: []

Storage Code: D Storage Description: STEEL DRUM

Item Description: ACETONE AR (ACS)

Temp.: 4 Pressure: 1 ContainerCode: 600

Figure 5. SARA Reports Tab.

SARA Reports

- No MSDS or Chemkey Available
- FDA Exempt Items
- Chemkey by Item Code > 500 lbs - T2.mdb
- Upload Tanks Data
- Create Final Tier II Database - TierII.mdb
- Location and Storage Condition Summary Print
- SARA 311 Report
- Tier II Report
- SARA 313 Threshold Report

OK

Figure 6. SARA Tanks Inventory System Screen.

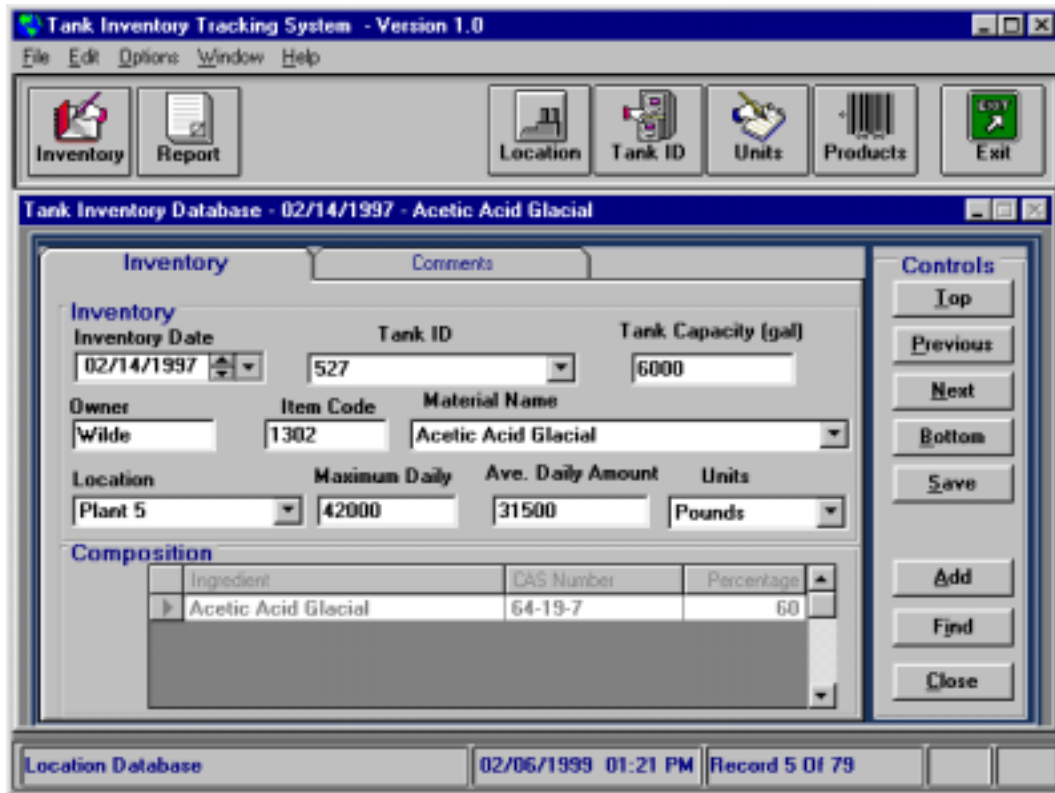


Figure 7. Example of Sara 311 Report Printout.

Mallinckrodt Inc - St. Louis Plant
SARA 311 Report
as of 12/31/98

Page: 1

Hazard Code	A	C	F	P	R	Chemkey	Chemical Name
	X	X	X	X	X	A0326	ACETIC ACID GLACIAL
	X		X			A0446	ACETONE
	X	X				A5916	AMMONIUM HYDROXIDE
			X			ALUSD	ALUMINUM STEARATE
	X	X				B0348	BARIUM CARBONATE
	X					B3336	BISMUTH METAL
	X	X				B3432	BISMUTH SUBCARBONATE
	X	X				C0330	CALCIUM CARBONATE

Figure 8. Example of Tier II Report Printout for Missouri.

Missouri Emergency Response Commission, P.O. Box 3133, Jefferson City, MO 65102 Missouri Department of Public Safety		[1] Reporting Period: January 1, 1997 To December 31, 1997		Page 1 of 61
Missouri Tier Two For EPCRA Sections 302, 303, 311 and 312; and Section 292.605RSMo	[2] Facility Identification: County: St. Louis, City Name Mallinckrodt Chemical, Inc. Street Address 3600 N. 2nd Street City St. Louis State MO Zip 63147		[3] Owner/Operator Name: Name Mallinckrodt Chemical, Inc. Mail Address 16305 Swingley Ridge Dr. Chesterfield, MO 63017 Phone 314-530-2000	
	SIC Code: 28XX Dun & Brad # 096726484		[4] Emergency Contact: Name M. Puett Title Environmental Manager Phone 314-539-1344 24 Hr Phone: 314-458-5989 Name Ken Coffey Title Fire Chief Phone 314-539-1683 24 Hr Phone: 314-825-4511	
Are any explosives listed? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		Is this facility a family farm or owned by local government? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		
Important: Read all instructions before completing form [5] <input type="checkbox"/> Initial Submission <input checked="" type="checkbox"/> Update Check if information is identical to last year. <input type="checkbox"/>				
[6a] Chemical Description		[6b] Physical and Health Hazards (check all that apply)	[6c] Inventory In Pounds	[6d] Storage Codes and Locations (Non-Confidential) C P T
Cas No. 64-19-7 Trade Secret <input type="checkbox"/> Chemkey: A0326 Chem. Name: ACETIC ACID GLACIAL Check all Pure Mix Solid Liquid Gas that apply: <input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/>		<input checked="" type="checkbox"/> Fire <input type="checkbox"/> Sudden Release of Pressure <input checked="" type="checkbox"/> Reactivity <input checked="" type="checkbox"/> Immediate (acute) <input checked="" type="checkbox"/> Delayed (chronic) <input type="checkbox"/> Extremely Haz. Substance	82,317 Maximum daily amount 57,259 Average daily amount 365 Number of Days on site <input type="checkbox"/> Optional Report	I 1 4 BUILDING 63 I 1 4 BUILDING 66 I 1 4 PLANT 3 YARD 3 A 1 4 Plant 5 I 1 4 YARD 3 HOT HOUSE
Cas No. 67-64-1 Trade Secret <input type="checkbox"/> Chemkey: A0446 Chem. Name: ACETONE Check all Pure Mix Solid Liquid Gas that apply: <input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/>		<input checked="" type="checkbox"/> Fire <input type="checkbox"/> Sudden Release of Pressure <input type="checkbox"/> Reactivity <input checked="" type="checkbox"/> Immediate (acute) <input type="checkbox"/> Delayed (chronic) <input type="checkbox"/> Extremely Haz. Substance	62,670 Maximum daily amount 31,321 Average daily amount 365 Number of Days on site <input type="checkbox"/> Optional Report	D 1 4 BUILDING 63-3 D 1 4 BUILDING 67 D 1 4 BUILDING 74 D 1 4 PLANT 3 YARD 3
[7] Certification (Read and sign after completing all sections) I certify under penalty of law that I have personally examined and am familiar with the information submitted in pages one through 61, and that based on my inquiry of those individuals responsible for obtaining the information, I believe that the submitted information is true, accurate and complete.			[8] Optional Attachments <input checked="" type="checkbox"/> I have attached a site plan <input type="checkbox"/> I have attached a list of site coordinate abbreviations <input type="checkbox"/> I have attached a description of dikes and other safeguard measures	
Karen A. Siebenberger, Environmental Engineer Name and Official Title of Owner/Operator's Authorized Representative Signature _____			_____ Date Signed	