

Health & Safety / Incident Tracking

Paper # 429

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ABSTRACT

A custom system was developed to record health and safety incidents, near misses, and management of change activities tracked by the safety and environmental department at the Mallinckrodt Baker, Inc. facility in Paris, KY. The Health & Safety / Incident Tracking System is a Windows-based system that maintains all incident case information in a detailed data entry format that includes location, description, cause, losses, injury / illness, spills and corrective actions. Each incident is also rated on a severity scale and depending on the severity of the incident specific corrective actions are required.

The reports produced by the Health & Safety / Incident Tracking System are tabular and graphical detailing case information and corrective action requirements. The system also produces reports of completed and outstanding corrective actions along with the responsible person.

INTRODUCTION

The Mallinckrodt Baker facility, located in Paris Kentucky, manufactures and stores specialty chemicals. In order to track and manage the health and safety issues at the facility a custom system was developed to record health and safety incidents, near misses, and management of change activities tracked by the safety and environmental department at the Mallinckrodt Baker, Inc. facility in Paris, KY. The Health & Safety / Incident Tracking System is a Windows-based system that maintains all incident case information in a detailed data entry format that includes location, description, cause, losses, injury / illness, spills and corrective actions. Each incident is also rated on a severity scale and depending on the severity of the incident specific corrective actions may be required.

The reports produced by the Health & Safety / Incident Tracking System are tabular and graphical detailing case information and corrective action requirements. The system also produces reports of completed and outstanding corrective actions along with the responsible person.

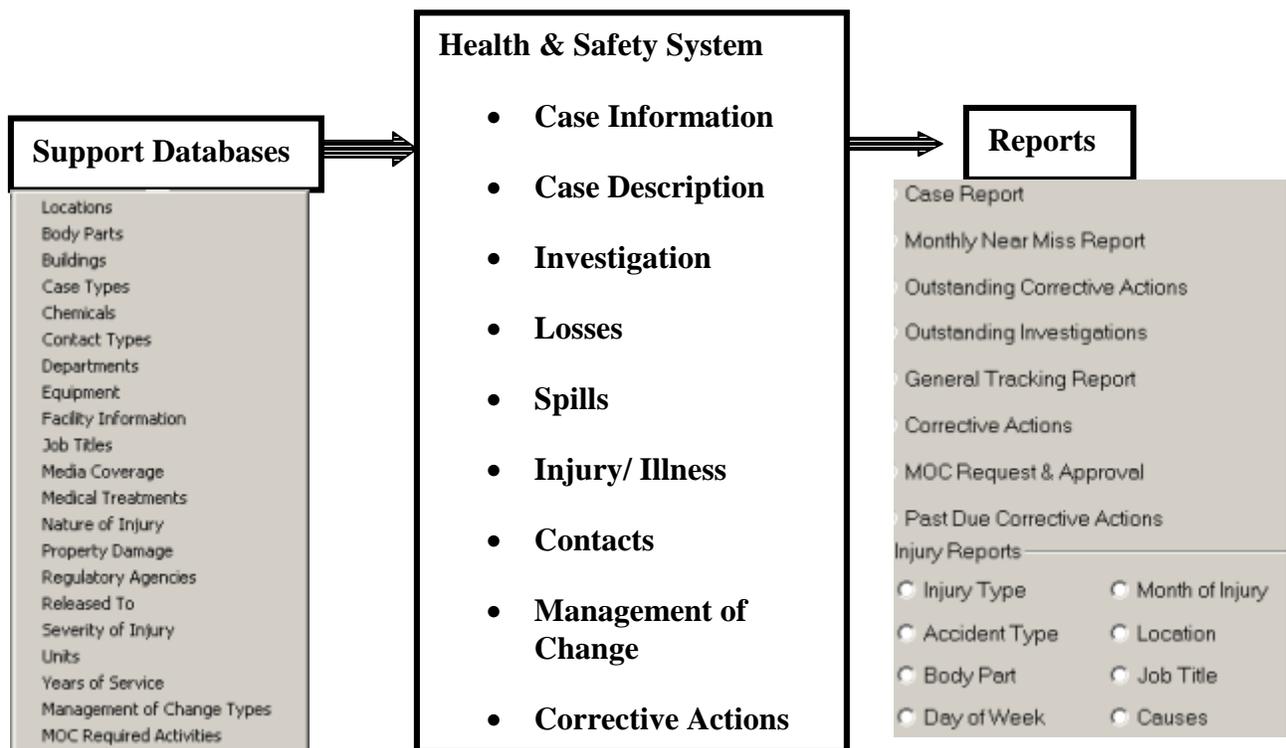
HEALTH & SAFETY SYSTEM

The Health & Safety system for Mallinckrodt Baker, Inc. is an outgrowth from the manual tracking of health & safety requirements throughout Mallinckrodt. The Windows-based system was implemented to provide a comprehensive health and safety tracking system, a corrective action tracking system and produce internal and external reports.

The Health & Safety system was developed using Microsoft's Visual Basic 6. The underlying database used throughout the system is Microsoft Access. The reports that are produced in the system use Crystal Decision's Crystal Reports. The reports are then distributed to responsible personnel via email.

The overall structure of the Health & Safety system is shown in Figure 1.

Figure 1. Overall Structure of the Health & Safety System.



The Support Databases contain the information that is used to populate droplists throughout the system. The Cases entered into the system maintain all of the information on an incident and the reports produced meet the requirements for reporting and tracking.

The Health and Safety system is used by safety and environmental department, but is also available in a read only form to other departments and personnel around the facility. The system maintains all of the health & safety incidents at the site. Besides just tracking health & safety incidents, a Management of Change module is also part of the overall system. The management of change section tracks / documents all temporary and permanent changes that take place at the facility.

When starting up the system users are presented with the menu bar shown in Figure 2.

Figure 2. Health & Safety System – Menu Bar.

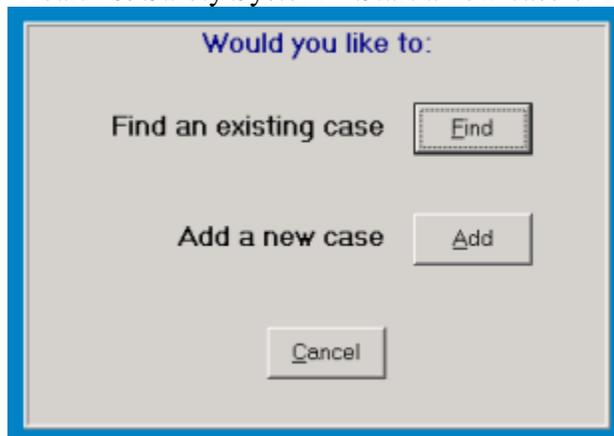


The buttons across the top of the screen have the following functionality:

- Cases - Maintains all health & safety incident information
- New MOC – A short cut to initiating a change at the facility
- Reports – Generate Reports
- Definitions – Maintains definitions used for case severity / probability of occurrence
- Employees – A support database containing personnel information
- Additional Tables – Support tables used as droplists throughout the system

When a user selects the Cases button, the first screen asks the user to either work on a previously entered case or start a new case (Figure 3).

Figure 3. Health & Safety System – Start a new case or locate an existing case



When selecting an existing case or starting a new case, the first screen that is displayed (Figure 4) is the Case flipcard. This screen gives the specifics of a case. Note that each case is identified by a unique identifier that is composed of a site descriptor, year, month and the sequential number of cases for that month.

The other flipcards allow the user to enter additional detailed information about the incident.

Figure 4. Case – Case Description.

The screenshot shows a software window titled "Malinckrodt Baker Health & Safety Case Tracking System". The main window is titled "Cases - [PAR04-01-0001]". It features a menu bar with "File", "Edit", "Options", "Admin", "Window", and "Help". Below the menu bar is a navigation bar with buttons for "Cases", "New MOC", "Reports", "Definitions", "Employees", "Additional Tables", and "Exit". The main content area is divided into several sections:

- Case Information:** Includes fields for Case Number (PAR04-01-0001), Department (MANUFACTURING), Case Date (01/14/2004), and Case Time (12:00 PM).
- Event Details:** Includes Exact Location of Event (Building 106A), Initial Report (01/14/2004), and a checkbox for Investigation Report Required? (checked).
- Personnel:** Includes Initiated By (Smith, Jim), Audit Type (INTERNAL), and Person Accountable for Case (Allen, Jim).
- Case Types:** A list of case types on the left (AUDIT, CHEMICAL RELEASE - AIR, CHEMICAL RELEASE - LEAK, CHEMICAL RELEASE - SEWE, CHEMICAL RELEASE - SPILL, FIRE/EXPLOSION, INJURY/ILLNESS, MOC - PERMANENT, MOC - TEMPORARY) and a "SelectedTypes" list containing "INJURY/ILLNESS".
- Controls:** A vertical stack of buttons: Top, Previous, Next, Bottom, Save, Edit, Add, Delete, Find, Close.
- Update Log:** A section with fields for Date Entered (1/21/2004), Entered By (HPSS), Last Updated (1/21/2004), and Updated By (HPSS).

The status bar at the bottom displays "D:\TSMALLINKRODT H&S CASE TRACKING\H&S Case Tra HPSS ADMIN Record 1 Of 168 1/21/2004 10:17 AM".

Figure 5 shows the Description flipcard where the user provides detailed information on what occurred in this incident. Note that this screen also includes a severity scoring system based on the severity of the loss and the probability of the occurrence of the event. The severity score then instructs the user on a course of action. Depending on the severity of the incident, the outside media may respond to and report on an incident. If this happens, who was present from the outside media is recorded on this screen.

Figure 5. Case – Incident Description

The screenshot displays a software application window with a tabbed interface. The active tab is 'Desc'. The main content area is divided into several sections: a text box for the incident description, a section for severity and probability settings, a media coverage selection area, and a red text box for evaluation notes. A right-hand sidebar contains navigation and control buttons, and an update log section at the bottom right.

Figure 6 shows the Investigation flipcard that allows the user to select the reasons for the incident. These include substandard actions, substandard conditions, personal factors, job factors or other factors that may have contributed to the incident. The user can select one or more factors that best describe the event.

Figure 6. Case – Investigative Reasons.

The screenshot shows a software window with a menu bar at the top containing 'Case', 'Desc', 'Invest.', 'Losses', 'Spills', 'MOC', 'Injury', 'Contacts', and 'Actions'. Below the menu bar, there are sub-tabs: 'Sub. Action', 'Sub. Conditions', 'Personal Fact', 'Job Factors', 'Other Factors', and 'Investigation'. The main area is divided into two panes. The left pane, titled 'Substandard Actions', contains a list of 20 items, with 'UNSAFE POSITION AND/OR POSTURE' highlighted in blue. The right pane, titled 'Selected Causes', contains the same item. Between the panes are two arrow buttons: a right-pointing arrow (--) and a left-pointing arrow (←). To the right of the main area is a 'Controls' panel with buttons for 'Top', 'Previous', 'Next', 'Bottom', 'Save', 'Edit', 'Add', 'Delete', 'Find', and 'Close'. Below the controls is an 'Update Log' section with fields for 'Date Entered' (1/21/2004), 'Entered By' (HPSS), 'Last Updated' (1/21/2004), and 'Updated By' (HPSS), along with a 'Deleted' checkbox.

The Losses flipcard (Figure 7) allows the user to quantify the internal or external capital losses that may have occurred during the event. Also included on this screen is any damage or losses to equipment or property.

Figure 7. Case – Incident Losses.

The screenshot shows a software window with a menu bar at the top containing 'Case', 'Desc', 'Invest.', 'Losses', 'Spills', 'MOC', 'Injury', 'Contacts', and 'Actions'. Below the menu bar, there are sub-tabs: 'Internal Losses' and 'External Losses'. The 'Internal Losses' section has a radio button group for 'Actual / Estimated' with 'Estimated' selected. It includes a dropdown for 'Amount of Property Damage' (set to '\$1,000 - \$5,000'), a dropdown for 'Equipment Damaged' (set to 'NONE'), a text input for 'Equipment Number', and a text area for 'Property Damaged / Nature of Damage' containing the text 'Stained the protective coating on the building floor.'. The 'External Losses' section has a radio button group for 'Actual / Estimated' with 'Actual' selected, a dropdown for 'Amount of Property Damage', and a text area for 'Property Damaged / Nature of Damage'. To the right is a 'Controls' panel with buttons for 'Top', 'Previous', 'Next', 'Bottom', 'Save', 'Edit', 'Add', 'Delete', 'Find', and 'Close'. Below the controls is an 'Update Log' section with fields for 'Date Entered' (1/21/2004), 'Entered By' (HPSS), 'Last Updated' (1/21/2004), and 'Updated By' (HPSS), along with a 'Deleted' checkbox.

If the case involved a spill of a material the Spills flipcard (Figure 8) allows the user to select the materials spilled, the amount, duration and where the spill was released to. If there are any off-site impacts, a narrative of these impacts is added on the Off-Site Impact tab along with the wind speed, wind direction and temperature at the time of the incident.

Figure 8. Case – Spill Information.

The screenshot displays a software interface for recording spill information. At the top, a navigation bar includes tabs for Case, Desc, Invest., Losses, Spills (active), MOC, Injury, Contacts, and Actions. The main window is divided into two panes: 'Chemicals/Radioactive Material Released' and 'Off-Site Impact'. The left pane shows a list of chemicals under the heading 'Releases', with 'SULFURIC' selected. Below this list are input fields for 'Amount' (50), 'Units' (GALLONS), and 'Release Duration' (0 hours, 3 minutes). The right pane shows 'SULFURIC ACID' in a list. Below it is a 'Released To' section with a dropdown menu showing 'CONCRETE FLOOR' selected. A 'Controls' panel on the right side contains buttons for Top, Previous, Next, Bottom, Save, Edit, Add, Delete, Find, and Close. An 'Update Log' section at the bottom right shows the date entered (1/21/2004), entered by (HPSS), last updated (1/21/2004), and updated by (HPSS), with a checkbox for 'Deleted'.

If an injury or an illness occurred as part of this case then the Injury flipcard (Figure 9) gives the specifics on the injured/ill personnel. Note that this flipcard allows the entry of multiple personnel that may have been injured during an event. This screen contains general job experience information on the employee as well as specifics on any injuries and treatment.

Figure 9. Case – Injury Information.

The screenshot shows the 'Injury' information form. The 'Injury #' is 1. The employee is Smith, Allen, Male, Employee Number 356, Department MANUFACTURING, Job Title LAB TECHNICIAN, Date of Birth 01/11/1972, Years Of Service 1 - 5 YEARS, Employee's Supervisor Jones, Mark, Experience In Current Job 1 - 5 YEARS, Severity Of Injury MINOR, Contact Type STRUCK AGAINST, and Nature Of Injury LACERATION. The Update Log table shows the following data:

Date Entered	Entered By	Last Updated	Updated By	Deleted
1/21/2004	HPSS	1/21/2004	HPSS	<input type="checkbox"/>

If during an incident an outside (non Mallinckrodt Baker personnel) responder is present or must be notified, the information on this contact is stored on the Contact flipcard (Figure 10). Note that this flipcard allows the entry of multiple contact personnel.

Figure 10. Case – Contacts

The screenshot shows the 'Contacts' information form. The 'Contact #' is 1, 'Regulatory Agency or Emergency Responder Contact' is AMBULANCE, 'Regulatory Date' is 01/14/2004, 'Contact Person' is Tom Smith, and 'Responder To Scene' is Yes. The Update Log table shows the following data:

Date Entered	Entered By	Last Updated	Updated By	Deleted
1/21/2004	HPSS	1/21/2004	HPSS	<input type="checkbox"/>

If during an incident corrective actions are identified to help prevent future occurrences, the individual corrective actions are included on the Actions flipcard (Figure 11). Each corrective action is assigned a responsible person and a date to complete. After the corrective action is completed, a date completed and final disposition of the action is entered on this screen.

Figure 11. Case – Corrective Actions

The screenshot displays the 'Case - Corrective Actions' window. At the top, a navigation bar includes tabs for Case, Desc, Invest, Losses, Spills, MOC, Injury, Contacts, and Actions. The 'Actions' tab is active. On the left, a 'Controls' panel contains buttons for Top, Previous, Next, Bottom, Save, Edit, Add, and Delete. The main workspace is titled 'Corrective Actions' and contains the following fields:

- Action #:** 1
- Corrective Action:** Add additional caution signs in work areas.
- Date To Complete:** 01/23/2004
- Date Completed:** 01/26/2004
- Responsible People:** A list containing Sargent, Mitch; Scott, Johnny; Snyder, Gary; Taylor, Ron (highlighted); and Thurston, Jim. An 'Add' button is next to the list.
- Responsible People (Right):** Taylor, Ron
- Final Disposition:** Change implemented

At the bottom, an 'Update Log' section shows the following data:

Date Entered	Entered By	Last Updated	Updated By	Deleted
1/21/2004	HPSS	1/21/2004	HPSS	<input type="checkbox"/>

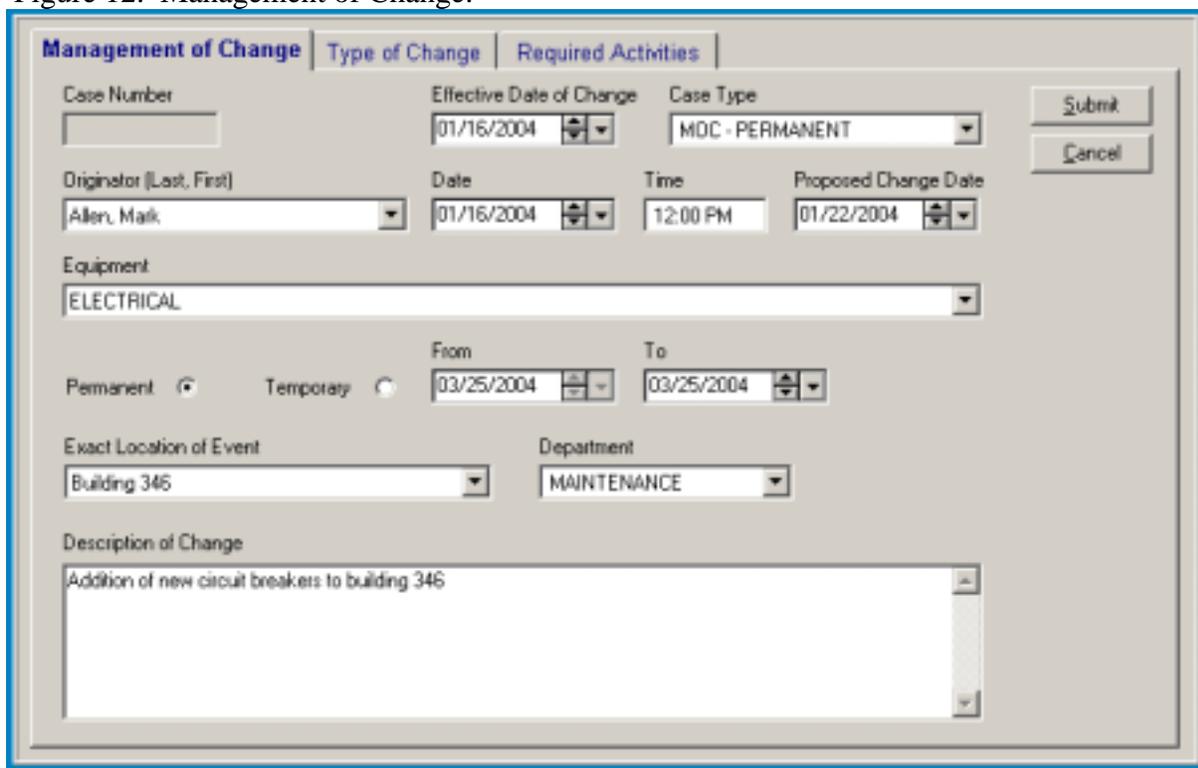
On the right side, a secondary 'Controls' panel includes buttons for Top, Previous, Next, Bottom, Save, Edit, Add, Delete, Find, and Close. Below these is another 'Update Log' section with fields for Date Entered (1/21/2004), Entered By (HPSS), Last Updated (1/21/2004), and Updated By (HPSS), along with a Deleted checkbox.

MANAGEMENT OF CHANGE

In addition to tracking Health & Safety incidents, the system is integrated with a Management of Change System. The reason for this is that typically, a temporary or permanent change at the facility is driven by corrective actions resulting from health & safety incidents. So a management of change module was incorporated into this system.

When the user selects Management of Change, the screen in Figure 12 is displayed. This screen lets the user enter specific information about the change.

Figure 12. Management of Change.



The screenshot shows a web-based form titled "Management of Change" with three tabs: "Management of Change", "Type of Change", and "Required Activities". The form contains the following fields and controls:

- Case Number:** An empty text input field.
- Effective Date of Change:** A date picker set to 01/16/2004.
- Case Type:** A dropdown menu set to "MDC - PERMANENT".
- Submit/Cancel:** Two buttons located to the right of the Case Type dropdown.
- Originator (Last, First):** A dropdown menu set to "Allen, Mark".
- Date:** A date picker set to 01/16/2004.
- Time:** A text input field set to "12:00 PM".
- Proposed Change Date:** A date picker set to 01/22/2004.
- Equipment:** A dropdown menu set to "ELECTRICAL".
- Permanent/Temporary:** Two radio buttons. "Permanent" is selected.
- From/To:** Two date pickers, both set to 03/25/2004.
- Exact Location of Event:** A dropdown menu set to "Building 346".
- Department:** A dropdown menu set to "MAINTENANCE".
- Description of Change:** A text area containing the text "Addition of new circuit breakers to building 346".

The next flipcard (Figure 13) allows the user to select the type of changes that are to be made at the facility. The user can select multiple types.

Figure 13. Management of Change – Type of Change.

Type Of Change	
<input type="checkbox"/>	PROCESS CHEMISTRY
<input type="checkbox"/>	CHEMICAL INVENTORY
<input type="checkbox"/>	SAFE OPERATING LIMITS
<input type="checkbox"/>	PROCESS FLOW
<input checked="" type="checkbox"/>	ELECTRICAL COMPONENTS / CLASSIFICATIONS
<input type="checkbox"/>	PIPING (MANUFACTURER, TYPE, ROUTING)
<input type="checkbox"/>	MATERIALS OF CONSTRUCTION
<input type="checkbox"/>	DESIGN CODES
<input type="checkbox"/>	RELIEF SYSTEMS
<input type="checkbox"/>	UTILITIES
<input type="checkbox"/>	INSTRUMENTATION / CONTROLS
<input type="checkbox"/>	EQUIPMENT MODIFICATION / ADDITION / REMOVAL
<input type="checkbox"/>	PROCESS / PROCEDURES
<input type="checkbox"/>	FACILITIES MODIFICATION

The Required Activities flipcard (Figure 14) lists the activities that must take place during this change during the pre-approval, pre-startup and post-startup time period along with the responsible person for these activities. Multiple required activities can be selected for this change.

Figure 14. Management of Change – Required Activities

Required Activities						
	Required Activity	Pre-Approval	Pre Start-up	Post Start-up	Responsible	Due D ▲
<input checked="" type="checkbox"/>	Modify P&ID'S	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Casey, Jeff	
<input type="checkbox"/>	Change process flow diagrams	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
<input type="checkbox"/>	Cleaning/passivation of piping	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
<input type="checkbox"/>	Verification of passivation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
<input type="checkbox"/>	Modify or write new work	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
<input type="checkbox"/>	Employee training and	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
<input type="checkbox"/>	Process Hazards Analysis	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
<input type="checkbox"/>	Pre start up safety review	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
<input type="checkbox"/>	Relief system calculations	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
<input type="checkbox"/>	Control logic changes	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
<input type="checkbox"/>	Specifications of interlocks and	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
<input type="checkbox"/>	Modify BPR's and Master	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
<input type="checkbox"/>	Validation procedures and protocol	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
<input type="checkbox"/>	Modify environmental permits	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
<input type="checkbox"/>	Product stability studies	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
<input type="checkbox"/>	Modify preventative maintenance	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
<input type="checkbox"/>	Notify customer	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
<input type="checkbox"/>	Closure of MOC	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		

After completing a Management of Change request, a report is automatically generated with the entered information (Figure 15). This report is then distributed to all personnel at the facility who are affected by the change.

Figure 15. Management of Change - Report.

Mallinckrodt Baker Health & Safety Case Tracking System - [MOC Request 8& Approval]

File Edit Options Admin Window Help

Cases New MOC Reports Definitions Employees Additional Tables - Exit

1 of 1 Total: 21 100% 21 of 118

MANAGEMENT OF CHANGE REQUEST AND APPROVAL

CHANGE NUMBER: PAR0401-0003 EFFECTIVE DATE OF CHANGE (to be assigned after approval): 1/16/2004

ORIGINATOR: Allen, Mark DATE: 1/16/2004 PROPOSED CHANGE DATE: 1/21/2004

Process/Equipment Affected: ELECTRICAL

Permanent Temporary From: _____ To: _____

DESCRIPTION OF CHANGE (include the scope, reasons for change, and any anticipated results such as its part on safety, quality, and environment) (attach other sheets if necessary):
 Addition of new circuit breakers to building 34B.

TYPE OF CHANGE (mark all that apply):

<input type="checkbox"/> CHEMICAL INVENTORY	<input type="checkbox"/> DESIGN CODES	<input checked="" type="checkbox"/> ELECTRICAL COMPONENTS / CLASSIFICATIONS	<input type="checkbox"/> EQUIPMENT MODIFICATION / ADDITION / REMOVAL
<input type="checkbox"/> FACILITIES MODIFICATION	<input type="checkbox"/> INSTRUMENTATION / CONTROLS	<input type="checkbox"/> MATERIALS OF CONSTRUCTION	<input type="checkbox"/> PIPING (MANUFACTURER, TYPE, ROUTING)
<input type="checkbox"/> PROCESS / PROCEDURES	<input type="checkbox"/> PROCESS CHEMISTRY	<input type="checkbox"/> PROCESS FLOW	<input type="checkbox"/> RELIEF SYSTEMS
<input type="checkbox"/> SAFE OPERATING LIMITS	<input type="checkbox"/> UTILITIES		

Required Activities (mark all that apply)	Pre-Approval	Pre-Start-up	Post-Start-up	Responsible	Due Date	Completion Date	Completed By (Initials)
<input type="checkbox"/> Process description, chemistry, or inventory	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				
<input type="checkbox"/> Modify process equipment documentation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				

D:\SMALLINKRODT H&S CASE TRACKING\H&S Case Tra | HPSS | ADMIN | 1/21/2004 | 10:31 AM

REPORTS

The Health & Safety system contains reports that are used to summarize the case information and track any outstanding requirements that need to be taken to close out a case. Figure 16 shows the Reports screen and Figure 17 shows an example of a Case Report.

Figure 16. Health & Safety System Report Types.

The screenshot shows a software dialog box titled "Report Type" with several sections for configuring report parameters:

- Report Type:** A list of radio buttons including "Case Report" (selected), "Monthly Near Miss Report", "Outstanding Corrective Actions", "Outstanding Investigations", "General Tracking Report", "Corrective Actions", "MOC Request & Approval", and "Past Due Corrective Actions". Below this is a sub-section for "Injury Reports" with radio buttons for "Injury Type", "Month of Injury", "Accident Type", "Location", "Body Part", "Job Title", "Day of Week", and "Causes".
- Date Range:** Fields for "Start Date" and "End Date", both set to "01/23/2004".
- Case Number:** A dropdown menu labeled "Case Number".
- Destination:** Radio buttons for "Window" (selected) and "Printer".
- Case Type:** A dropdown menu labeled "Case Type" with a checked checkbox for "All Case Types".
- Copies:** A field labeled "# of Copies" with the value "1".
- Responsible Person:** A dropdown menu labeled "Responsible Person" with a checked checkbox for "All People".

Buttons for "Ok" and "Close" are located in the top right corner.

Figure 16. Example of a Screen Preview of a Case Report.

Case Number: PAR04-03-0001

Department MAINTENANCE	Case Date 3/10/2004	Case Time 1:00:00PM
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Exact Location of Incident
Maintenance Shop

Initial Report 3/10/2004 12	Investigation Report NOT Required Investigation Report NOT Filed
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Initiated by Baker, Tim	Audit Type
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Person Accountable for Overall Incident Taylor, Ron	Potential Exposure LOW
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Critical Contact: No	Routine Contact: No	Distribution List: No
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Case Type
NEAR-MISS

Incident Description
Tim was nearly struck by a falling tool box from a table in the maintenance shop.

Severity of Loss SERIOUS	Probability of Occurrence OCCASIONAL	Severity Score 4
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Media Coverage

Media Coverage
NONE

CONCLUSION

Mallinckrodt Baker's Health & Safety system is used at the Paris Kentucky facility to record health and safety incidents, near misses, and management of change activities. The Health & Safety / Incident Tracking System maintains all incident case information in a detailed data entry format that includes location, description, cause, losses, injury / illness, spills and corrective actions. Each incident is also rated on a severity scale and depending on the severity of the incident specific corrective actions are required. The reports produced by the Health & Safety / Incident Tracking System are tabular and graphical detailing case information and corrective action requirements. The system also produces reports of completed and outstanding corrective actions along with the responsible person.

This system has streamlined health & safety and management of change tracking allowing quick and easy access to the information and reports.

KEY WORDS

Health & Safety, EIMS, EMIS, Software, Management Systems, Management of Change, Environmental Data Management