

**EXAMPLES OF COMPLIANCE  
METHODS FOR MONITORING  
AND RECORDKEEPING  
RCRA SUBPARTS BB AND CC**

**Tennessee Operations  
Eastman Chemical Company**

## **Tennessee Operations of Eastman Chemical Company**



**Large Manufacturing Facility that includes the following RCRA Units:**

**Tanks, Containers (including buckets, drums, liquid chemical dumpsters, tank trucks), Incinerators, Surface Impoundments, and Landfill**

This facility manufactures chemicals, plastics and fibers and has more than 6000 units and equipment subject to the monitoring, inspection and recordkeeping requirements of RCRA Subpart BB and CC. Because of the level of detailed records required, a clear compliance method must be available with systems adequate to assure compliance with both routine and non-routine events.

In order to comply with Subpart BB and CC Method 21 monitoring requirements, substantial documentation is required to identify covered equipment, identify the appropriate compliance standard, maintain monitoring records etc. At a facility as large as Eastman, this task is achieved through the use of electronic records, where feasible, and with hard copy records where necessary

## **Key to Compliance is to Develop a System That Has the Following Capabilities:**

- A relational database that allows input of information by equipment type and applicable regulations and that features cross referencing data tables
- The system must reliably track not just for routine events but the exceptions to meet monitoring and recordkeeping requirements
- Develop a monitoring process that can be easily used by operations personnel and that provides scheduling flexibility
- TRAINING, TRAINING, TRAINING

## STEP 1: Component Information Tables

- **Location** - ID by plant, unit, building, area and batch, if applicable, and includes information for first year in operation and number of hours operated per year
- **Component Classes** - End Caps for Open-Ended Lines, Closed Vent system/Control Device, Compressors, Connectors, Pump, Valves, Pressure Relief Device, Sampling System
- **Component Type** - For example, connector flanged, connector screwed, ball valve, gate valve, centrifugal pump, etc.
- **Manufacturer Information** - Tag Code, Manufacturer Name and Model Number, Size and Part Number, Description (i.e. pumps with dual mechanical seals)

## **Component Information Tables (continued)**

- **Component Category**

- Normal monitoring (accessible)
- Difficult to monitor and the reason
- Unsafe to monitor and the reason

- **Chemical Information**

- Chemical CAS number and maximum concentration
- Chemical state (gas/vapor; light liquid; light liquid/gas vapor; heavy liquid)

- **Pressure Service Information**

- Atmospheric pressure
- Positive pressure
- Vacuum service

## **Component Information Tables (continued)**

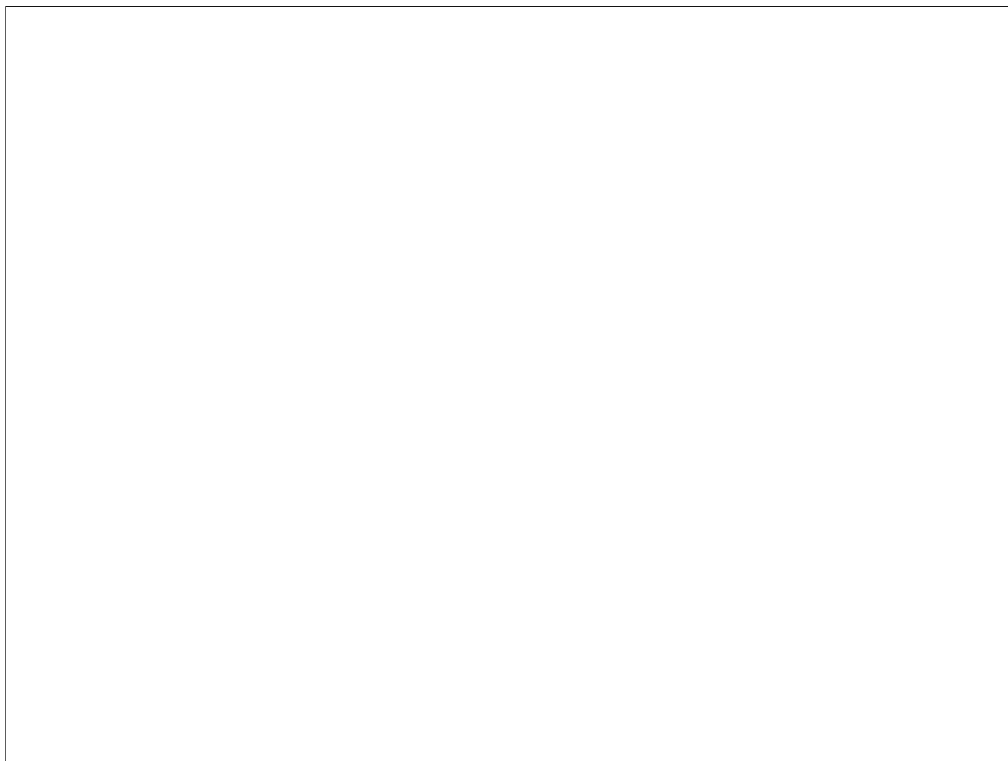
- **Compliance Information**
  - Regulation/Rule Reference (i.e. EPA Subpart BB, CC, HON)
  - Special Designation Maximum Allowed Leak (NDE, DMS)
  - Monitoring frequency - Method 21 (component type, category, description)
  - Other monitoring frequencies (visual inspection, sensor checks, alarm test)
  - Repair Information (# days before initial repair, # days before effective repair)
  - Change to Rule if Leaking (Assign to component the rule name change if the component is found to be leaking)
  - Change to Rule if Passes (Assign to component the rule name change if the component passes inspection)

This information is kept in the facility's database.



## **Step 2: Identify Equipment Locations on Plot Plan**





# EXAMPLES OF EQUIPMENT DESCRIPTIONS

Area/Building: P M D /226						Unit: B-Line		
Drawing: 226-9E-11362						Completed By: _____		
Tag ID	Description	Floor	Equip/ Type	State	Rel. Equip	Size (in)	Category Reason	Process Stream
226136	Valve below the gauge Eastside	H . Steel	Valve	L	BC-01	0.75	Monitor	
226136	Hand valve Eastside	H . Steel	Valve	L	BC-01	1	Monitor	MeOH
226136	Bypass valve North of Meoh column	H . Steel	Valve	L	BC-01	1.5	Monitor	MeOH
226136	Hand valve East of control valve	H . Steel	Valve	L	BC-01	1.5	Monitor	MeOH
226136	Drain hand valve East side below control valve	H . Steel	Valve	L	BC-01	0.75	Monitor	MeOH
226136	Control valve North of Meoh column	H . Steel	Valve	L	BC-01	1.5	Monitor	MeOH
226136	Hand valve West of control valve	H . Steel	Valve	L	BC-01	1.5	Monitor	MeOH
226136	Valve after flow meter	H . Steel	Valve	L	BC-01	1.5	Monitor	MeOH
226136	Drain valve after flow meter	H . Steel	Valve	L	BC-01	0.75	Monitor	MeOH
226136	Valve before flow meter	H . Steel	Valve	L	BC-01	1.5	Monitor	MeOH
226136	Flow meter bypass valve	H . Steel	Valve	L	BC-01	1.5	Monitor	MeOH

## Correlating Drawings, Field Instruments and Monitoring Data

### 3 Methods are currently used

- Each piece of equipment is tagged in the field with a bar code
- Each piece of equipment is identified by location and description in a notebook with the bar code
- The unit is loaded into the hand monitor by “route” and the equipment is monitored in accordance with the established route.

## EXAMPLE OF BAR CODE TAG INFORMATION

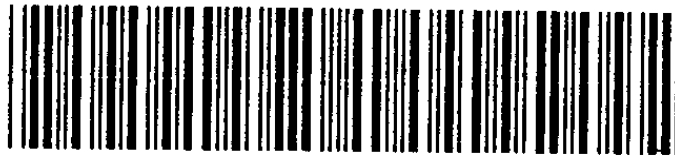
Area: POLY-PMD

DWG# 226-9E-11362

Sub Area: 226

Tag ID: 2261362V02

Desc: VALVE



# EXAMPLES OF BAR CODE SHEETS

Area: POLY-PMD      DWG# 226-9E-11362  
Sub Area: 226  
Tag ID: 2261362V01  
Desc: VALVE



Area: POLY-PMD      DWG# 226-9E-11362  
Sub Area: 226  
Tag ID: 2261362V02  
Desc: VALVE



Area: POLY-PMD      DWG# 226-9E-11362  
Sub Area: 226  
Tag ID: 2261362V03  
Desc: VALVE



Area: POLY-PMD      DWG# 226-9E-11362  
Sub Area: 226  
Tag ID: 2261362V04  
Desc: VALVE



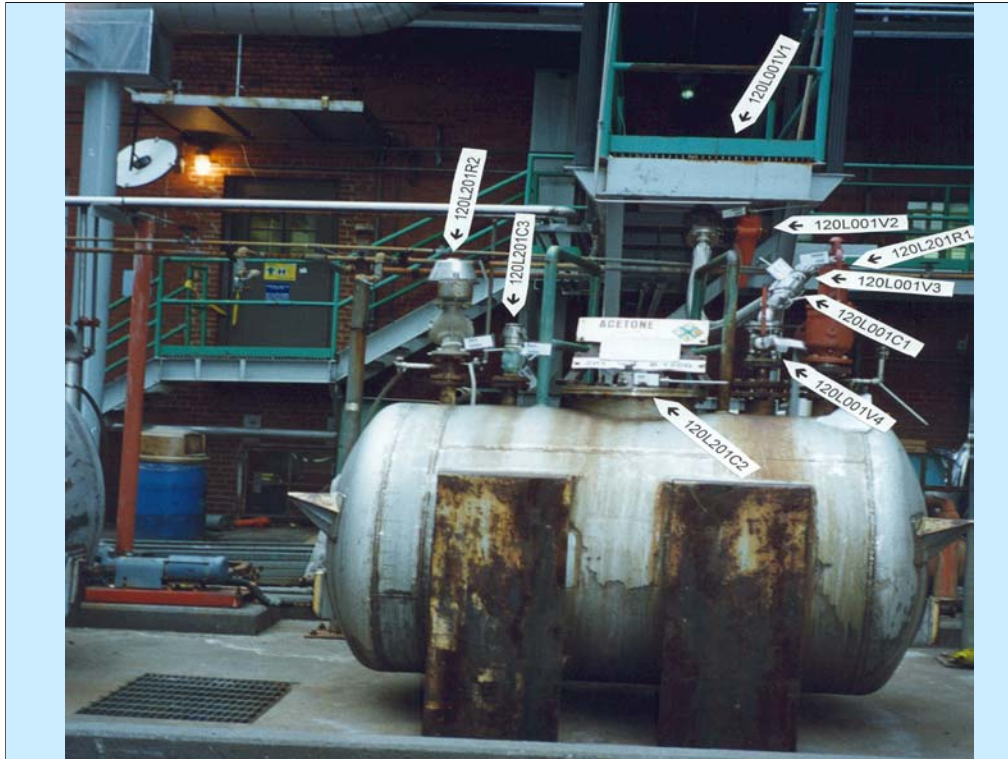
Area: POLY-PMD      DWG# 226-9E-11362  
Sub Area: 226  
Tag ID: 2261362V05  
Desc: VALVE



Area: POLY-PMD      DWG# 226-9E-11362  
Sub Area: 226  
Tag ID: 2261362V06  
Desc: VALVE



Example of barcode sheets used in a separate field notebook.



In addition to identifying the unit on a plot plan, Eastman Chemical also takes a picture and identifies valves, vents, and compressors with a 10 digit identification number.

## **STEP 3: Method 21 Monitoring**

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- **Calibration & Documentation**
- **Identification of Standards to be met**
  - 10,000 ppmv for valves and pumps
  - 500 ppmv for “no detectable emissions (NDE)”
- **Proper Monitoring Techniques**

**SHOW VIDEO HERE**



## **STEP 4: Recordkeeping and Monitoring in the Event of a Leak**

- **Work Request Number and Status (open or closed)**
- **First Attempt Due Date (5 days)**
- **Effective Repair Due Date (15 days)**
- **Status**
  - **Repair completed (date, time, repaired by)**
  - **Delayed for shutdown (must last no longer than 180 days if the component will contact 10% or greater VO)**
  - **Delayed repair, reasons and documentation**
  - **Unrepairable**
- **Data on retest confirming completion of repair**
- **Alternate monitoring schedule**

Facility follows OSHA 1910 requirements, therefore, they inspect equipment more often than required under Subpart BB.

High VO emissions could trigger OSHA or fire regulations before Subpart BB regulations would require leak repair.

## **Data Retrieval**

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- **Data can be obtained from the history files by area, building, unit, equipment identification number or any number of options.**
- **All equipment measurements are maintained in the system for a minimum of three years.**

## **EXAMPLES OF HARD COPY DOCUMENTATION**

- **Tank vapor pressure determinations**
- **Heavy liquid service vs. light liquid service for containers**
- **Method 27 markings for inspectors**
- **300 hour BB exemption requires a demonstration that all lines are purged after use.**

**B-137 – TANK 401**

**REGULATION: Subpart CC, Level 1 Tank**

**POINTS TO MONITOR (TAG ID #s): 137T401R1, 137T401R2**

**MONITORING – NDE**

**REQUIREMENTS – Emergency relief device and conservation vent allowed with no control device with NDE demonstration**

**LEVEL 1 DEMONSTRATION**

**Requirements – Maximum organic vapor pressure must be less than 11.12 psi for tanks with capacity less than 20,000 gallons**

**Monitoring – Annual visual inspection (every 12 months), confirm with Method 21 determination annually, calculations showing vapor pressure determination must be documented, Storage Tank Description must be maintained.**

**Tank ID Number: D-401**

Diameter: 10 ft.      Height: 16 ft.      Capacity: 10,000 gal.  
Vertical Tank      Fixed Roof      Nitrogen Blanket 16 psia  
Loading Type: Submerged

<u>Component</u>	<u>Weight Percent</u>	<u>Pure Component Vapor Pressure (psia) @ 94°F*</u>
Acetone	67	6.5139
Isopropyl acetate	1.5	1.808
Isopropyl alcohol	0.5	1.4453
Water	24	0.7817
Propionaldehyde	7	8.9022

Assume 100% propionaldehyde VP = 8.9022 psia <11.2 psia

\*Maximum average high temperatures (June - July) 87°F

## **B-55 – Liquid Chemical Dumpster 551**

**REGULATION:** Subpart CC, Level 1 Container

**POINTS TO MONITOR (TAG ID #s):** 55D551R1, 55D551R2

**MONITORING – Visual Inspection**

**REQUIREMENTS – All openings closed except during filling, emptying, sample collection etc.**

**SIZE:** 500 gallons

**OPERATING CONDITIONS:** Nitrogen blanket

**CONTENTS:** Iso-butyric anhydride 100% by weight

Vapor pressure at 20°C is 0.0782 kPa < 0.3 kPa

No other organic components other than iso-butyric anhydride are present in the iso-butyric anhydride sludge at a level of 20% or more by weight. Container is in heavy liquid service.

Provide Environmental Management Information System documentation as required.

## Demonstration of Method 27 Testing Conducted by Certified Offsite Facility



**EQUIPMENT ID**  
**137L002VI, 137L002V2 - TANK 401 to B83**

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- **EXEMPTION** - Subpart BB, Equipment in Infrequent Use
- **REQUIREMENTS** - Equipment in use less than 300 hrs/yr
- **MONITORING** - No monitoring requirements, list of equipment must be maintained in records, equipment must be purged with nitrogen after use.
- **CALCULATIONS:** Frequency at which Tank 401 pumps to B-83 = Every 60 days (6 times annually at full production)
  - Average time required to empty tank = 14 hours
  - Annual hours in use = 14 hours X 6 (times annually) = 84 hours
  - See attached B-83 BIF unit disposal history data for confirmation



## **CONCLUSIONS**

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- **Compliance with the monitoring requirements of Subparts BB and CC is labor and paperwork intensive.**
- **Inspection monitoring and recordkeeping systems must be capable of handling the exception as well as the routine.**
- **Maintenance of calibration records and adequate training of monitoring personnel is critical.**