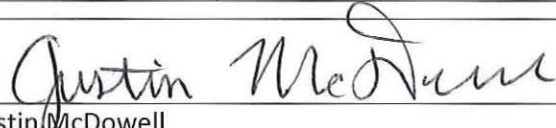


**Region 6 Compliance Assurance and Enforcement Division
INSPECTION REPORT**

Inspection Date(s):	October 11-13, 2017		
Media:	Air		
Regulatory Program(s)	Clean Air Act Section 112(r) and 40 C.F.R. Part 68 Chemical Accident Prevention Provisions (Risk Management Program)		
Company Name:	Arkema Inc.		
Facility Name:	Arkema Inc. – Houston Plant		
Facility Physical Location:	2231 Haden Road		
(city, state, zip code)	Houston, Texas		
Mailing address:	2231 Haden Road		
(city, state, zip code)	Houston, Texas		
County/Parish:	Harris		
Facility Contact:	Rick Brown	Plant Manager	
	rick.brown@arkema.com		
FRS Number:	110056638526		
Identification/Permit Number:	Air Operating Permit ID: O1551		
Media Number:	EPA Facility Identifier: 1000 0008 0921		
NAICS:	325199 (All Other Basic Organic Chemical Manufacturing)		
Personnel participating in inspection:			
Justin McDowell	US EPA	Inspector	214-665-6557
Rick Brown	Arkema	Plant Manager	713-455-1211
Paul Shelton	Arkema	HES Manager	713-455-1211
Wesley Carter	Arkema	Process Safety Risk Engineer	713-455-1211
Doug Loose Jr.	Arkema	Maintenance/ Engineering Manager	713-455-1211
Mark Diamond	Arkema	Environmental Engineer	713-455-1211
Didier Auber	Arkema	Regional Director of Manufacturing	713-455-1211
Colette Spicer	Arkema	Process Engineer	713-455-1211
Dillard Meadows	Arkema	Plant Manager	713-455-1211
EPA Lead Inspector Signature/Date	 Justin McDowell		11/28/17 Date
Supervisor Signature/Date	 Samuel Tate		11/28/2017 Date

Section I – INTRODUCTION

PURPOSE OF THE INSPECTION

The United States Environmental Protection Agency (EPA) Region 6 inspector, Justin McDowell, arrived at the Arkema Inc. Houston (Arkema Houston) plant at 9:00 AM on Wednesday October 11, 2017 for an announced inspection. I, Justin McDowell, met with Rick Brown (Plant Manager), Paul Shelton (Health and Environmental Safety Manager), Wesley Carter (Process Safety Risk Engineer), Mark Diamond (Environmental Engineer), and Doug Loose Jr. (Maintenance and Engineering Manager) for an opening meeting. I presented my credentials and informed Arkema Houston personnel that this was an EPA inspection to determine compliance with the facility's Chemical Accident Prevention Program. The scope of the inspection was a partial compliance evaluation (PCE), which included an evaluation of the facility's compliance with the Clean Air Act (CAA) Section 112(r) and the Chemical Accident Prevention Provisions in 40 C.F.R. Part 68. Arkema Houston's Risk Management Program (RMP) is listed as a Program three (3) facility. I inquired if an employee representative(s) was available to participate in this inspection and was informed that Arkema Houston is a non-union facility.

Table 1: Opening Meeting Attendance, Wednesday October 11, 2017

NAME	POSITION
Rick Brown	Plant Manager
Paul Shelton	Health and Environmental Safety Manager
Wesley Carter	Process Safety Risk Engineer
Mark Diamond	Environmental Engineer
Doug Loose Jr.	Maintenance and Engineering Manager
Justin McDowell	EPA

FACILITY DESCRIPTION

"The Arkema Houston facility manufactures mercaptans and sulfides. Two substances used and produced within the facility are regulated substances under 40 CFR 68, the EPA Risk Management Program (RMP) rule, specifically hydrogen sulfide (H₂S) and carbon disulfide (CS₂). These substances are present at or above the minimum threshold for RMP applicability. Hydrogen sulfide is manufactured onsite and is a raw material to produce mercaptans. Carbon disulfide is a product produced onsite. Both are listed toxic substances. These linear and tertiary mercaptans and carbon disulfide are used in the production of insecticides, herbicides, fungicides, polymers, latex, synthetic rubber, plastics and corrosion inhibitors."- Arkema. Arkema Houston has manned productions in three shifts to cover 24 hours a day. Arkema has approximately 71 staff personnel, including 64 Arkema and 7 nested contractors.

Section II – OBSERVATIONS

On Thursday October 12, 2017, I conducted a walk-through of the facility accompanied by Rick Brown to observe all process areas, the control room, laboratory, and rail yard. Prior to the tour, I was provided a facility safety orientation.

Subpart A – General

40 C.F.R. § 68.10 Applicability- Arkema Houston is the owner or operator of a stationary source that has more than a threshold quantity of regulated toxic substances, listed in 40 C.F.R. § 68.130, in a process and is subject to the Chemical Accident Prevention Provisions. Arkema Houston has a Clean Air Act (CAA) Title V permit and Air Operating Permit ID O1551 for their Basic Organic Chemical Manufacturing process (NAICS code 325199). Arkema Houston is subject to the Occupational Safety and Health Administration (OSHA) process safety management standard, 29 C.F.R. § 1910.119, and has four Program Level 3 processes.

40 C.F.R. § 68.12 General requirements- Arkema Houston submitted a RMP five-year update on March 17, 2016. This submittal listed four (4) covered processes containing two regulated toxic chemicals (hydrogen sulfide and carbon disulfide). This requires the facility to develop and implement a management system, conduct a hazard assessment, implement the prevention requirements of 40 C.F.R. § 68.65 - § 68.87, develop and implement an emergency response program, and submit the data element form 40 C.F.R. § 68.175 in their RMP.

40 C.F.R. § 68.15 Management- Arkema Houston developed a management system to oversee the implementation of the RMP elements. The current RMP re-submission lists outgoing Plant Manager Dillard Meadows, as being assigned the overall responsibility for the RMP elements. I mentioned to site personnel to include appropriate personnel within their RMP organizational chart.

Subpart B – Hazard Assessment

40 C.F.R. § 68.20 Applicability- Arkema Houston is a Program 3 stationary source subject to this subpart. The facility is required to prepare an offsite consequence analysis and complete the five-year accident history.

40 C.F.R. § 68.22 Offsite Consequence Analysis Parameters- I requested and reviewed documentation on Arkema's offsite consequence analysis and supporting documentation. Arkema Houston's modeling scenarios were conducted using RMP*Comp™.

40 C.F.R. § 68.25 Worst-case Release Scenario Analysis- Arkema Houston identified and documented a worst-case release scenario analysis for their RMP covered toxic substance. The distance to endpoint for the worst-case scenario analysis was calculated using RMP*Comp™.

40 C.F.R. § 68.28 Alternative Release Scenario Analysis- Arkema Houston identified and analyzed at least one alternative release scenario for their regulated toxic substances. This scenario was

documented and was based on a greater likelihood of occurrence. The distance to endpoint for the alternative case scenario analysis was calculated using RMP*Comp™.

40 C.F.R. § 68.30 Defining Offsite Impacts - Population- Arkema Houston's offsite consequence analysis documented the methodology for both worst-case and alternative case release scenarios. The current census (2010) was used in the methodology. However, the presence of institutions, parks and recreational areas, major commercial, office, and industrial buildings were not identified in their RMP. While on-site, Arkema personnel created and provided me with Mapping Application for Response, Planning and Local Operational Tasks (MARPLOT) documentation that represented each release scenario with the radius potentially impacted.

40 C.F.R. § 68.33 Defining Offsite Impacts - Environment- At the time requested, Arkema Houston did not have any MARPLOT maps to identify the potential offsite impacts and identify public and environmental receptors within the calculated distance to endpoints of their release scenarios. Arkema Houston created documentation while I was onsite that depicted the radius of the release scenarios but did not have a general breakdown of both public and environmental receptors potentially impacted.

40 C.F.R. § 68.36 Review and Update- I reviewed Arkema Houston's documentation that illustrates the offsite consequence analyses reviews, and updates occur at least every five years. Arkema Houston personnel reported that there have not been any increases to process chemicals and that there have been no process changes to the quantities stored or handled that would require changes to their offsite consequence analysis data.

40 C.F.R. § 68.39 Documentation- I reviewed all documentation for offsite consequence analysis presented onsite and subsequent to the inspection. For the worst-case and alternative case scenarios, a description of the vessel or pipeline, the substance selected as worst-case, and the rationale for selection was included; likewise, assumptions included use of any administrative controls and any passive mitigation that were assumed to limit the quantity that could be released, estimated quantity released, release rate, and duration of release. The methodology used to determine distance to endpoint was documented by the facility. When requested, Arkema Houston did not have any data used to estimate public or environmental receptors in the form of maps that had the distance to endpoint labeled with a circle from the emissions point.

40 C.F.R. § 68.42 Five-year accident history- Arkema Houston reported one accidental gas release in their RMP on September 19, 2014, which involved an H₂S release from an air coil. This 15-minute release resulted in a neighboring facility to shelter in place. The incident was corrected by conducting an engineering review on impacted piping and replacing piping to a different schedule.

Subpart D – Program 3 Prevention Program

40 C.F.R. § 68.65 Process Safety Information- I reviewed the Arkema Houston's procedure for process safety information (PSI). I selected a group of the facility's PSI related to their RMP units for review. I reviewed the piping and instrumentation diagrams (P&IDs) for regulated chemicals to verify the PSI contained in the hazard information for each substance. I was provided with process chemistry, flow diagrams, maximum intended inventory data, consequences of deviation, and safe upper and lower limits for temperatures, pressures, flows, and compositions. This data was seen visually during the site tour in the control room. The facility did have certain P&IDs that were not updated due to ongoing and completed management of changes (MOCs).

40 C.F.R. § 68.67 Process hazard analysis (PHA) – I reviewed Arkema Houston's PHA procedure and process. The facility uses a staggered schedule to conduct PHAs on process units. They use a Hazard and Operability Study (HAZOP) and Layer of Protection Analysis (LOPA) combination for PHAs. The facility uses an IMPACT system to address the PHA team's findings and recommendations, assure the recommendations are resolved in a timely manner, and documented. For the PHA titled "Systematic Analysis of the 180 – H₂S and CS₂ Process", the last PHA was completed on July 18, 2012. The next PHA would be due by July 18, 2017. Arkema Houston began the PHA session on April 10, 2017, and created a PHA draft document; however, that draft had not become final at the time of the inspection. Arkema Houston personnel stated that the IMPACT system will not allow closing of a PHA until all action items are addressed.

40 C.F.R. § 68.69 Operating Procedures- I requested and reviewed operating procedures for operations related to Arkema Houston's RMP process units. Arkema Houston's operating procedures are kept on their internal server and a hard copy is maintained inside the control room to assure they are readily accessible to employees involved in their RMP processes. While reviewing Arkema Houston's annual operating procedure certifications for the 180 Unit, the dates were as follows: April 4, 2014, January 28, 2015, February 3, 2016, and February 6, 2017. For the 196 Unit the certifications were as follows: August 26, 2014, January 28, 2015, February 3, 2016, and February 6, 2017. The 293 Unit had the following certification dates: April 23, 2014, January 28, 2015, February 3, 2016, and February 6, 2017. There were several certifications that had passed the annual (365 day) deadline.

40 C.F.R. § 68.71 Training- I discussed with Arkema Houston their training program and procedures. The facility uses a 3rd party software to track training. I discussed the process for training of new employees and the process to ensure that the three-year refresher training requirements are met. I requested training files for six operators at various experience levels. Of the six operator files reviewed, I found that four (4) employees did not have the refresher training to meet the requirements of this part. All mechanical integrity training is conducted by OSHA. Arkema Houston did not provide training documentation that verified that they employees understood the training. The record only included the title of training given, date, and attendance.

40 C.F.R. § 68.73 Mechanical Integrity- I requested and was provided mechanical integrity records for randomly selected inspections of RMP covered equipment, equipment associated with their offsite consequence analysis documentation, and the written procedure for maintaining the on-going integrity

of the process. Arkema Houston is currently in the process of implementing risk based inspections on various equipment. Arkema Houston's inspection records for equipment 80-01-16 is currently pending and was due for inspection October 2016. The last inspection was conducted in July 2012. While reviewing inspection record files for equipment 80-01-16 and various piping records, the date of the inspection or test was not identified on the document.

40 C.F.R. § 68.75 Management of Change (MOC) – I reviewed Arkema Houston's written procedure for MOCs. I reviewed the revised MOC from December 8, 2015. I inquired about a possible MOC for the pipe replacement after the September 19, 2014, accident recorded in § 68.42 (five-year accident history). Arkema personnel explained that a MOC was not created for this change. Years prior to the accident, an operator installed a thicker schedule pipe under the assumption that the thicker pipe would be better; however, this thicker pipe caused erosion, which led the facility to return to the original pipe specifications for the corrective action.

40 C.F.R. § 68.77 Pre-startup Safety Review- Arkema Houston provided procedures and documentation for pre-startup safety review prior to the introduction of newly regulated substances.

40 C.F.R. § 68.79 Compliance Audits- I reviewed Arkema Houston's two most recent compliance audits from December 10-14, 2012, and September 28, 2015 - October 2, 2015. At the completion of a compliance audit, the facility addressed each action item during bi-monthly meetings. Arkema Houston had one on-going action item finding (286822) that was due to be addressed on March 1, 2016.

40 C.F.R. § 68.81 Incident Investigation- I requested a list of incident reports/ investigations for all incidents which resulted in, or could reasonably have resulted in, a catastrophic release of a regulated substance of the last five years pertaining to this subpart. After reviewing incident investigations, investigations: 95941 (crane securing incident), which occurred on August 2, 2017, I observed that the investigation began on August 7, 2017; 95733 (H2S Monitor goes off), which occurred on July 21, 2017, I observed that the investigation began on July 25, 2017; and 96968 (Mechanic was inside of cooling tower fan cell setting fan in place), which occurred on November 9, 2016, I observed that the and investigation began on October 11, 2017. All incidents investigations are required to start no more than 48 hours following the incident.

40 C.F.R. § 68.83 Employee Participation – I reviewed Arkema Houston's written documentation regarding employee participation and its implementation in their RMP, which met this subpart.

40 C.F.R. § 68.85 Hot Work Permit- I requested and reviewed four (4) safe work/ hot work permits. The permits reviewed met the requirements of this subpart.

40 C.F.R. § 68.87 Contractors- I discussed with Arkema Houston the selection process of contractors, which are granted authority to perform work onsite. The facility uses a 3rd party website as their primary source to vet and select contractors to work onsite. All contractors selected through this process have requirements that are to be met for submission and are trained via the Houston Area Safety Council. Once selected and onsite, Arkema Houston will then issue their site permit, badge for controlled entry, and administer site specific safety information.

Subpart E – Emergency Response

40 C.F.R. § 68.90 Applicability- Arkema Houston’s employees are first responders that respond to both structural fires and chemical fires and releases onsite. Each member receives fire, hazmat, and emergency rescue training from an accredited facility. They are also required to maintain annual refresher trainings.

40 C.F.R. § 68.95 Emergency Response Program- I reviewed Arkema Houston’s Emergency Response Plan. The facility reported the use of an e-notify incident reporter system to notify area Local Emergency Planning Committees (LEPCs), municipalities, Channel Industries Mutual Aid (CIMA), and neighboring facilities of emergencies. Arkema Houston also reported monthly meetings with CIMA and periodically conducts drills to ensure proper preparedness in the event of an emergency. Arkema Houston also actively participates in the LEPC and is active with both the East Harris County Manufacturers Association (EHCMA) and American Chemistry Council (ACC). While conducting the facility tour, I noted 3 fire extinguishers that were not marked (punched) as being current for monthly inspections.

Subpart G – Risk Management Plan

40 C.F.R. § 68.190 Updates- Arkema Houston’s RMP was re-submitted on March 17, 2016, as required by this subpart.

40 C.F.R. § 68.195 Required corrections – Arkema Houston’s next RMP re-submission is due by March 17, 2021, unless an update or correction is required by 40 CFR 68.190 and 40 CFR 68.195.

Closing Meeting- A closing meeting was held on Friday October 13, 2017 to discuss the areas of concern, recommendations, additional documents requested, and the process of completing the inspection report.

Table 2: Closing Meeting Attendance, Friday October 13, 2017

NAME	POSITION
Rick Brown	Plant Manager
Paul Shelton	HES Manager
Mark Diamond	Environmental Engineer
Doug Loose Jr.	Maintenance and Engineering Manager
Didier Auber	Arkema Staff
Dillard Meadows	Plant Manager
Kim Knotts	Arkema Staff
Harry Yekel	Arkema Staff
Jean-Marie Cencetti	Arkema Staff
Sue Lee-Martin	Arkema Staff
Jorae Mitchell	Arkema Staff
Eric Tilles	Arkema Staff
Justin McDowell	EPA

Section III – AREAS OF CONCERN

AOC 1 – 40 C.F.R. § 68.39 (e) Hazard Assessment: Documentation

“(e) Data used to estimate population and environmental receptors potentially affected.”

Arkema Houston did not have documentation to represent estimate public receptors or environmental receptors potentially affected. Arkema Houston did not provide at the time of the inspection any data used to estimate public or environmental receptors in the form of maps that had the distance to endpoint labeled with a circle from the emissions point. Arkema Houston could not verify the potential population impacted while designing its hazard assessment for either worse-case or alternative release scenario analysis. The presence of institutions, parks and recreational areas, major commercial, office and industrial buildings were not identified in their RMP. While onsite, Arkema personnel created and provided me with MARPLOT documentation that represented each release scenario with the radius potentially impacted.

AOC 2 – 40 C.F.R. § 68.65 (d)(1)(ii) Safety Information

“(d) Information pertaining to the equipment in the process. (1) Information pertaining to the equipment of the process shall include: (ii) Piping and instrument diagrams (P&ID’s)”

The facility had certain P&IDs that were not updated and associated with ongoing and completed MOCs.

AOC 3 – 40 C.F.R. § 68.69 (c) Operating Procedures

“The operating procedures shall be reviewed as often as necessary to assure that they reflect current operating practice, including changes that result from changes in process chemicals, technology, and equipment, and changes to stationary sources. The owner or operator shall certify annually that these operating procedures are current and accurate.”

While reviewing Arkema Houston’s annual operating procedure certifications for the 180 unit the dates were as follows: April 4, 2014, January 28, 2015, February 3, 2016 and February 6, 2017. For the 196 unit, the certifications were as follows: August 26, 2014, January 28, 2015, February 3, 2016 and February 6, 2017. The 293 unit had the following certification dates: April 23, 2014, January 28, 2015, February 3, 2016 and February 6, 2017. There were several certifications that had passed the annual (365 day) deadline.

AOC 4 – 40 C.F.R. § 68.71 (b) Training

“*Refresher training.* Refresher training shall be provided at least every three years, and more often if necessary, to each employee involved in operating a process to assure that the employee understands and adheres to the current operating procedures of the process. The owner or operator, in consultation with the employees involved in operating the process, shall determine the appropriate frequency of refresher training.”

I requested training files for six operators at various experience levels. Of the six operators' files reviewed, I found that 4 employees did not have the refresher training to meet the requirements of this part.

AOC 5 – 40 C.F.R. § 68.71 (c) Training

“Training documentation. The owner or operator shall ascertain that each employee involved in operating a process has received and understood the training required by this paragraph. The owner or operator shall prepare a record which contains the identity of the employee, the date of training, and the means used to verify that the employee understood the training.”

Arkema Houston did not provide training documentation that verified that their employees understood the training. The training records only consisted of the title of training given, date and attendance.

AOC 6 – 40 C.F.R. § 68.73 (d)(4) Mechanical Integrity

“(d)(4) The owner or operator shall document each inspection and test that has been performed on process equipment. The documentation shall identify the date of the inspection or test, the name of the person who performed the inspection or test, the serial number or other identifier of the equipment on which the inspection or test was performed, a description of the inspection or test performed, and the results of the inspection or test.”

For the equipment 80-01-16 and various piping equipment, the date was not documented on the performed inspection.

AOC 7 – 40 C.F.R. § 68.73 (f)(2) Mechanical Integrity

“(f) Quality assurance. (2) Appropriate checks and inspections shall be performed to assure that equipment is installed properly and consistent with design specifications and the manufacturer's instructions.”

Arkema Houston made a pipe replacement after the September 19, 2014 accident recorded in § 68.42 (Five-year accident history). Arkema personnel explained that an MOC was not created for this change. Years prior to the accident, an operator installed a thicker schedule pipe under the assumption that the thicker pipe would be better, but this thicker pipe caused erosion leading the facility to return to the original pipe specs for the corrective action.

AOC 8 – 40 C.F.R. § 68.79 (d) Compliance Audits

“(d) The owner or operator shall promptly determine and document an appropriate response to each of the findings of the compliance audit, and document that deficiencies have been corrected.”

Arkema Houston has one on-going action item finding (286822) that was due to be address March 1, 2016.

AOC 9 – 40 C.F.R. § 68.81 (b) Incident Investigation

“(b) An incident investigation shall be initiated as promptly as possible, but not later than 48 hours following the incident.”

After reviewing incident investigations, investigation 95941 (Crane Securing Incident) which occurred on August 2, 2017 and investigation began on August 7, 2017 had a start date more than 48 hours following the incident.

AOC 10 – 40 C.F.R. § 68.95 (a)(2) Emergency Response

“(a) The owner or operator shall develop and implement an emergency response program for the purpose of protecting public health and the environment. Such program shall include the following elements: (2) Procedures for the use of emergency response equipment and for its inspection, testing, and maintenance;”

Arkema Houston had three (3) fire extinguishers in which the inspection cards were not punched on dates corresponding with inspections.

Section IV – FOLLOW UP

The following Confidential Business Information (CBI), claimed by Arkema Houston, was requested on Friday October 20, 2017 and received on Tuesday November 7, 2017. All documents were supplemental to the October 11-13, 2017 CAA 112(r) RMP Inspection.

1. Incident investigation (68.42) for September 19, 2014 Accident.
2. Incident investigations 68.81 (near misses) 2015 to present including investigations.
3. All Hazard Assessment documentation for both worst case and alternative case scenarios.
4. List of P&IDs that are pending update until completion of open Management of Changes.
5. Inspection records for 80-01-16.
6. List of open PHA action items.
7. Training records for six employees from 2012 to present.
8. Operation Procedure Certifications for process units from 2014 to 2017.
9. List of Management of Changes that are open and MOCs 301293, 292765, 269033 and 181104.
10. Inspection Records for 80-01-1 thru 80-01-26 and piping records and for mercaptan related equipment.
11. Purchase orders for hose replacements from 2014 to present.
12. List of Compliance Audit open action items and completion dates.
13. Emergency Response Plan.

The facility also provided the following onsite on October 12, 2017:

- 1 Process Safety and Risk Management Audit December 10-14, 2012
- 2 Process Safety and Risk Management Audit September 28-October 2, 2015
- 3 Staff Anniversaries (4 pages)
4. Process Chemistry (4 pages)
5. Piping Material Specifications (58 pages)
6. Process Chemicals (4 pages)
7. 197 Operator Qualification Questions
8. 197 Operator Certification Checklist
9. Safety Data Sheets Chemicals List (9 pages)
10. PHA of the 180 Unit Process: July 17, 2012
11. Systematic Analysis of the 180: July 17, 2017
12. Tank Car Loading/ Unloading Certification
13. Hazard Assessment Maps (3 pages)
14. Safety Data Sheets: Carbon Disulfide (14 pages)
15. Flow Diagrams (4 pages)

Section V – LIST OF APPENDICES

N/A