

Region 6 - Enforcement & Compliance Assurance Division
INSPECTION REPORT

Inspection Date(s):	March 27-31, 2023 and September 25-28, 2023		
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 (RMP)		
Company Name:	Rubicon LLC		
Facility Name:	Rubicon LLC		
Facility Physical Location:	9156 Highway 75		
(city, state, zip code)	Geismar, Louisiana 70734		
Mailing address:	9156 Highway 75		
(city, state, zip code)	Geismar, Louisiana 70734		
County/Parish:	Ascension Parish		
Facility Contact:	Michelle Eaglin	Environmental Engineer Manager	
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FRS Number:	110000597373		
Identification/Permit Number:	1000056599 (EPA Facility Identifier) Air Operating Permit, No. 2391-V15		
NAICS:	325199 (All Other Basic Organic Chemical Manufacturing)		
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	Howard Cole		Date
Supervisor Signature/Date			
	Samuel Tates		Date

SECTION I – INTRODUCTION

I, United States Environmental Protection Agency (EPA) Region 6 Inspector Howard Cole, visited the Rubicon LLC, (Rubicon) facility in Geismar, La. from March 27-31, 2023 and September 25-28, 2023. I met with Michelle Eaglin (Environmental Engineer Manager), Ron Miller (Environmental Engineer), and Seth Arceneaux (Health and Safety Manager) for an opening meeting. Ashley Suarez, Jaimie Vicknair, and Glen Jenkins from the Louisiana Department of Environmental Quality (LDEQ) Chemical Accident Prevention Program participated in the March inspection in Geismar, LA.

I presented my credentials and informed Rubicon personnel that this was an EPA inspection to determine compliance with the federal 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. Rubicon's Risk Management Plan (RMP) is listed as a Program Level 3, Title V process facility. I inquired if an employee representative was available pursuant to section 112(r)(6)(L) of the CAA to participate in this inspection and was informed that the Rubicon Plant is a non-union facility.

FACILITY DESCRIPTION

Rubicon is located at 9156 Highway 75 in Geismar, Louisiana 70734. The facility description given for this report is derived from information directly conveyed by the company. Rubicon employs approximately 600 employees. Rubicon manufactures chemicals that produce 3 main products: Polyurethanes, Antioxidant Additives, and Maleic Anhydride. One of Rubicon's joint venture partners is Huntsman International, LLC, a wholly owned subsidiary of the Huntsman Corporation.

These products have a wide variety of commercial uses including automotive, marine, building materials, appliances, footwear, and sporting goods. Rubicon operates 24 hours a day, 7 days a week. Rubicon uses 6 regulated chemicals above the Risk Management Program (RMP) threshold in its chemical manufacturing processes.

SECTION II - OBSERVATIONS

On Thursday, September 28, 2023, I, accompanied by Seth Arceneaux, conducted a tour of MDI-3 Unit. At the time of the walkthrough the MDI-2 Unit was preparing for a shutdown to start the weekend of September 30, 2023.

Incident: On January 15, 2022 an incident occurred in the MDI-1 Unit. During an upset event on the MDI-1 Dechlorination Column system, the column's rupture disc (PSE-207) activated, resulting in a loss of primary containment of approximately 200 lbs. of 400 °F methylene diisocyanate (MDI). The hot MDI discharged through the relief vent system and into an area on the ground floor where 2 contract craftsmen were working to replace a spare pump (PP4800A). Their maintenance work was unrelated to the column release. The craftsmen experienced second degree thermal burns from exposure to hot MDI. They were sent to onsite medical and subsequently transported to the local hospital for treatment, where both were admitted.

Subpart A - General

40 C.F.R. § 68.10 Applicability – Rubicon is the owner/operator of a stationary source that has more than a threshold quantity of 6 regulated toxic substances in a process (propylene oxide, chlorine, phosgene, formaldehyde, ammonia, and ethylene oxide), as listed in 40 C.F.R. § 68.130, and as such is subject to the

provisions of the Chemical Accident Prevention Provisions requirements. Rubicon has a Clean Air Act (CAA) Title V Air Operating Permit, No. 2391-V15 and a North American Industry Classification System (NAICS) code of 325199-Basic Organic Chemical Manufacturing. Rubicon also is subject to the Occupational Safety and Health Administration (OSHA) Process Safety Management Standard (PSM) 29 C.F.R. § 1910.119 and is an EPA RMP Program Level 3 facility.

40 C.F.R. § 68.12 General requirements – Rubicon resubmitted their 5-year updated Risk Management Plan, as required by 40 C.F.R. 68.190(b)(1), on March 23, 2023. This resubmission listed 6 covered processes containing 6 regulated toxic chemicals. This requires Rubicon to implement the program requirements of 40 C.F.R. § 68.65 - 68.87, develop and implement an emergency response program, and submit the data elements from 40 C.F.R. § 68.175.

40 C.F.R. § 68.15 Management – Rubicon has developed a management system to oversee the implementation of the Risk Management Program elements, has documented persons responsible for implementing the individual requirements of the Risk Management Program, and has defined the lines of authority via an organizational chart. Rubicon lists the General Manager, Mark Dearman, as the qualified person/position that has the overall responsibility for the development, implementation, and integration of the RMP elements. Mr. Dearman was present at the opening conference but did not participate in the inspection.

Subpart B - Hazard Assessment

40 C.F.R. § 68.20 Applicability – Rubicon has 6 Program Level 3 Processes stationary subject to this subpart. Rubicon is required to prepare an offsite consequence analysis and complete the 5-year accident history. The offsite consequence analysis included phosgene, chlorine, formaldehyde, ethylene oxide, ammonia, and propylene oxide.

40 C.F.R. § 68.22 Offsite Consequence Analysis Parameters – I reviewed Rubicon's offsite consequence analysis and supporting documentation. Rubicon used appropriate wind speeds and stability classes, ambient temperatures and humidity values, values for height of the release, and surface roughness values for the release scenario analyses. These values are within parameters specified by EPA for the regulated toxic chemicals. Rubicon uses "PHAST 8.6" as the technique for modeling the release scenarios.

40 C.F.R. § 68.25 Worst-case Release Scenario Analysis – Rubicon analyzed and reported in the RMP one worst-case scenario, estimated to create the greatest distance to an endpoint from an accidental release of a regulated toxic substance from a covered process under worst-case conditions. This was determined by analyzing all regulated toxic chemicals and choosing the chemical with the greatest distance to endpoint.

40 C.F.R. § 68.28 Alternative Release Scenario Analysis – Rubicon identified and analyzed at least one alternative release scenario for each regulated toxic substance stored in a covered process, using a scenario that is more likely to occur, and which will reach an endpoint offsite.

40 C.F.R. § 68.30 Defining Offsite Impacts - Population – Rubicon's offsite impacts documentation did identify the presence of institutions, parks, and recreational areas, major commercial, offices, and industrial buildings in the RMP. The maps provided did identify receptors within a circle. The original RMP hazard assessment documentation provided during the 2019 RMP inspection included the distance to endpoint based on a circle with the release point at the center but did not detail the number or type of impacted receptors. This data also was not found in the 2016 RMP update.

40 C.F.R. § 68.33 Defining Offsite Impacts - Environment – Rubicon's offsite impacts documentation did identify the presence of affected environmental receptors.

40 C.F.R. § 68.36 Review and Update – Rubicon's most recent offsite consequence analyses were completed in March 2023 during the last RMP resubmission. Rubicon ensures that this documentation is reviewed and updated at least once every five years.

40 C.F.R. § 68.39 Documentation – For the worst-case and alternate release 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 "PHA 8.6" methodology was used to determine distance to endpoint. RMP*Comp™ was used to verify the distance to endpoint for each scenario.

40 C.F.R. § 68.42(a) & 68.168 Five-year accident history — Rubicon reported one accident from a covered process within the last five years in their March 23, 2023, Risk Management Plan re-submission. On September 22, 2022, a release occurred during a maintenance activity in the MDI-2 unit. Approximately two pounds of a liquid mixture of aniline, formaldehyde, and hydrochloric acid (HCl) was released to a secondary containment. A contractor was injured as a result of exposure to the chemicals while performing duties as the "hot zone" attendant.

Rubicon failed to include in their 5-year accident history a chemical release from a covered process, which occurred on January 15, 2022. There were 2 contractor employees injured during an upset event in the MDI-1, Dechlorination Column system. When the column's rupture disk activated, it resulted in a loss of primary containment and the discharge of approximately 200 lbs. of 400 °F MDI. Both persons were admitted to the hospital.

Rubicon failed to submit the data required under 40 C.F.R. § 68.168, 68.170(j), and 68.175(l) with respect to an accidental release of approximately 200 lbs. of 400 °F MDI, which resulted in the hospitalization of 2 contractor employees. A data submission was not made within 6 months of the January 15, 2022 release or by the time the RMP was to be updated (March 23, 2023) under 40 C.F.R. § 68.190, whichever was earlier. **AOC 1 - 40 C.F.R. § 68.42(a), 68.168, and 68.195**

Subpart D - Program 3 Prevention Program

40 C.F.R. § 68.65 Process Safety Information – I reviewed written process safety information, which includes information pertaining to the hazards of the regulated substances used or produced by the process, information pertaining to the technology of the process, and information pertaining to the equipment in the process.

I reviewed the Safety Data Sheets for the 6 RMP regulated chemicals: phosgene, chlorine, ammonia, formaldehyde, ethylene oxide, and propylene oxide to confirm toxicity information, permissible exposure limits, physical data, reactivity data, corrosivity data, thermal and chemical stability data, and the hazardous effects of inadvertent mixing of materials that could foreseeably occur. Rubicon documented information pertaining to the technology of the process, including block flow diagrams, process chemistry, maximum intended inventory inside the process, safety information procedures, safe upper and lower limits, and an evaluation of consequences of deviation from operating parameter limits.

I reviewed information that contained materials of construction, piping and instrumentation diagrams (P&IDs), electrical classification, relief system design and design basis, ventilation system design, design codes and standards employed, and safety systems.

-Rubicon failed to document between 2019-2023 the electrical classification category for all areas of the plant as identified in the March 2022 compliance audit (item #14). **AOC 2 - 40 C.F.R. § 68.65(d)(1)(iii)**

In each case below, Rubicon has failed to document the original correct and appropriate relief system design and design basis between 2019-2021/2023.

-Rubicon has failed to document that the relief system and relief system design addresses gaps in the pressure relief system and relief system design.

-Rubicon failed to document and complete the design verification for PSV-94 and resolve multiple deficiencies.

-Rubicon failed to document that between 3/2019-3/2021 the MT-24, Pressure Safety Valve (PSV-80) was undersized.

-Rubicon failed to document that the ethylene oxide (EO) vent stack is reduced to below the relief device discharge size. **AOC 3 - 40 C.F.R. § 68.65(d)(1)(iv)**

-Rubicon failed to document that 250+ atmospheric pressure relief devices relieve to a safe location in accordance with recognized and generally accepted good engineering practices such as, but not limited to, API 521 Section 5.8 and the CCPS Guidelines for Pressure Relief and Effluent Handling Systems; as examples:

Process Safety Element (PSE)- Rupture Disk 9246MS and Pressure Safety Valve (PSV-9233TP) and (PSE)-207 – a rupture disk,

Pressure Safety Valve (PSV-62) vents 300 psig steam towards handrail on 3rd deck, and (PSV-21) current discharge location releases.

Rubicon failed to document that atmospheric Process Safety Element (PSE) - Rupture Disk 92, Pressure Relief Valve (PSV-923), and PSE-2 Rupture Disk relieve to a safe location in accordance with recognized and generally accepted good engineering practices such as, but not limited to, API 521 Section 5.8 and the CCPS Guidelines for Pressure Relief and Effluent Handling Systems.

Rubicon failed to document that flammable and hazardous liquids being discharged beneath process equipment and to a grated trench at grade from pressure safety valves, relieve to a safe location in accordance with Recognized and Generally Accepted Good Engineering Practices (RAGAGEP) such as, but not limited to, API 521 Section 5.8 and the CCPS Guidelines for Pressure Relief and Effluent Handling Systems. **AOC 4 - 40 C.F.R. § 68.65(d)(2)**

40 C.F.R. § 68.67 Process hazard analysis (PHA) - Rubicon performed an initial process hazard analysis ("hazard evaluation") and then subsequent PHAs every 5 years on its covered processes. Rubicon conducts 6 separate PHAs for each covered process in the order originally set forth by an initial assessment. Rubicon currently uses the Hazard and Operability Study (HAZOP) technology to conduct process PHAs, sometimes in conjunction with a supplemental Layers of Protection Analysis (LOPA). PHAs are performed by a Rubicon staff team in a four-step process: (1) gather process safety information and evaluate management of change since the most recent previous PHA, (2) evaluate incident investigations during the contemporaneous period since the previous PHA, (3) evaluate recommendations from the previous PHA and, (4) evaluate P&IDs generated since the previous PHA to the current PHA. Rubicon uses "PHA Works" software to assist in promptly addressing the team's findings and recommendations. A separate PHA database is used to track the recommendations and actions. The facility holds

monthly "safety excellence" meetings to discuss overdue and coming due PHA action items.

During the March 2023 RMP inspection, 5 PHAs were reviewed (MDI-I, MDI-II, MDI-III, Polyols, and Chlorine Distribution System PHAs). The RMP standard requires the process hazard analysis to be appropriate to the complexity of the process and identify, evaluate, and control the hazards involved in the process. Rubicon had 7 instances in which the process hazard analysis has not been appropriate to the complexity of the process. **AOC 5 - 40 C.F.R. § 68.67(a)**

Since 2005, facility siting has been addressed by companies regulated by the OSHA PSM and the U.S. EPA RMP standards. The facility siting studies will typically include a blast study (explosion risk), toxic chemical release evaluations, and building location and occupancy rates as the core process safety information required to conduct the study. The American Petroleum Institute published the Recognized and Generally Accepted Good Engineering Practices (RAGAGEP) addressing consideration of hazards when locating buildings in API 752-1995, 752 2003 2nd edition, and 2009 3rd edition.

Rubicon conducted an explosion and toxic risk evaluation in 2006 and a facility siting analysis in 2016, which addressed only those buildings that were considered safe havens and shelter-in-place locations. The first full facility siting study was performed by Rubicon in November 2018 and included the following findings and recommendations, discussed in the study below.

Baker-Risk 2018 Facility Siting Study

"Rubicon/Huntsman contracted Baker-Risk to perform a Facility Siting Study (FSS) for its Geismar Facility in Geismar, Louisiana. Key elements of the study were to assess hazards to onsite personnel associated with operation of the plant and evaluate the resulting vulnerabilities for potential fire, toxic, and explosion hazards associated with the facility's operation.

Simple cost-effective risk reduction measures should be taken where available, but decisions regarding more costly upgrades should be based on results of a risk assessment. Baker-Risk is performing a Quantitative Risk Analysis (QRA) for the Geismar Facility to provide guidance for risk reduction measures."

Additional facility siting studies and Quantitative Risk Assessments were updated in November 2021, July 2022, and included the following conclusions:

Baker-Risk 2021 Facility Siting Study- Quantitative Risk Assessment Update 11/2021
Baker-Risk 2022 Facility Siting Study-PUR and Patriot Quantitative Risk Assessment Update 7/2022

The 2019 compliance audit (recommendation #4) identified that the facility siting checklists had not addressed the hazards of the process based on the findings and recommendations of the Baker Risk study conducted in 2018, 2021, and 2022. The facility siting checklists still do not compare existing building conditions against the Baker Risk study for occupied buildings subject to flammable, explosive, or toxic hazards between 2018 - 2023.

Rubicon has not implemented the mitigation recommendations in the 2018 Baker Risk facility siting study. Rubicon has not addressed the hazards of the process for stationary source siting. **AOC 6 - 40 C.F.R. § 68.67(c)(1) and (c)(5)**

Rubicon has not established a system to promptly address the team's findings and recommendations, completed actions as soon as possible, or assured that the recommendations are resolved in a timely manner.

During the 2023 RMP inspection I reviewed the findings and recommendations from the following PHAs: MDI-II 2020, MDI-III, and Polyols 2021. At the time of the September 2023 inspection, Polyols had 156 recommendations, 37 of which were closed, 10 were repeat findings, 119 open recommendations with a CAPEX note, 16 recommendations addressed relief devices (6 were open and 10 were closed). MDI-II had 46 recommendations, 6 of which were closed, and 40 were still open. All are due for completion by October 19, 2023. MDI-III had 79 recommendations, 74 of which were closed, 5 open recommendations related to process safety valves, which had completion delay approval. Rubicon did not resolve recommendations related to the scenario in the 2016 PHA and the 2019 compliance audits.

Recommendations in the Rubicon PHAs and compliance audits are being closed based on an action of further study. Further study should not closeout a PHA recommendation. Documentation of the resolution or mitigation of a hazard must be the final action.

The 2019 Action Plan details the following (049PSM0319-010) – All Corporate Items include the following statement: *“When PHA recommendations call for further studies to properly identify a scenario hazard and risk, the recommendations of the further studies are required to be reviewed by the management team and identify responsible persons and target completion dates in-line with the site risk matrix per EHS-107 Management of Actions. The additional actions accepted per the further studies are required to be tracked to closure. Rubicon Issue: Recommendations have not been reviewed actioned to closure for further studies that were a result of a PHA recommendation for further assessment.”*

The RMP standard requires Rubicon to promptly assure that recommendations addressing the hazards are resolved in a timely manner and actions abating these hazards be completed as soon as possible. While additional studies are often necessary to determine the best way to resolve a hazard, a study does not represent closure of a PHA recommendation, and the recommendation must continue in subsequent PHAs until there is mitigation of the hazard. The PHA must document what actions are to be taken and develop a written schedule of when these actions are to be completed. Rubicon has 10 instances in which the company has not promptly assured that PHA recommendations addressing the hazards are resolved in a timely manner and that actions abating these hazards are completed as soon as possible. **AOC 7 - 40 C.F.R. § 68.67(e)**

40 C.F.R. § 68.69 Operating Procedures – Rubicon has developed and implemented written operating procedures that provide instructions or steps for conducting activities associated with each covered process, consistent with the process safety information. Operating procedures are kept inside each unit's control room, with hard copies inside a binder as well as electronic versions housed within the facility's Lotus Notes system.

During the August 2019 U.S. EPA RMP Inspection of Rubicon, the EPA Inspector determined that the operating procedures addressed steps for each operating phase but did not fully address emergency shutdown, including the conditions under which emergency shutdown can be executed in a safe and timely manner. **AOC 8 - 40 C.F.R. § 68.69(a)(1)(iv)**

The procedures reviewed did not include safety and health considerations. **AOC 9 - 40 C.F.R. § 68.69(a)(3)**

Rubicon did not develop or implement safe work practices for employees and contractors to provide for the control of hazards such as, but not limited to, atmospheric relief valves that do not discharge to a safe location. **AOC 10 - 40 C.F.R. § 68.69(d)**

40 C.F.R. § 68.71 Training – Rubicon starts each new employee with an entrance exam to determine experience level and the training program needed. The first week consists of general training sessions, followed by 1-2 years of on-the-job training. Rubicon also provides employees with classroom training that occurs during the on-the-job

training period. Competency assurance evaluation and testing includes an assessment walkthrough of the process area as supervisors verify tasks performed, review unit drawings, and completion of offsite training and exams. Exams require an 80 percent pass rate. The facility documents that each employee involved in operating a process has received and understood the training by using both exams and on-the-job training. Each training record reviewed contained the required elements.

40 C.F.R. § 68.73 Mechanical Integrity - I conducted interviews with employees who manage Rubicon's mechanical integrity program for fixed equipment and pressure relief systems. Rubicon's fixed equipment department supports inspections and preventative maintenance on tanks, pressure relief devices, and piping. Rubicon manages its inspection and testing program using time-based and risk-based inspections (RBI). Mechanical integrity inspectors in the fixed equipment department are certified in American Petroleum Industry (API) standards 510, 570, and 653. The 2022 compliance audit states that *"clear and precise program elements are still in the baseline development for an RBMI and risk-based approach to elemental mechanical integrity (MI) management specifically for fixed and rotational equipment, I&E, Safety Instrumented Systems, and other components but overall programs were established inspection (WSE & Inspection and Testing Plan Management)."*

Rubicon failed to implement its mechanical integrity program when it neglected to perform and document an incident investigation was conducted or recorded in the Lotus Notes database for each pressure relief device identified, which failed to pop or when the valve failed to lift below 110% of its set pressure. The program requires that, "... all such failures will result in an adjustment in the relief device inspection frequency accordingly and review test and recertification records for all critical pressure relief devices (PRDs) for failure to lift below 110% of set pressure during the post service pre-disassembly set pressure/operability test."

Rubicon failed to establish short- or long-term corrosion rates for 3 pressure vessels. There is also a finding in the 2019 Compliance audit regarding the failure to calculate the remaining life for pressure vessel MR-4105A/B.

Rubicon failed to establish short term and long-term corrosion rates for 3 piping circuits and failed to develop isometric drawings, which identify the ultrasonic test condition monitoring locations for 1 piping circuit.

API 570 5.6.2 Corrosion rates, the remaining life and next inspection intervals should be calculated to determine the limiting component of each piping circuit.

API 570 7.9.6 Inspection Isometric Drawings (ISOs)

The primary purpose of inspection ISOs is to identify the location of CMLs and to identify the location of any recommended maintenance. Inspection ISOs are recommended and should contain the following:

Inspection ISOs are recommended for all unit piping and all Class 1 (or high consequence RBI) pipe rack piping on which CMLs have been identified for thickness measurement. AOC 11 - 40 C.F.R. § 68.73(b)

Upon review of the inspection and testing documents for 18 pressure vessels, 18 relief valves, and 18 piping circuits, it was determined that the inspection and testing intervals were not in accordance with API 510, 570, and 521. Rubicon failed to perform external inspections every 5 years or internal inspections every 10 years on pressure vessels as required by API 510. EPA identified 12 piping circuits, 11 pressure vessels, and 3 relief valves that were not being inspected at intervals as defined by the API code.

Rubicon failed to perform external inspections and NDE/UT inspections every 5 years for Class 1 piping or external inspections every 5 years and NDE/UT inspections every 10 years for Class 2 piping in accordance with API 570 Section 6.3.3, Table 1. **AOC 12 - 40 C.F.R. § 68.73(d)(2)**

API 570

Table 1—Recommended Maximum Inspection Intervals

Type of Circuit	Thickness Measurements	Visual External
Class 1	5 years	5 years
Class 2	10 years	5 years
Class 3	10 years	10 years

For Class 1, 2, and 3 piping, the period between thickness measurements for CMLs or circuits should not exceed one-half the remaining-life, or the maximum intervals recommended in Table 1, whichever is less. Whenever the remaining life is less than four years, the inspection interval may be the full remaining life up to a maximum of two years. The interval is established by the inspector or piping engineer in accordance with the owner/user's QA system.

API 570 Section 6.4 Extent of Visual External and CUI Inspections

External visual inspections, including inspections for CUI, should be conducted at intervals no greater than those listed in Table 1.

API 510

6.4 External Inspection

6.4.1 Unless justified by an RBI assessment, each aboveground vessel shall be given a visual external inspection at an interval that does not exceed the lesser of five years or the required internal/on-stream inspection. It is preferred to perform this inspection while the vessel is in operation.

6.5 Internal, On-stream, and Thickness Measurement Inspections

6.5.1 Inspection Interval

6.5.1.1 Unless justified by a RBI assessment, the period between internal or on-stream inspections and thickness measurement inspections shall not exceed one-half the remaining life of the vessel or 10 years, whichever is less. Whenever the remaining life is less than four years, the inspection interval may be the full remaining life up to a maximum of two years.

Rubicon extends the due date for process equipment using the management of change process. However, the justification for an extension of the due date must be done before the due date. Pressure vessels or pressure relieving devices that are operated beyond the due date without a valid deferral in accordance with these requirements are not permitted by this code. Rubicon failed to test 9 pressure relief valves every 5 years as required by API 510 Section 6.6.3.2. At the time of the August 2019 RMP inspection, Rubicon had 158 inspections that were past due for pressure vessels and piping circuits, an additional 27 overdue inspections were currently "on daily sheets" for inspection soon, and 3 pressure relief valves (PSV-4074, PSV-4074A, and PSV-053A) that were past due. There were also 3 rotational equipment inspections past due and 4 instrumentation inspections past due, 3 of which were denoted as "Critical". Many of these inspections were not completed until 2020 and 2021.

AOC 13 - 40 C.F.R. § 68.73(d)(3)

API 510 Section 6.6.3.2 Testing and Inspection Intervals

Unless documented experience and/or an RBI assessment indicates that a longer interval is acceptable, test and inspection intervals for pressure-relieving devices in typical process services should not exceed: a) 5 years for typical process services.

API 510 Section 6.7 Deferral of Inspections, Tests, and Examinations

Inspections, tests, or examinations for pressure vessels and associated pressure-relieving devices that cannot be completed by their due date may be deferred for a specified period, subject to the requirements in the following subsections. Pressure vessels or pressure-relieving devices that are operated beyond the due date without a valid

deferral in accordance with these requirements are not permitted by this code. Deferrals should be the occasional exception, not a frequent occurrence. All deferrals shall be documented. Pressure vessels or pressure-relieving devices that were granted a deferral can be operated to the new due date without being considered overdue for the deferred inspections, tests, or examinations.

EPA reviewed Rubicon's hydrant and monitor quarterly inspection reports from Q1-2021 to Q3-2023. Rubicon has conducted inspection and tests of 85 hydrants/monitors between the period of Q1-2021-Q3-2023. Of those, 37 hydrant/monitors were found to be in good conditions and not requiring maintenance. Also, 48 hydrant/monitors did require maintenance and 16 of the 48 had a work order attached. The necessary repairs included monitor swivel leaks, valves that would not operate, plugged drain valves, monitors that were hard to operate, broken valves, wet barrels that were badly corroded, a lock knob was broken, there was a cracked foam hose, and corroded studs on a monitor flange. However, only a few of the repairs required by the work orders have been completed.

In March of 2019, it was determined that the ethylene oxide (EO) vent stack was reduced to below the relief device discharge size. Rubicon has failed to install modifications to the relief devices or the vent stack between March 2019 and September 2023.

In January of 2020, it was determined that the relief device was calculated to be undersized. Rubicon has not installed a relief hatch system between January 2020 and September 2023.

During Rubicon's May 31, 2022 API 570 external inspection of unit MDI 1 piping circuit (PIP4210005-from PP-41), photographs were taken identifying equipment deficiencies. **AOC 14 - 40 C.F.R. § 68.73(e)**

40 C.F.R. § 68.75 Management of Change (MOC) - Rubicon has established written procedures to manage changes to process chemicals, technology, equipment, personnel, and changes that affect a covered process. A management of change group at Rubicon consists of at least 3 employee team members, of which 2 must be knowledgeable in the process and 1 must be knowledgeable in the equipment, technology, or chemicals. Also, 1 team member can be a unit superintendent.

Rubicon failed to implement written procedures to manage changes to process technology and equipment for: MOC # 049/19/MC0033, MOC # 049/20/MC-0216, and MOC # 20210927. **AOC 15 - 40 C.F.R. § 68.75(a)**

During the August 2019 RMP Inspection of Rubicon, the EPA Inspector determined that the operating procedures were not updated in a timely manner after an MOC was completed. There were 3 MOCs evaluated that resulted in changes to operating procedures or practices and those procedures had not been updated. This was also a finding in 2 of the compliance audits.

40 C.F.R. § 68.75(e) requires that changes in operating procedures be managed in accordance with the management of change policy. At the time of this inspection, Rubicon failed to apply their management of change process when changes or updates were made to their operating procedures. **AOC 16 - 40 C.F.R. § 68.75(e)**

40 C.F.R. § 68.77 Pre-startup Safety Review - I reviewed selected pre-startup safety reviews (PSSR) for the associated MOCs reviewed. The PSSRs documented that, when the facility installed a new stationary source or significantly modified an existing source, a review was conducted prior to the introduction of the newly regulated substance, including the appropriate communication elements and training.

40 C.F.R. § 68.79 Compliance Audits - Rubicon provided the two most recent Risk Management Plan Compliance Audits completed March 22, 2019 and March 22, 2022. I reviewed the audit findings outlined in the reports for

each audit. Rubicon had not promptly determined and documented an appropriate response to 3 of the findings in the 2019 and 2022 compliance audits. Also, recommendations and proposed actions for other findings from the 2019 audit had still not been completed or were completed after the proposed due dates. **AOC 17 - 40 C.F.R. § 68.69(d)**

40 C.F.R. § 68.81 Incident Investigation - I reviewed 18 selected incident investigations to ensure that: investigations were initiated no later than 48 hours following the incident, there was a description of the incident, the factors that contributed to the incident; any recommendations resulting from the investigation and the findings and recommendations were addressed and resolved promptly. Rubicon assembles an investigation team depending on the initial assessment of the event. A risk ranking matrix is used to determine the level of investigation. Rubicon has "Operational Excellence" meetings periodically to discuss past due action items.

During the August 2019 EPA RMP Inspection, Rubicon had not established an effective system to address and resolve incident report findings and recommendations and document resolutions and corrective actions. Rubicon had 24 action items that were past due.

For this EPA RMP inspection, Rubicon failed to establish a system to promptly address and resolve the incident report findings and recommendations resulting from the January 15, 2022 incident in which 2 contractor employees were injured during an upset event in the MDI-1 Dechlorination Column system, when the column's rupture disk activated exposing the 2 employees to the discharge of approximately 200 lbs. of 400 °F MDI. As of March 27, 2023, Rubicon failed to establish a system to promptly address and resolve the January 15, 2022 incident report's findings and recommendations (Action ID 17); instead adopting a (*long term*) plan to address the location and design of relief devices and the associated discharges identified as hazardous. **AOC 18 - 40 C.F.R. § 68.81(e)**

40 C.F.R. § 68.83 Employee Participation - I reviewed Rubicon's "Process Safety Management Employee Participation" procedure regarding the implementation of the employee participation required by this subpart. All the provided documentation met the requirements.

40 C.F.R. § 68.85 Hot Work Permit - I reviewed Rubicon's hot work procedure. Before hot work begins, an operation's representative inspects the equipment that will be used prior to sign off. The facility issues hot work permits for hot work operations conducted on or near a covered process for the duration of the current shift. The following shift can revalidate a hot work permit if the work must continue, and the scope of work has not changed. Permits are issued through the Risk Assessed Permitting (RAP) electronic system. The permits reviewed indicated the dates authorized for the hot work and the permits documented that the fire prevention and protection requirements of 29 C.F.R. 1910.252(a) were implemented. Rubicon periodically audits its hot work program to ensure employee knowledge and compliance. Hot work permits are kept on site for 6 months and in company archives for 2 years.

40 C.F.R. § 68.87 Contractors - Rubicon initially evaluates information regarding a contractor's safety performance record and programs when selecting a contractor through Avetta. Avetta will vet the contractor's security, recordable incidents, safety, and insurance information. Rubicon flags contractors as site-specific to track their work on any corporate site on a case-by-case basis. Prior to arriving at Rubicon, contractors receive a safety orientation training provided by the safety council, as well as Rubicon site-specific training, to educate potential contractors of the known fire, explosion, or toxic release hazards related to the contractor's work. They also receive guidance of the applicable provisions of the emergency response action plan.

Subpart E - Emergency Response

40 C.F.R. § 68.90 Applicability - Rubicon is designated as the "first responder" in case of an accidental release of regulated substances.

40 C.F.R. § 68.95 Emergency Response Program - Stationary sources with any regulated toxic substances stored in a process above threshold quantity are included in the community emergency response plan developed under 42 U.S.C. 11003.

The emergency response brigade consists of all operations personnel. Brigade members receive a variety of preparedness trainings, which may include courses on rope rescue, fire, hazardous materials ("HAZMAT"), emergency medical technician, and incident command system structure. The site holds drills periodically that include the local Geismar fire department and HAZMAT personnel. Rubicon is a member of the Ascension Parish Industrial Mutual Aid Group (IMAG), which uses the Community Awareness Emergency Response (CAER) system to disseminate emergency information. CAER Radio is used to contact the local sheriff and members of IMAG in the event a release could potentially affect neighboring plants and public receptors.

The Rubicon emergency response plan requires the facility to conduct an emergency drill annually. The November 2022 emergency drill was cancelled and at the time of the inspection and the 2023 emergency drill had not yet been performed. In place of the 2022 emergency drill the facility required the employees review an online PowerPoint intended to simulate a drill. EPA does not believe that a computer-based emergency scenario is an appropriate substitute for an actual emergency drill and does not meet the intent of the standard. **AOC 19 - 40 C.F.R. § 68.95(a)**

The Rubicon emergency response plan requires that an Administration Building Personnel Evacuation Checklist be maintained so, that in the event of an accidental release all employees who work in the building can be accounted for. The checklist was not being updated monthly and the September 2023 checklist included employees who had retired and others that were no longer employed by Rubicon. **AOC 20 - 40 C.F.R. § 68.95(a)(4)**

Subpart G - Risk Management Plan (RMP)

40 C.F.R. § 68.190 Updates - Rubicon's RMP was resubmitted as a 5-year update on March 23, 2023.

40 C.F.R. § 68.195 Required corrections - Rubicon's next RMP resubmission is due by March 23, 2028, unless an update or correction is required by 40 C.F.R. §§ 68.190 and 68.195.

SECTION III - AREAS OF CONCERN

AOC 1 - 40 C.F.R. §§ 68.42(a) & 68.168 Five-year accident history

40 C.F.R. § 68.42(a) Five-year accident history: *The owner or operator shall include in the five-year accident history all accidental releases from covered processes that resulted in deaths, injuries, or significant property damage on site, or known offsite deaths, injuries, evacuations, sheltering in place, property damage, or environmental damage.*

40 C.F.R. § 68.168 Five-year accident history: *The owner or operator shall submit in the RMP the information provided in § 68.42(b) on each accident covered by § 68.42(a).*

Rubicon failed to include in their March 23, 2023 Risk Management Plan submittal's 5-year Accident History a

chemical release from a covered process, which occurred on January 15, 2022. There were 2 contractor employees injured during an upset event on the MDI-1 Dechlorination Column system, when the column's rupture disk activated, resulting in a loss of primary containment and discharge of approximately 200 lbs. of 400 °F methylene diphenyl diisocyanate (MDI), (CAS Number 101-68-8). Both persons were admitted to the hospital.

40 C.F.R. § 68.195(a) For any accidental release meeting the five-year accident history reporting criteria of § 68.42 and occurring after April 9, 2004, the owner or operator shall submit the data required under §§ 68.168, 68.170(j), and 68.175(l) with respect to that accident within six months of the release or by the time the RMP is updated under § 68.190, whichever is earlier.

Rubicon failed to submit the data required under §§ 68.168, 68.170(j), and 68.175(l) with respect to an accidental release of approximately 200 lbs. of 400 °F MDI, which resulted in the hospitalization of 2 contractor employees. A data submission was not made within six months of the January 15, 2022, release or by the time the RMP is updated (March 23, 2023) under § 68.190, whichever is earlier.

AOC 2 – 40 C.F.R. § 68.65(d)(1)(iii) Process safety information

Information pertaining to the equipment in the process shall include electrical classification.

- i. Rubicon failed to document the electrical classification revalidation for all areas of the plant as identified in the March 2022 compliance audit (recommendations #5-10) between 2019-2023.
- ii. Rubicon failed to completely document electrically classified areas in the facility, which included an assessment of process and material usage data, methods to address hazards, modifications to eliminate hazards to meet area requirements, identifying ignition sources, developing, and implementing action plans, and assuring that all such assessments are documented as identified in the March 2022 compliance audit (recommendations #5-10) between 2019-2023.

Rubicon has failed to document that all equipment in hazardous locations identified as an ignition source were corrected, repaired, or removed, in accordance with the correct electrical classification category for all areas of the plant as identified in the 2022 compliance audit between 2019-2023 (recommendations #5-10).

AOC 3 – 40 C.F.R. § 68.65(d)(1)(iv) Process safety information

Information pertaining to the equipment in the process shall include relief system design and design basis;

- i. Rubicon has failed to document that the relief system and relief system design addresses gaps in the pressure relief system and relief system design such as, but not limited to, reaction force or system integrity calculation methodology, liquid overfill scenarios in atmospheric tanks, liquid discharge to an open trench, atmospheric relief of hazardous chemicals, a systematic process for updating relief documentation. This was identified in the March 2022 compliance audit recommendations (recommendations #11-15,17,18).
- ii. Rubicon failed to correctly document the appropriate process safety information. This finding and a subsequent recommendation were identified in the March 2019 compliance audit (#049DDR0319-015).
- iii. The March 2019 compliance audit included a finding and recommendation that the discharge of the ethylene oxide (EO) vent stack is reduced to below the relief device discharge size.

AOC 4 – 40 C.F.R. § 68.65(d)(2) Process Safety Information

The owner or operator shall document that equipment complies with recognized and generally accepted good engineering practices.

- i. Rubicon failed to correctly document that some atmospheric pressure relief devices relieve to a safe location in accordance with recognized and generally accepted good engineering practices such as, but not limited to, API 521 Section 5.8 and the CCPS Guidelines for Pressure Relief and Effluent Handling Systems.
- ii. Rubicon failed to document that atmospheric process safety element (PSE) rupture disk (9246MS) and pressure relief valve (PSV-92) relieve to a safe location in accordance with recognized and generally accepted good engineering practices such as, but not limited to, API 521 Section 5.8 and the CCPS Guidelines for Pressure Relief and Effluent Handling Systems.
- iii. Rubicon failed to document that atmospheric process safety element (PSE-207), a rupture disk, discharged to a safe location in accordance with recognized and generally accepted good engineering practices such as, but not limited to, API 521 Section 5.8 and the CCPS Guidelines for Pressure Relief and Effluent Handling Systems.
- iv. Rubicon failed to document that flammable and/or hazardous liquids being discharged from pressure safety valves to unsafe locations; beneath process equipment and/or to a grated trench at grade.

AOC 5 - 40 C.F.R. § 68.67(a) Process Hazard Analysis

The process hazard analysis shall be appropriate to the complexity of the process and shall identify, evaluate, and control the hazards involved in the process.

- i. The Rubicon MDI-II process hazard analysis was not appropriate to the complexity of the process in that it did not correctly evaluate and control the hazards of aniline present in a covered process. Rubicon addressed PHA recommendations (62-78), to evaluate the discharge of PSVs to a safe location, by dismissing that controls were necessary. This is not consistent with the OSHA, NIOSH, and New Jersey Department of Health assessment, which indicates that exposure to aniline could result in anemia, liver and nervous system damage, and exposure to very high levels of aniline can cause trouble breathing, collapse, and death.
- ii. The Rubicon MDI-II process hazard analysis recommendations (76-78) were not appropriate to the complexity of the process in that it did not correctly evaluate and control the hazards.
- iii. Rubicon addressed PHA recommendations (80, 82) related to the discharge of steam from a PSV to walking and working surfaces by asserting that no hazard existed as the area of discharge was to a low traffic area protected by a shroud. The current discharge location exposes employees and contractors to burns from steam resulting from a PSV discharge.
- iv. The Rubicon MDI-II process hazard analysis was not appropriate to the complexity of the process in that it did not correctly evaluate and control. Potential to exceed RQ (100 lbs.) for MCB. Rubicon addressed PHA recommendations (81) determining that the discharge was safe as the area of discharge was to a shroud on the deck.
- v. The Rubicon MDI-II process hazard analysis was not appropriate to the complexity of the process in that it did not correctly evaluate and control for MS-67. Rubicon addressed PHA recommendations (84) determining that the discharge of material in the vapor phase to atmosphere on the third deck was safe.

vi. Rubicon's process hazard analysis has not identified, evaluated, and controlled the hazards of flammable and toxic release scenarios. The facility siting PHAs does not consider or evaluate the impact from approximately 250+ atmospheric pressure safety relief valves, which if function as designed would release flammable and/or toxic materials into the process area and environment.

vii. Rubicon's process hazard analysis has not identified, evaluated, and controlled the hazards of flammable and toxic release scenarios. Rubicon has in place 16+ pressure safety valves and 16+ rupture disks at the facility that are atmospheric relief devices, which have the potential to release ethylene oxide into the environment. Since ethylene oxide is both flammable and highly reactive, acute exposures to ethylene oxide gas may result in respiratory irritation and lung injury, headache, nausea, vomiting, diarrhea, shortness of breath, and cyanosis. Chronic exposure also has been associated with the occurrence of neurotoxicity and sensitization. The OSHA standard for acute exposure to ethylene oxide is set at 5 ppm with a 15-minute excursion limit.

AOC 6 - 40 C.F.R. § 68.67(c)(1) and (c)(5) Process Hazard Analysis

The process hazard analysis shall address: (c)(1) The hazards of the process; including (c)(5) stationary source siting.

i. Rubicon has failed to address the hazards of the process involving the flammable, explosive, and toxic risks to occupied buildings, building occupants, and employees present outside of buildings, which were addressed in the Baker-Risk 2018, 2021, and 2022 facility siting studies.

Rubicon failed to implement engineering controls to mitigate exposure to building occupants, workers, and the public.

ii. The PHA facility siting checklists for MDI-2 and MDI-3 are not appropriate for the complexity of the process in that many of the responses are "defer" to the Baker Risk Facility Siting study, not applicable, or no and require a modification be implemented, or yes when the answer should be no.

AOC 7 - 40 C.F.R. § 68.67(e) Process Hazard Analysis

The owner or operator shall establish a system to promptly address the team's findings and recommendations; assure that the recommendations are resolved in a timely manner and that the resolution is documented; document what actions are to be taken; complete actions as soon as possible; develop a written schedule of when these actions are to be completed; communicate the actions to operating, maintenance and other employees whose work assignments are in the process and who may be affected by the recommendations or actions.

i. Rubicon has failed to assure that recommendations are resolved in a timely manner and actions are completed as soon as possible. The Rubicon MDI-II 2020 process hazard analysis recommendation (79) was accepted by the PHA Team. However, at the time of the March 2023 RMP inspection the scope of work to mitigate the hazard had not been completed nor had any field modification been completed. Rubicon has set a final implementation due date of October 19, 2025.

ii. Rubicon has failed to assure that recommendations are resolved in a timely manner and actions are completed as soon as possible. The Rubicon MDI-II 2020 process hazard analysis recommendation (83) The Rubicon PHA Team has accepted this recommendation and the mitigation. However, at the time of the March 2023 RMP inspection the scope of work to mitigate the hazard had not been completed nor had any field modification been

finalized. Rubicon has set a final implementation due date of October 19, 2025.

iii. Rubicon has failed to assure that recommendations are resolved in a timely manner and actions are completed as soon as possible. The Rubicon MDI-II 2020 process hazard analysis recommendation (50). However, at the time of the March RMP 2023 inspection, the scope of work to mitigate the hazard had not been completed nor had any field modification been finalized. Rubicon has set a final implementation due date of October 19, 2025.

iv. Rubicon has failed to assure that recommendations are resolved in a timely manner and actions are completed as soon as possible. The Rubicon MDI-II 2020 process hazard analysis recommendation (145) Rubicon set a final implementation due date of October 19, 2025.

v. Rubicon has failed to assure that recommendations are resolved in a timely manner and actions are completed as soon as possible. The Rubicon MDI-II 2020 process hazard analysis recommendation (167) Rubicon set a final implementation due date of October 19, 2025.

vi. Rubicon has failed to assure that recommendations are resolved in a timely manner and actions are completed as soon as possible. The Rubicon Chlorine Distribution System 2017 process hazard analysis contained the following recommendation:

The following recommendation contained in the 2017/2022 Chlorine Distribution PHA were still open with a target date of July 20, 2024:

1. Change Flow valve (FV-0057G) from fail closed to fail open.

The Rubicon MDI-2 2020 Chlorine Distribution process hazard analysis contained the following recommendation (4), which also is identified in the Chlorine Distribution System PHA (14):

Original due date was February 28, 2023 and the target date was changed to July 20, 2024.

vii. Rubicon has failed to assure that recommendations are resolved in a timely manner and actions are completed as soon as possible. The 2019 compliance audit (recommendation #4) identified that the facility siting checklists had not addressed the hazards of the process based on the findings and recommendations of the Baker Risk study conducted in 2018, 2021, and 2022. While the facility checklists have been completed, they still do not compare existing building conditions against the Baker Risk study for occupied buildings subject to flammable, explosive or toxic hazards between 2019-2023.

viii. Rubicon did not establish a system to promptly address the team's findings and recommendations, assure that the recommendations were resolved in a timely manner or that the actions were completed as soon as possible. The Rubicon MDI-III 2020 process hazard analysis identified the following recommendations, which required mitigation to prevent a catastrophic release impacting safety, health, or an environmental event: 1-8, 12-20, 22-31, 32-35, 38, 39, 41, 43, 44, 46, 47, 59, 50, 52, 54, 65, 68, 69-71, 73, 75, 79-88, 91-93, 95-98, 101, 103-106. The target date, March 27, 2023, represents the date for completion of the recommendations. All these recommendations were overdue as they were not completed until June-September of 2023. The completion date allows 3 years to complete the scope of work, which does not set a target date for any modifications to the process to be completed, to assure the process is safe.

ix. Rubicon did not establish a system to promptly address the team's findings and recommendations, assure that the recommendations are resolved in a timely manner, or that the actions were completed as soon as

possible. The Rubicon MDI-III 2020 process hazard analysis identified the following recommendations, which required mitigation to prevent a catastrophic release impacting safety, health, or an environmental event: 20, 23, 24, 25, and 29. The target date March 27, 2023 for preparation of the scope has passed and these recommendations are all still open. Hence, any modifications to the equipment or the process has not yet been determined or performed.

x. Rubicon did not establish a system to promptly address the team's findings and recommendations, assure that the recommendations are resolved in a timely manner, or complete actions as soon as possible. The Rubicon MDI-II 2020 process hazard analysis identified the following recommendations, which required mitigation to prevent a catastrophic release impacting safety, health, or an environmental event: 50, 54, 79, 83, 85-89, 91, 97, 136, 138, 139, 143, 145, 147, 151, 166-168, 171-173, 178, 184-189, 191, 194-197. All these recommendations were overdue as they were not completed by the target date of October 19, 2023. The completion date allows 3 years for completion of each scope work, which does not set a target for any modifications to the process to be completed, to assure the process is safe.

AOC 8 - 40 C.F.R. § 68.69(a)(1)(iv) Operating Procedures

The owner or operator shall develop and implement written operating procedures that provide clear instructions for safely conducting activities involved in each covered process consistent with the process safety information and shall address at least the following elements. (1) Steps for each operating phase: (iv) Emergency shutdown including the conditions under which emergency shutdown is required, and the assignment of shutdown responsibility to qualified operators to ensure that emergency shutdown is executed in a safe and timely manner.

During the August 2019 RMP inspection, EPA determined as an Area of Concern that the procedures addressed steps for each operating phase; however, did not fully address emergency shutdown, including the conditions under which emergency shutdown is required and executed in a safe and timely manner.

Rubicon has not ensured that all operating procedures address the conditions for emergency shutdown between 2019-2021.

AOC 9 - 40 C.F.R. § 68.69(a)(3) Operating Procedures

The owner or operator shall develop and implement written operating procedures that provide clear instructions for safely conducting activities involved in each covered process consistent with the process safety information and shall address at least the following element - Safety and health considerations.

During the August 2019 RMP inspection, EPA determined as an Area of Concern that the operating procedures did not address safety and health considerations regarding hazards. This was also a finding during the March 2019 compliance audit.

Rubicon has not ensured that all operating procedures consider safety and health hazards between 2019-April 2020.

AOC 10 - 40 C.F.R. § 68.69(d) Operating Procedures

The owner or operator shall develop and implement safe work practices to provide for the control of hazards during operations such as lockout/tagout; confined space entry; opening process equipment or piping; and control over entrance into a stationary source by maintenance, contractor, laboratory, or other support

personnel. These safe work practices shall apply to employees and contractor employees.

Rubicon failed to develop and implement safe work practices to provide for the protection of employees and contractors performing work adjacent to the Dechlorination Column (AS-4202) and pressure rupture disk (PSE-207). There were 2 contractor employees, while working on the LUWA Feed Pump (PP-4800A), that were seriously burned due to the activation of PSE-207 and a discharge of approximately 200 lbs. of hot 400 °F methylene diphenyl diisocyanate (MDI) (CAS No. 101-68-8).

AOC 11 - 40 C.F.R. § 68.73(b) Mechanical Integrity

Written procedures. The owner or operator shall establish and implement written procedures to maintain the on-going integrity of process equipment.

i. Rubicon failed to implement its mechanical integrity program when it neglected to promptly complete a recommendation identified in the 2019 compliance (finding 049PSM0319) advising the addition of rupture discs to address plugging issues on the PSV outlets. The program also requires that testing failures will result in an adjustment in the relief device inspection frequency accordingly; and to review, test, and recertify records for all critical pressure relief devices (PRDs) which fail to lift below 110% of set pressure, during the post-service pre-disassembly set pressure/operability test.

ii. Rubicon failed to establish short or long-term corrosion rates in accordance with API 510 for the following pressure vessels in accordance with API 510:

MS-6212 - No short or long-term corrosion rate established for the head knuckle, manway, and shell;
AS-6202 – Ultrasonic Testing (UT) initiated 2/25/2021; no UT performed before 2021; No short- or long-term corrosion rate established;
MS-7019 - No short or long-term corrosion rate established for the head and shell.

iii. Rubicon failed to establish short-term and long-term corrosion rates in accordance with API 570 Section 5.6.2 and 7.1.1 for the following piping circuits: PIP6250002, CKT6220011, and PIP6210028DL.

API 570 5.6.2 Corrosion rates, the remaining life and next inspection intervals should be calculated to determine the limiting component of each piping circuit.

AOC 12 - 40 C.F.R. § 68.73(d)(2) Mechanical Integrity

Inspection and testing. Inspection and testing procedures shall follow recognized and generally accepted good engineering practices.

i. Rubicon failed to perform external and NDE/UT inspections every 5 years for Class 1 piping in accordance with API 570 Section 6.3.3 for the following piping circuits:

Piping Circuit

a. PIP4230058 external inspection was due January 13, 2021 (previously performed January 13, 2016). External Inspection was not performed until September 20, 2022.

b. PIP4210100DL external inspection had not been performed between April 2019 to March 2023. An external inspection was performed April 11, 2023, after the U.S. EPA RMP Inspection was initiated, and a UT/NDE has never been performed.

- c. PIP4210059 external inspection had not been performed between April 2019-March 2023. External inspection was performed April 11, 2023, after the U.S. EPA RMP Inspection was initiated, and a UT/NDE has never been performed.
- d. PIP4210042 external inspection had not been performed between April 2019-March 2023. External Inspection was performed April 11, 2023, after the U.S. EPA RMP Inspection was initiated, and a UT/NDE has never been performed.
- e. CKT6220011 external inspection was due July 22, 2020 and previously performed on July 22, 2015. External Inspection was not performed until September 20, 2022.
- f. PIP6210042 external inspection was due March 25, 2020 and was previously performed March 25, 2015. External Inspection was not performed until July 5, 2022.
- g. CKT6210001 no external inspection or a UT/NDE has ever been performed.
- h. PIP4210005 external inspection was due September 15, 2019 and previously was performed September 15, 2014. External Inspection was not performed until May 31, 2022. A UT was due on September 21, 2023 at CML 016TE180 tee south but was not performed.
- i. PIP6210028DL No external inspection was performed prior to August 17, 2020 (previous external inspections unknown).
- j. PIP4240002 An external inspection was due October 20, 2019 and was last performed October 20, 2014. External Inspection was not performed until October 11, 2022.

Failure to conduct ultrasonic testing every five years, which was due August 20, 2019, on Class 1 piping containing 45% chlorine. The previous UT was performed August 20, 2014.

- k. PIP4240002 UT inspection was due August 20, 2019 and was previously performed August 20, 2014.

ii. Rubicon failed to perform external inspections every 5 years or internal inspection every 10 years on pressure vessels in accordance with API 510 Section 6.4 and Section 6.5 for the following pressure vessels:

- a. TT-4303B An external inspection had not been performed between May 2013 to March 2023. External Inspection was not performed until April 9, 2023.
- b. MS-6212 An external inspection was not performed between March 16, 2012 - July 12, 2021. The last external inspection was conducted March 16, 2012.
- c. AS-6303 An external inspection was not performed between March 16, 2019 - March 16, 2023. The last external inspection was performed on March 16, 2013.
- d. AS-4210 An external inspection was not performed between January 28, 2021 - December 25, 2022. The last external inspection was conducted January 28, 2016. An external Inspection was not performed until December 25, 2022.
- e. MR-4015A An external inspection was not performed between March 1, 2018 - March 1, 2022. The last external inspection was November 22, 2013. An external Inspection was not performed until May 25, 2022.

f. MR-7019 No internal inspection has ever been performed.

g. AS-4101 No internal inspection has ever been performed.

h. AS-4104 An external inspection has not been performed between March 4, 2018 to March 14, 2023. An external Inspection was last performed October 8, 2008. An external Inspection was not performed until April 3, 2023, after the initiation of the U.S. EPA RMP Inspection. No internal inspection of pressure vessel AS-4104 has ever been performed.

i. AS-6117A An external inspection was due September 2021 and was previously performed September 2016. An external Inspection was not performed until June 13, 2022.

j. Failure to conduct external, internal, or UT/NDE inspections on MS-41).

iii. Rubicon failed to perform ultrasonic testing every 10 years on pressure vessels in accordance with API 510 Section 6.4 and Section 6.5 for the following pressure vessels:

a. AS-4203 Failure to perform a UT on CML 004SH (ring), which was due for testing May 27, 2021.

b. AS-4104 Ultrasonic testing has not been performed between 3/4/2018 to 3/14/2023. Ultrasonic testing was last performed 10/8/2008 but no data has been provided. Ultrasonic testing was not performed until 4/3/2023, after the initiation of the U.S. EPA RMP inspection.

iv. Rubicon failed to initiate a management of change by extending the due date for process equipment prior to the due date of the inspection and test. The following pressure vessels were operated beyond their due date without a valid deferral, which is not permitted by the code; in accordance with API 510 Section 6.6.7.

Process Equipment	Inspection due date	Initiation date of MOC	Inspection date
PSV-9401CMR-1	June 27, 2022	August 3, 2022	January 23, 2023
PSV-9720MS	June 27, 2022	August 3, 2022	January 23, 2023
PSV-9720TT	May 20, 2022	August 3, 2022	February 7, 2023

AOC 13 - 40 C.F.R. § 68.73(d)(3) Mechanical Integrity

The frequency of inspections and tests of process equipment shall be consistent with applicable manufacturers' recommendations and good engineering practices, and more frequently if determined to be necessary by prior operating experience.

i. Rubicon failed to test process relief/safety valves every 5 years, as required by API 510 Section 6.6.3.2 for the following pressure relief valves:

PSV #	Inspection and Test Date	Inspection and Test Due Date	Latest Test Date
PSV 4197	February 12, 2015	February 12, 2020	January 2023 1/2023 PSV changed
PSV064X	April 27, 2016	April 27, 2021	
PSV6204CTS	February 22, 2018	February 22, 2023	
PSV-0101	November 5, 2018	November 5, 2023	
PSV-0304	December 21, 2014	December 21, 2019	March 24, 2022
PSV-059M	January 28, 2016	January 28, 2021	

PSV0186X	April 29, 2016	April 29, 2021	September 14, 2022
PSV2254M	March 16, 2015	November 30, 2018	
PSV-6111MR	Unknown	Unknown	November 30, 2021
unknown no indication of when a previous test was performed			

ii. At the time of the August 2019 EPA RMP inspection, Rubicon had 158 inspections that were past due for pressure vessels and piping circuits, an additional 27 overdue inspections were currently "on daily sheets" for inspection soon, and 3 pressure relief valves (PSV-4074, PSV-4074A, and PSV-053A) that were past due. There were also 3 rotational equipment inspections past due and 4 instrumentation inspections (3 critical) past due. Many of these inspections were not completed until 2020 and 2021.

AOC 14 - 40 C.F.R. § 68.73(e) Mechanical Integrity

Equipment deficiencies. The owner or operator shall correct deficiencies in equipment that are outside acceptable limits (defined by the process safety information in §68.65) before further use or in a safe and timely manner when necessary means are taken to assure safe operation.

Rubicon failed to correct deficiencies in following equipment that are outside acceptable limits before further use or in a safe and timely manner.

i. Hydrant and monitor Inspections: The following hydrant or monitor did not provide full-flow water:

M-12	February 1, 2021 - August 1, 2022 (no water)
HM-61	February 1, 2021 - February 6, 2023
HM-20	February 1, 2021 - May 11, 2022
H-13	February 1, 2021 - November 7, 2022
HM-3	February 1, 2021 - November 3, 2021
H-12	February 1, 2021 - February 8, 2023
H-121	August 3, 2021 - November 3, 2021 (no water)
H-1	August 1, 2022 - February 8, 2023

Other deficiencies noted during these inspections, which existed for more than two quarters, included wet barrel hydrant badly corroded, leaking outlets, missing valve handles, packing gland broken, and bad drain levers.

ii. Some damaged hydrants and monitors had maintenance work orders prepared (2925510 and 2999704) but did not get repaired by February 26, 2023, if at all.

The following maintenance work orders were initiated January 31, 2022 and the repairs had not been completed by February 6, 2023: 3014245, 3006814, 3015687, 3015688, 3015537, and 3015611.

iii. In January 2020, it was determined that the relief device for the MT-24) was calculated to be undersized. The mitigation was to install a relief hatch system to provide additional capacity. Rubicon failed to correct deficiencies in the relief device for the (MT-24) by not installing a relief hatch system in a safe and timely manner between January 2020 - September 2023.

iv. In March 2019, it was determined that the ethylene oxide (EO) vent stack was reduced to below the relief device discharge size. For Rubicon has not corrected deficiencies in the vent stack or relief devices or relief discharge system in a safe and timely manner between March 2019 and September 2023.

v. During the May 31, 2022 , a review of API 570 external inspections for the MDI-1 unit piping circuit identified

the following equipment deficiencies:

- Photograph-4 missing valve handle
- Photograph-5 Flange/bolt corrosion
- Photograph-7 Pitting .100"-.120" (3"/Nominal .216")
- Photograph-9 Flange/bolt corrosion
- Photograph-17 Flange/bolt corrosion
- Photograph-23 Flange to pipe contact
- Photograph-34 HV-42367B with flange corrosion & HV-42366B
- Photograph-40 Flange/bolt corrosion
- Photograph-51 3" SOF & missing handle
- Photograph-56 Leak on FV-102/2 at MR-4105B
- Photograph-77 Pitting .030" and missing valve handle at PP-4150 (monitor area)

AOC 15 - 40 C.F.R. § 68.75(a) Management of Change

The owner or operator shall establish and implement written procedures to manage changes (except for "replacements in kind") to process chemicals, technology, equipment, and procedures; and, changes to stationary sources that affect a covered process.

i. Rubicon failed to implement written procedures to manage changes to process technology and equipment for (MOC#20210927) Polyol Area Clamp a Redi-Clamp with Buna N material installed in service possibly containing ethylene oxide/propylene oxide (incompatible material selection), in conflict with procedure 0690-RPPM and EHS-415 (Attachment D).

AOC 16 - 40 C.F.R. § 68.75(e) Management of Change

If a change covered by this paragraph results in a change in the operating procedures or practices required by § 68.69, such procedures or practices shall be updated accordingly.

Rubicon failed to ensure that changes in operating procedures are administered through the management of change process.

AOC 17 - 40 C.F.R. § 68.79(d) Compliance Audits

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.

- i. Rubicon failed to promptly determine and document an appropriate response to the 2019 compliance audit finding (#006) and document that the deficiency had been corrected. Rubicon neglected to perform and document that an incident investigation report was completed for each pressure relief device which failed to pop or failed to lift below 110% of its set pressure, as is required by the Rubicon mechanical integrity program. The 2019 recommendation required an investigation report be performed and corrective action completed. This recommendation had not been corrected at the time of the 2022 compliance audit, as of the date of the March 27, 2023 inspection, or the September 25, 2023 inspection. The target date for this compliance audit finding is December 9, 2023.
- ii. Rubicon failed to promptly determine and document an appropriate response for the 2019 compliance audit finding (#017) and document that the deficiency had been corrected. Rubicon failed to correct deficiencies in the

relief devices or the associated vent stacks in a safe and timely manner. This March 2019 recommendation requiring a correction in deficiencies had not been completed by the time of the 2022 compliance audit or by the date of the March 2023 or the September 2023 EPA RMP inspections.

iii. Rubicon failed to promptly determine and document an appropriate response to each of the following findings of the compliance audit.

a. Compliance audit recommendations (049DDR0322-012) - Develop a systematic process for updating relief documentation and implementing capital projects to stay current with code/regulatory requirements. Target Date March 8, 2025 - Timeline for this work will be developed is January 15, 2023.

b. Compliance audit recommendation (049DDR0322-014) (Target Date March 8, 2025, Top priority Item- No) Assessment: the facilities overall program has significant gaps, and actions to be implemented using a far more ready-made, fit for purpose solution that covers the full spectrum of requirements to satisfy regulatory ASME, API and RAGAGEP. The current platform and the functional support system does not adequately manage the PSV program. Several items have been found where current codes, practices, and RAGAGEP have not been applied. Progress report updates - none.

c. A 2019 compliance audit finding and recommendation for fire protection equipment addressed the failure to complete inspection repair recommendations which were occurring in multiple reports. During this RMP inspection, this finding and recommendation still has not been corrected.

d. Compliance audit recommendation (049DDR0322-011) No progress as of the March 2023 RMP inspection in determining an appropriate response to the finding. Target date Sept 8, 2024

e. Compliance audit recommendation (049DDR0322-013) Target Date March 8, 2025. Top priority Item-No.

f. Compliance Audit Recommendation (049DDR0322-017)(No progress as of the March 2023 RMP inspection in determining an appropriate response to the finding.

g. Compliance Audit Recommendation 049DDR0322-018) No progress as of the March 2023 RMP inspection in determining an appropriate response to the finding.

AOC 18 - 40 C.F.R. § 68.81(e) Incident Investigations

The owner or operator shall establish a system to promptly address and resolve the incident report findings and recommendations. Resolutions and corrective actions shall be documented.

i. Rubicon failed to establish a system to promptly address the report findings and recommendations associated with the January 15, 2022 incident (10742 Dechlorination Column Rupture Disc PSE-207 Activation) and implement appropriate resolutions and corrective actions to prevent the incident from recurring. As of March 2023, a review of the resolutions and corrective actions was still in progress.

ii. As of March 27, 2023, Rubicon failed to establish a system to promptly address and resolve the January 15, 2022 incident report's findings and recommendations (Action ID 17), implementing a (*long-term*) plan to address the location and design of relief device discharges identified as hazardous.

iii. During the 2019 EPA RMP inspection, the inspector identified that Rubicon had not established an effective system to address and resolve report findings and recommendations and document resolutions and corrective

actions taken. Rubicon had 24 incident action items that were past due.

AOC 19 - 40 C.F.R. § 68.95(a) Emergency Response Program

The owner or operator shall develop and implement an emergency response program for the purpose of protecting public health and the environment.

Rubicon failed to implement procedures contained in their emergency response plan. The Rubicon emergency response plan requires the facility to conduct an emergency drill annually. The November 2022 emergency drill was cancelled and at the time of this inspection the 2023 emergency drill had not been performed.

AOC 20 - 40 C.F.R. § 68.95(a)(4) Emergency Response Program

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 procedures to review and update, as appropriate, the emergency response plan to reflect changes at the stationary source and ensure that employees are informed of changes.

Rubicon failed to implement procedures contained in their emergency response plan. The Rubicon emergency response plan requires that an Administration Building Personnel Evacuation Checklist be maintained so in the event of an emergency, all employees who work in the building can be accounted for. The checklist was not being updated monthly and the September 2023 checklist included employees who had either retired or were no longer employed by Rubicon.

AOC 21 – Clean Air Act (CAA) § 112(r)(1) – The CAA General Duty Clause

Section 112(r)(1) states: Prevention of Accidental Releases (1) Purpose and General Duty - It shall be the objective of the regulations and programs authorized under this subsection to prevent the accidental release and to minimize the consequences of any such release of any substance listed pursuant to paragraph (3) or any other extremely hazardous substance. The owners and operators of stationary sources producing, processing, handling or storing such substances have a general duty, in the same manner and to the same extent as section 654, title 29 of the United States Code, to identify hazards which may result from such releases using appropriate hazard assessment techniques, to design and maintain a safe facility taking such steps as are necessary to prevent releases, and to minimize the consequences of accidental releases which do occur.

During an upset event on the MDI-1 Dechlorination Column system, the column's rupture disc (PSE-207) activated resulting in a loss of primary containment and release of approximately 200 lbs. of 400 °F methylene diisocyanate (MDI). The hot MDI discharged through the relief vent system and into an area on the ground floor, where 2 contract craftsmen were working on replacing a spare pump (PP4800A). Their maintenance work was unrelated to the column release. Both contractor employees were exposed to hot MDI, received second degree thermal burns, and were required to be hospitalized.

Rubicon failed to design and maintain a safe facility by not taking such steps as are necessary to ensure that atmospheric pressure relief devices due not activate and discharge to a location where personnel are present.

Rubicon failed to design a safe facility by not taking such steps as are necessary to ensure that engineering and administrative controls applicable to the hazard were in place to provide an early warning or activation of a rupture disk relieving to atmosphere at a ground location. Appropriate controls and detection methodologies might include process monitoring and control instrumentation with alarms and detection sensors.

Rubicon failed to maintain a safe facility by not taking such steps as are necessary to ensure that administrative controls applicable to the hazard were in place to minimize the consequences of accidental releases such as, but not limited to, signs, barriers, and a requirement for the use of appropriate personal protective equipment and respirators.

Section IV - FOLLOW UP

Additional information was requested following the March and September 2023 RMP inspections. Additional information may be requested if the inspector determines that there is additional information necessary, missing information, or documents that require clarification.

Section V - LIST OF APPENDICES

Not applicable.