

Region 6 - Enforcement & Compliance Assurance Division

INSPECTION REPORT

Inspection Date(s):	August 9-12, 2022	
Media Program:	Air	
Regulatory Program(s)	Clean Air Act Section 112(r) and 40 C.F.R. Part 68 Chemical Accident Prevention Provisions (Risk Management Plan)	
Company Name:	CITGO Petroleum Corporation – Refinery	
Facility Name:	CITGO Petroleum Corporation – Refinery	
Facility Physical Location:	1601 Highway 108 W	
(city, state, zip code)	Sulphur, Louisiana 70665	
Mailing address:	P.O. Box 1562	
(city, state, zip code)	Lake Charles, Louisiana 70602	
County/Parish:	Calcasieu Parish	
Facility Phone Number	(337) 708-6230	
Facility Contact:	Collin Castille	PSM Manager
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FRS Number:	110000597248	
Identification/Permit Number:	Air Operating Permit ID: 2920V2, 2935V3	
Media Identifier Number:	RMP ID: 1000 0014 0199	
NAICS:	32411 (Petroleum Refineries)	
SIC:	2911	
Personnel participating in inspection:		
Justin McDowell	US EPA Region 6	Inspector
Keri Meyers	LDEQ	Inspector
Jamie Vicknair	LDEQ	Inspector
Glen Jenkins	LDEQ	Inspector
Collin Castille	CITGO	PSM Manager
Chris McKee	CITGO	PSM Supervisor
Stephen Carrier	CITGO	APC Engineer
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Dan Pillsbury	CITGO	Manager / MS
John Fayko	CITGO	Operations
Jude Fox	CITGO	Electrician
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Sarah Wrobel	CITGO	Operations Manager
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Phyllis Holifield	CITGO	Environmental Manager
Sterling Neblett	CITGO	Vice President & General Manager

EPA Lead Inspector Signature/Date		
	Justin McDowell	Date
Supervisor Signature/Date		
	Samuel Tates	Date

Section I – INTRODUCTION

PURPOSE OF THE INSPECTION

I, United States Environmental Protection Agency (EPA) Region 6 inspector Justin McDowell, along with the Louisiana Department of Environmental Quality (LDEQ) inspectors Keri Meyers, Jamie Vicknair, and Glen Jenkins, arrived at the CITGO Petroleum Corporation Refinery (CITGO) at 9:30 AM on Tuesday, August 9, 2022, for an announced inspection. I met with CITGO representatives for an opening meeting. I presented my credentials and informed CITGO 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 assessment of the facility's compliance with the Clean Air Act (CAA) Section 112(r)(1), the General Duty Clause, and CAA 112(r)(7) the Chemical Accident Prevention Provisions in 40 C.F.R. Part 68. CITGO's Risk Management Plan (RMP) is listed as a Program Level Three (3), Title V facility. Two union representatives (representing machinist, operators, and clerical staff) participated in this inspection as an employee representative, pursuant to section 112(r)(6)(L) of the CAA.

FACILITY DESCRIPTION

CITGO's Lake Charles Manufacturing Complex, located in Lake Charles, Louisiana, operates a variety of refining and chemical processes to produce petroleum products from raw crude oil. The refinery has regulated flammables, such as, but not limited to, methane, ethane, propane, pentane, propylene, hydrogen, and butane. The refining process also includes management of regulated toxic materials including hydrogen sulfide and ammonia. This manned facility operates 24 hours a day and 7 days a week. The site has approximately 1,083 full time employees and also has nested contractors.

Section II – OBSERVATIONS

On Tuesday, August 10, 2022, EPA and LDEQ inspectors were accompanied by CITGO personnel to conduct a tour of the facility, focusing on the C-4 Recovery Unit, the Alkylation Unit, and both control rooms. The C-4 Recovery Unit extracts valuable liquid products from the combined gas and distillate feed streams provided by various refinery units. While reviewing piping and instrument diagrams (P&IDs) A-50724 and A-50725, the inspectors could smell ammonia in the vicinity of the C23A-F condensers. We were later informed of an ammonia leak on a control valve bonnet, which was managed pursuant to CITGO's LDAR program. Condenser 23F did not have a name plate. The alkylation unit at CITGO uses sulfuric acid and in the conversion process in the refinery processes.

Subpart A – General

40 C.F.R. § 68.10 Applicability – CITGO is the owner/operator of a stationary source that has more than a threshold quantity of a regulated toxic substance (anhydrous ammonia) and more than a threshold quantity of a regulated flammable substances (flammable mixtures) in its covered processes, as listed at 40 C.F.R. § 68.130; therefore, CITGO is subject to the Chemical Accident Prevention Provisions. CITGO is classified under the North American Industrial Classification System (NAICS) codes 32411 (Petroleum Refineries). CITGO is subject to the Occupational Safety and Health Administration (OSHA) process safety management (PSM) standard, 29 C.F.R. § 1910.119.

40 C.F.R. § 68.10 Program Eligibility – CITGO re-submitted its RMP registration and revised offsite consequence analysis (OCA), due to a change pursuant to 40 C.F.R. § 68.190 (b)(6), on February 21, 2018. CITGO's next registration re-submittal is due on February 21, 2023, unless an update or correction is required by 40 C.F.R. § 68.190 or 40 C.F.R. § 68.195 prior to the five-year renewal date.

40 C.F.R. § 68.12 General requirements – CITGO's RMP submission 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 - § 68.67; develop and implement an emergency response program; and include the data elements from 40 C.F.R. § 68.175 in their RMP.

40 C.F.R. § 68.15 Management – CITGO has developed a management system to oversee the implementation of risk management program elements and documented the lines of authority defined through an organization chart and a roles and responsibilities chart.

Subpart B – Hazard Assessment

40 C.F.R. § 68.20 Applicability – CITGO has thirty-five (35), Program Level 3 processes subject to this subpart. The facility is required to prepare an OCA for both toxics and flammables and complete the five-year accident history.

40 C.F.R. § 68.22 Offsite Consequence Analysis Parameters – CITGO stated they used RMP*Comp™ as the technique for modeling the 2018 release scenarios in the RMP. For both the worst-case and alternative case scenarios involving flammables, the facility used the endpoints provided in Appendix A of 40 C.F.R. Part 68, 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.

40 C.F.R. § 68.25 Worse-case Release Scenario Analysis – CITGO analyzed and reported in the 2018 RMP one worst-case release scenario (WCS), estimated to create the greatest distance in any direction to an endpoint and resulting from an accidental release of a regulated toxic substances from covered processes under worst-case conditions. CITGO also reported one worst-case release scenario, estimated to create the greatest distance to endpoint and resulting from an accidental release of a regulated flammable substance from a covered process under worst-case conditions.

The information reported in the 2018 submittal does not match the information that was in the 2014 submittal. The two have discrepancies, including the amount released. In 2018, the toxic worst-case scenario, C-4 Cats, for ammonia (anhydrous) is listed as a gas liquefied by pressure used in RMP*Comp™. It describes a total quantity of 180,000 lbs. and a release scenario of 18,000 lbs. per minute for ten minutes resulting in a distance to endpoint of 3.6 miles (population impact 17,000). The

June 2014 RMP Comp release scenario summary also documents an ammonia release. The 2014 release is of 40,000 lbs. per minute for ten minutes with no mitigation measures resulting in a distance to endpoint of 3.6 miles (population impact 16,578). The facility did not state a mitigation measure or any administrative controls in the 2018 RMP Submittal. CITGO stated they the facility has administrative controls for the ammonia to not exceed 40000 lbs. when reordering. The C4 Recovery Unit Ammonia Re-Order Limits procedure (SOP-319-308; original effective date of 6/21/99; Rev. No.1) has a statement that states, "When re-ordering aqueous ammonia for the make-up system of the York Refrigeration System (specifically the 319F53 Ammonia Drum), do not exceed the re-order quantity over 40,000 lbs. While running the scenarios onsite with the 2018 data, the worst-case distance to endpoint is 5.0 miles. The population variance from 5.0 miles is 40,237 compared to 3.6 miles and 16,578 in 2014 and 17,000 in 2018. [AOC 1 - 68.25 (a)(2)(i)]

40 C.F.R. § 68.28 Alternative Release Scenario Analysis – CITGO identified and analyzed at least one alternative release scenario for each regulated toxic substance held in covered processes and at least one alternative release scenario to represent all flammable substances held in covered processes.

40 C.F.R. § 68.30 Defining Off-site Impacts - Population – CITGO did not have any population documentation from the 2018 submittal, nor did they state what was used to determine population. The estimated population provided did not match the population used during the inspector's calculation using the same data provided in the RMP. The population variance from 5.0 miles is 40,237 compared to 3.6 miles and 16,578 using Circular Area Profiling System (CAPS) with the 2010 census data in 2014 and 17,000 in 2018. The residential population is stated in the RMP submittal; however, CITGO was not able to tell me how they obtained those numbers for the population. Because of the varying worst-case scenarios for ammonia results in a different distance to endpoint, there is a greater population potentially affected. [AOC 2 - 68.30 (a)]

40 C.F.R. § 68.33 Defining Off-site Impacts - Environment – CITGO has not identified environmental receptors in the OCA within a circle, where the center is the point of the release and included in the circle radius, as determined by the distance to endpoint using methods such as local U.S. Geological Survey (U.S.G.S.) maps or any other data source containing U.S.G.S. data to identify environmental receptors. [AOC 3 - 68.33 (a)]

40 C.F.R. § 68.36 Review and Update – CITGO has not reviewed and updated the off-site consequence analyses at least once every five years based on the inaccuracies and lack of documentation. [AOC 4 - 68.36 (a)]

40 C.F.R. § 68.39 Documentation – CITGO only provided documentation from the 2018 RMP submittal. There was no other supporting documentation from the 2018 submittal. No RMP*Comp data of the scenarios ran was provided. There was no backup documentation for the worst-case or alternate release scenarios. The facility provided documentation of the information that was ran in 2014 for the previous RMP Submittal. The information that is in the 2018 submittal does not match all the information that was in the 2014 submittal. There are discrepancies, including the amount released. The facility is considering having a third-party come in to help with the hazard assessment documentation and start from scratch. CITGO states they used RMP*Comp on the RMP Submittal, though no documentation was provided to back up the scenarios. They also could not explain how I got a different distance to end point for the ammonia WCS using the parameters that they used in their RMP Submittal. [AOC 5 - 68.39 (a)(b)(c)(d)(e)]

40 C.F.R. § 68.42 Five-year accident history – CITGO has not included 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. On June 12, 2020, the facility had an operator injury resulting in a hydrogen sulfide (H₂S) exposure in the Coker II unit. **[AOC 6 - 68.42 (a)]**

Subpart D – Program 3 Prevention Program

40 C.F.R. § 68.65 Process Safety Information – CITGO compiled 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 process chemicals (alkylate, sulfuric acid, ammonia (anhydrous), and cat gasoline) used and produced that contains the following data for the hazards of each substance: 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. For the C-4 and Alkylation units, I reviewed documentation concerning the technology of the covered processes, which included block flow diagrams, process chemistry, maximum intended inventory, safe upper and lower limits for such items as temperatures, pressures, flows, or compositions and an evaluation of the consequences of deviation. CITGO's plant information center (PIC) documents and maintains standard operation limits (SOL). The process safety information being stored in EDMS is well documented and organized in the facility drawings. Each unit has digital sketch drawings that are used for pulling inspection plans and documentation.

I reviewed documentation pertaining to the equipment of each process, including materials of construction, electrical classification, process safety valve (PSV) relief system design, design basis, design codes and standards employed, material and energy balances (for C-1 constructed in 2005), and other safety systems. CITGO's gas detection in the alkylation unit has set points of 10 parts per million (ppm) for all alarms within the unit. During the facility tour, the inspection team reviewed the following piping and instrumentation diagrams (P&IDs): A-50724 (P&ID Update Project C23A-F Low Press. Gas Condenser) and A-50725 (P&ID Update Project F8 Feed Flash Drum). These two P&IDs were inaccurate by both having equipment documented on the P&ID that was not present in the field, as well as, having items not documented on the P&ID but present in the field. **[AOC 7– §68.65 (d)(1)(ii)]**

40 C.F.R. § 68.67 Process hazard analysis (PHA) – CITGO performed initial PHAs that identified, evaluated, and controlled the hazards involved in the processes. The facility completes each PHA based on the five-year cycle from the previous PHA. The PHA is divided among the covered process units/work areas. The PHAs performed use the Hazard and Operability Study (HAZOP) technologies to identify hazards. The PHAs reviewed addressed the hazards of the process; identification of any incident that had a likely potential for catastrophic consequences; engineering and administrative controls applicable to hazards and their interrelationships; consequences of failure of engineering and administrative controls; stationary source siting; human factors; and a qualitative evaluation of a range of the possible safety and health effects of failed controls. PHAs were performed by a team with expertise in engineering and process operations and included at least one employee who has experience and knowledge specific to the process being evaluated. The 2018 C4 Unit Revalidation PHA participants included Susan Broussard (Facilitator Citgo), Kristin Prejean and Mark Bergeron (Unit Supervisors), Steve Morris and Robbie Trahan (Operations), Jamie Maddie and Jay Rewerts (OED Engineers), Sebastian Vargas, Austin Beall, Stefan Smith, and Joshua Baham (FER - Fixed Equipment Reliability Engineers), and

Lindsay Gilley (Scribe - ReCon Engineering). The 2017 Alky Unit Revalidation PHA participants included Chris Ebersole (Facilitator Recon Engineering), James Ferro, Richard Doss, John Sandvick (Process Engineers), Dennis Landry (Operations), Sherwin Roy (Unit Supervisor), Austin Beall (FER), Lindsay Gilley (Scribe - ReCon Engineering). CITGO has not established 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. The 2017 Alky Revalidation PHA action item number six is still open. The parent action item was closed on November 15, 2021, and a child action item was created November 9, 2021 – Action Item 100343634. The child recommendation has a completion date of February 9, 2022. It was closed on an error according to the facility. **[AOC 8 – §68.67(e)]** There is an engineering work request, which was initiated February 3, 2022, that has an implementation date proposed of November 15, 2026, for a capital project. CITGO stated that they need two years to get funding for capital projects. Funding for this project should have come through in 2019, to complete remaining action items. The C4 PHA was revalidated on April 1, 2013, and August 9, 2018 (4 months late). Table 1 shows additional PHAs not revalidated at least every five years. **[AOC 9 – §68.67(f)]** Two findings from the 2018 C4 revalidation PHA were not tracked in impact. **[AOC 10 – §68.67(g)]**

Table 1 - PHAs NOT revalidated at least every five years - [AOC 9 – §68.67(f)]	
PHA	Revalidation Dates
2020 B Topper Hazop Report (302/1 (B) B-Topper)	November 2, 2020
2015 B Topper Unit Revalidation (302/1 (B) B-Topper)	July 13, 2015
2021 A Reformer Hazop Report (301/1 (A) A-Topper)	April 19, 2021
2016 A-Reformer Hazop Revalidation Project (315/10 A-Reformer)	May 12, 2014
2021 Vacuum PHA Report (309/13 Feed Prep)	January 18, 2021
2015 Vacuum Revalidation (309/13 Feed Prep)	September 14, 2015
2021 Central Amine Hazop Report (314/20G Central Amine)	April 19, 2021
2016 Central Amine Hazop Revalidation Report (314/20G Central Amine)	April 4, 2016
2020 Intermediate Tank Farm (North Pressure Area/ South Pressure Area (343/348))	July 7, 2020
2015 Intermediate Tank Farm Revalidation Report (North Pressure Area/ South Pressure Area (343/348))	May 18, 2015
2018 Topper Tail Gas Hazop Revalidation (304/ 1A TTG-JC36)	December 10, 2018
2013 Topper Tail Gas Revalidation Hazop Report (304/ 1A TTG-JC36)	July 15, 2013
C4 PHA	August 9, 2018
C4 PHA	April 1, 2013

40 C.F.R. § 68.69 Operating Procedures – CITGO has developed and implemented written operating procedures that provide clear instructions for safely conducting activities involved in each covered process consistent with the process safety information and that addressed the required elements. CITGO has also developed and implemented safe work practices to provide for the control of hazards during operations such as lockout/tagout and confined space entry. The procedures consisted of steps

for each operating phase: initial startup; normal operations; temporary operations; emergency shutdown, including the conditions under which emergency shutdown is required, and the assignment of shutdown responsibilities to qualified operators to ensure that emergency shutdown is executed in a safe and timely manner; emergency operations; normal shutdown; and, startup following a turnaround, or after an emergency shutdown. The following procedures were reviewed: *Emergency Shutdown #EOP-328.1-501 (Alkylation Unit)*, *Loss of All Central Control Room Experion Console Stations #EOP-319-514*, *C-Cat Actions for C4-Recovery Emergency Shutdown #EOP-318-111*, *C4 Recovery Unit Start-up Following Turnaround #SOP-319-101*, *C4-Recovery Shutdown for Turnaround #SOP-319-102*, *C4_Recovery Start-up Following Emergency Shutdown #SOP-319-107*, *319E12 Depropanizer Start-up #SOP-319-108*, *Tank Truck Unloading #SOP-319-302*, *Process Pumps Maintenance/Inspection Preparation #SOP-319-401*, *Compressor Maintenance/Inspection Preparation #SOP-319-403*, *Alkylation Unit Start-up #SOP-328.1-101*, *Shutdown for Turnaround #SOP-328.1-102*, *Alky Shutdown to Standby #SOP-328.1-105*, *Alky Startup from Standby #SOP-328.1-106*, *328E104 Depropanizer Startup Following Turnaround #SOP-328.1-108*, *Turbine Driven Pump Operation #SOP-328.1-202*, *328D(T) 1/2/3/4 Contactor Operation #SOP-328.1-205*, *Butane Handling Unit Startup Following Emergency Shutdown #SOP-328-102*, *Confined Space Entry #SIH-397-105*, *Hot Work Permits #SIH-397-103*, *Electrical Lockout #SIH-397-110*, and *Hazardous Energy Control #SPS-124*. Consequences of deviation and steps required to correct or avoid deviation are found in the PIC (Plant Information Center). CITGO uses the Flag Report Dashboard to see the individual safe operating limits and consequences of deviations. Properties of and hazards presented by the chemicals used in the process and control measures to be taken if physical contact or airborne exposure occurs are covered by a reference in the SOP to review the SDSs or the Operations Manual for each unit. PPE is covered in Section 3.0 and/or Section 4.0 of the procedures. Safety Systems and their functions are referenced in the procedure to go to Appendix C of each unit's Operations Manual. Operators have access to procedures in the CITGO EDMS. Procedures reviewed have been certified annually. If the procedure is updated between certifications, the certification date is reset to be one year after the update date.

40 C.F.R. § 68.71 Training – CITGO gave an overview of their training program. The facility brings in a class of approximately fifteen new operators at a time. The new operators begin a basic operator training program that lasts approximately 10 weeks and consists of: personal protective equipment, safety permit training, emergency response, and a unit drawing overview. Each segment of training builds on the previous. So, once the operator is familiar with the unit, they can proceed to being tested. Operators are progressed based on a pass/ fail rating from unit supervisors. The operators then proceed to a week of on-the-job (OTJ) training on day and night shifts and are paired with an experienced, qualified operator. CITGO makes an effort to ensure each operator is trained to at least up and down one level from the operator current qualified job. Refresher training uses the same packet standard as initial training. Frequency of refresher training is on the recertification of the training packet. This documents that the operator feels they have adequate training, understand the job, and the training is satisfactory. Fourteen operators (seven from the alkyl unit-butane and seven from C-4 recovery unit) were selected for review of their training records.

40 C.F.R. § 68.73 Mechanical Integrity – CITGO provided the overall mechanical integrity procedure (SIH-397-250) of how the facility established and implemented written procedures to maintain the on-going integrity of process equipment. Additional procedures were provided: Inspection of Process Shell and Tube Heat Exchangers and Double Pipe Heat Exchangers (ISP-378-201), Inspection Recommendation Procedure (ISP-378-304), Pipe External Inspection and Thickness Monitoring for Piping & Pressure Vessels (ISP-378-300), Pressure Vessel Repair Authorization/ Acceptance (ISP-378-303), Rotating Equipment PM & Maintenance (M-589-0001), Rotating Equipment Pump Functional Location Mechanical Preventive Maintenance and Inspection (ADM-394-203), Rotating Equipment – Vibration Monitoring Procedure (QA-394-200)

The inspection team consists of four row crews: UT/RT, 1 RT crew, ten onstream UT techs, two tank inspectors, two transfer pipe inspectors, three sketchers, fifteen carpenters, and seventeen CITGO inspectors. CITGO inspectors have completed maintenance training certifications and contractor employees arrive onsite with API certifications. The Intelex database system is for documentation of maintenance activities. For rotating equipment such as pumps, Intelex produces field work orders. Operators have daily rounds that include checking lubrication, preventative maintenance for operators to perform or replace lubrication, replenish and/or replace oil that mechanics will perform. CITGO has risk-based inspections (API 580) implemented on two units (314-2 central amine and 311-5 splitter unit inside sulfur). The facility does not conduct risk-based inspections (RBI) on piping circuits, only pressure vessels. Several vessels are extended beyond the recommended time-based and some are shortened. Approximately 100 vessels are currently in RBI program. CITGO employees and contractors are API 580 certified. Becht and Mistras are third party companies utilized to facilitate RBI in plant control management system (PCMS). All other equipment is maintained by time-based inspections (API 510, 570, and 653). CITGO has underground piping containing process chemicals. The equipment on stream monitors internal corrosion and treats underground piping same as above ground piping. The facility has a process to excavate soil and inspect air interface to monitor issues. Relief valves (PSVs) are also maintained in PCMS. Most PSVs are on a 5-year inspection plan but may decrease depending on the service. SAP maintenance program provides notifications to have valves pulled by test dates. Control work (contractor company) does pop test function location numbers and PSVs are serviced offsite. Most locations have dual PSVs.

CITGO stated they have approximately 150 pipe clamps/wraps currently installed. When a clamp/wrap is installed, it is assigned corrosion monitoring location (CML) identification, a PCMS recommendation, and tracking for removal of the clamp/wrap. There are over 250,000 CMLs at the facility.

CITGO has an inspection deferral program. Deferrals are only used in specific circumstances. CITGO stated that all inspections are currently up to date. CITGO has an ongoing onstream system to remove dead legs inside the facility. Dead legs are inspected using x-ray.

I requested the following maintenance documentation: relief valve list, deferral equipment list, list of overdue inspections, records on gas detectors (H2S and ammonia), the deluge system, and a list of pipe clamps/wraps along with installation dates. The following equipment records were requested: D11, E1, E10, E12, E7, E8, C23, C151, as well as associated PSVs. I was not provided the following documentation: deferral equipment list, list of overdue inspections, records on gas detectors (H2S and ammonia), the deluge system, and a list of pipe clamps/wraps along with installation dates. **[AOC 11 – §68.73(d)(1)]**

Table 2 -Fixed Equipment [AOC 12 – §68.73(d)(3)]		
Equipment Type/Equipment ID	External Inspection Date	Internal Inspection Date
C4 Recovery 319 3-319001 001: From C103 A&B to E10 Tower	2/15/1997 External	
	1/21/2003 External	4/20/2006 TML
	6/23/2006 External	2/23/2011 TML
	6/14/2011 External	10/12/2015 TML
	7/12/2016 External	11/1/2016 CUI
	7//2021 External	4/20/2017 CML
		7/9/2020 TML
C4 Recovery 319 3-319C23A LP. CAT GAS/WATER TE [CONDENSER]	1/27/2022	2/28/2017
	7/28/2016	3/1/2007
C4 Recovery 319 3-319E10	1/31/2022	3/25/2017
	5/12/2016	3/5/2007
	4/25/2012	
C4 Recovery 319 3-319F8	1/4/2022	4/19/2017
	6/27/2016	3/14/2007
	1/16/2012	
C4 Recovery 319 3-319PSV148	7/29/2022	
	10/28/2020	
C4 Recovery 319 3-319PSV161	1/29/2021	
	3/30/2016	
C4 Recovery 319 3-319PSV162	2/21/2022	
	3/20/2017	
C4 Recovery 319 3-319PSV163	2/2/2021	
	3/6/2016	
C4 Recovery 319 3-319PSV233	3/28/2022	
	7/28/2021	
C4 Recovery 319 3-319PSV235	3/9/3022	
	10/21/2020	
C4 Recovery 319 3-319PSV235 / C4 Recovery 319 3-319PSV236	12/15/2020	
	1/28/2019	
C4 Recovery 319 3-319PSV241	8/8/2018	
	8/12/2013	

The following equipment inspection frequencies were not consistent with applicable manufacturers' recommendations and good engineering practices per the five-year API guidelines: C4 Recovery 319 3-319C23A LP. CAT GAS/WATER TE [CONDENSER], C4 Recovery 319 3-319E10 and C4 Recovery 319 3-319F8. [AOC 12 – §68.73(d)(3)]

40 C.F.R. § 68.75 Management of Change (MOC) – CITGO has established written procedures to manage changes, except for “replacements in kind”, to process chemicals, technology, equipment, procedures, and to changes to stationary sources that affect a covered process. The procedures outline

the necessary considerations and are addressed prior to any change. Temporary MOCs are 180 days. The following MOCs were requested and reviewed:

Table 3 - CITGO Petroleum Corporation Refinery – MOCs selected in C4 and Alky Units	
Alkylation Unit MOCs	C-4 Unit MOCs
1. MOC.2022.012414	1. MOC.2022.010950
2. MOC 368779	2. MOC 378770
3. MOC 375805	3. MOC 378790
4. MOC 378558	4. MOC 391442
5. MOC 378576	5. MOC 409608
6. MOC 378578	
7. MOC 378579	
8. MOC 385926	

40 C.F.R. § 68.77 Pre-startup Safety Review (PSSR) – I reviewed selected PSSR records and the associated MOCs. 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 regulated substances, including the appropriate communication elements and training.

40 C.F.R. § 68.79 Compliance Audits – CITGO certified that they evaluated compliance with the provisions of this subpart at least every three years to verify that procedures and practices developed under this subpart are adequate and are being followed on July 24, 2017, and June 1, 2020. Each compliance audit was conducted by at least one person knowledgeable in the process. The 2020 compliance audit noted 3 PHA findings: PHA-01, MI-01, and RMP-G-01; however, under the compliance audit section they note: “NO NEW FINDINGS”. A finding should be present for 68.79(d) – failure to promptly determine and document an appropriate response to each of the findings of the compliance audit, and document that deficiencies have been corrected because the audit notes that items from the 2017 audit are currently still open and have target dates for completion that extend several years. CITGO failed to promptly determine and document an appropriate response to each of the findings of the compliance audit and that any deficiencies have been corrected. The 2017 audit has 7 action items open beyond the due dates. **[AOC 13 – § 68.79 (d)]**

40 C.F.R. § 68.81 Incident Investigation – I reviewed the facility’s Incident Reporting and Investigation Procedure (SIG-397-161). CITGO only provided one incident that met their criteria under 40 C.F.R. §68.81, which involved an oil pump fire in the Coker II unit. This incident had an investigation initiated no later than 48 hours following the incident. The investigation team consisted of at least one person knowledgeable in the process involved, including a contract employee if the incident involved work of the contractor, and other persons with appropriate knowledge and experience, to thoroughly investigate and analyze the incident.

40 C.F.R. § 68.83 Employee Participation – CITGO has developed a written plan of action regarding the implementation of employee participation required by this section, which is integrated into the program elements (CITGO Petroleum Corporation Lake Charles Manufacturing Complex Employee Participation in Process Safety Management, HR-384-7, Rev. No. 7).

40 C.F.R. § 68.85 Hot Work Permit – CITGO provided its hot work policy (Hot Work, #SIH-397-103). The following hot work permits were reviewed: #632220, #586483, #633961, #634104, #634733, #630515,

#630512, #674356, #548912, and #407299. Permits #630515, #630512, and #407299 failed to identify the object on which hot work is to be performed. [AOC 14 – §68.85(b)]

Table 4 - Hot Work Permits	
#630515	C-4 unit, Equipment #: Bypass line (hot gas). CITGO stated there would be many bypass lines within the unit so this does not identify the equipment on which hot work will be performed.
#630512	C-4 unit, Equipment #: (left blank). Grind on pipe to prepare for weld. Weld repad and support to pipe (pipe not identified). Air monitoring and fire watch performed. Signed off after work complete.
#407299	C-4 unit, Equipment #: (left blank). Cut tacks on shoe with grinder and buff weld with wire wheel using welding machine for power. Air monitoring and fire watch performed. Signed off after work complete.

40 C.F.R. § 68.87 Contractors – CITGO provided the following contractor policies: PSM: Contractors – regulatory requirements for using contractors; Contractor Safety Orientation, #SIH-397-1171 – Outlines the training requirements for contractor employees; and Contractor Review Protocol, #ADM-397-0002 – Establishes the methodology (ISNetworld) for reviewing contractors at the CITGO Petroleum Corporation, Lake Charles Complex. CITGO uses *ISNetworld* to evaluate contractors before hiring them to come on-site. Contractor's grades of an A (good to perform work onsite), B (deficiencies, but can work without waiver), and C (requires waiver). If the contractor has had a fatality or incident, it requires a pre-meeting to discuss if the company will proceed with them. Contractor employees receive Basic Plus, CITGO Site Specific, and emergency response training through the Safety Council of Southwest Louisiana in Lake Charles. Some contractors (Performance) will receive the CITGO site-specific refresher training on-site instead of going back to the safety council. Contract employees are given an ID badge that is used to scan in at the contractor gate. CITGO's site-specific training and transportation workers identification card (TWIC) has expiration dates that are tied to the ID badge. If either of those expire, gate access is denied. Contractors are periodically evaluated through the review of safe work permits and job safety analysis (JSA) audits. The Field Review Guide is also used by operators to evaluate contract employees, while working on-site. The A-Team hazard recognition program rewards contractors that alert management of contract workers who are not working safely while on-site. Contractors must be re-evaluated at least once every three years.

Subpart E – Emergency Response

40 C.F.R. § 68.90 Applicability – CITGO is designated as a responding stationary source.

40 C.F.R. § 68.93 Emergency Response Coordination Activities – CITGO provided coordination activity via an email that was sent to the Calcasieu Parish Office of Homeland Security and Emergency Preparedness (OHSEP) by Mr. Jackson on August 9, 2022. This email asked if the flash drive of CITGO's emergency response plan was received by an OSHEP representative. Mr. Jackson stated that he went to drop off the plan to OHSEP but no one was there to receive the flash drive. So, he left it on the OSHEP representative's desk.

40 C.F.R. § 68.95 Emergency Response Program – CITGO has developed and implemented an emergency response program for the purpose of protecting public health and the environment. Procedures for informing the public and the appropriate federal, state, and local emergency response agencies about accidental releases was documented on the Citgo Petroleum Corporation Lake Charles Manufacturing Complex Release Notification Form. State Police, Hazmat, NRC, LDEQ, LEPC (911), Citgo hotline, DNR, ORSO (spills to water only), and local coast guard are notified. Rural Metro is CITGO's firefighting team that has at least six members on-site, 24 hours a day). A percentage of Citgo operators are trained to be a part of the emergency response team. CITGO provided the advance life support and basic life support 2.2 Medical, Figure 2.2.1 – medical response checklist document. I requested the following fire equipment records: fire engine #2, fire pumps, and fire hoses. Emergency response team members are required to have the following trainings to remain certified: fire brigade, HAZMAT, rescue, and industrial hygiene response teams (air monitoring for air emergencies). I requested initial training and the most recent refresher training for six members. The emergency response plan (ERP) will be reviewed and updated at least annually or when necessary to reflect changes in procedures, phone numbers, regulatory mandates, and changes in employee responsibilities. Changes in the plan will be reviewed with all affected personnel during the training session held at least annually or whenever necessary due to changes in response procedures, responsibilities, and or equipment. Employees have access to the emergency response plan by going to the facility intranet and logging into Smart Plan to review the Emergency Management Plans Section that leads to the ERP.

40 C.F.R. § 68.96 Emergency Response Exercises – CITGO provided documentation that the facility will conduct emergency response drills in coordination with local emergency planning and response organizations.

Subpart G – Risk Management Plan

40 C.F.R. § 68.190 Updates – CITGO's RMP was re-submitted on February 21, 2018, after a revised OCA due to a change pursuant to 40 C.F.R. § 68.190(b)(6).

40 C.F.R. § 68.195 Required corrections – CITGO next RMP registration re-submission is due by February 21, 2023, unless an update or correction is required by 40 C.F.R. § 68.190 or 40 C.F.R. § 68.195 prior to the five-year renewal deadline.

Closing Meeting- On the last day of the inspection (August 12, 2022), I conducted a closing conference, during which I presented the following areas of concern identified during the inspection.

Section III – AREAS OF CONCERN

AOC 1 – 40 C.F.R § 68.25(a)(2)(i) Worst-case release scenario analysis

“(a) The owner or operator shall analyze and report in the RMP: (2) For Program 2 and 3 processes: (i) One worst-case release scenario that is estimated to create the greatest distance in any direction to an endpoint provided in appendix A of this part resulting from an accidental release of regulated toxic substances from covered processes under worst-case conditions defined in § 68.22.”

The information reported in the 2018 submittal does not match the information that was in the 2014 submittal. The two have discrepancies, including the amount released. In 2018, the toxic worst-case scenario, C-4 Cats, for ammonia (anhydrous) is listed as a gas liquefied by pressure used in RMP*Comp™. It describes a total quantity of 180,000 lbs. and a release scenario of 18,000 lbs. per minute for ten minutes resulting in a distance to endpoint of 3.6 miles (population impact 17,000). The June 2014 RMP Comp release scenario summary also documents an ammonia release. The 2014 release is of 40,000 lbs. per minute for ten minutes with no mitigation measures resulting in a distance to endpoint of 3.6 miles (population impact 16,578). The facility did not state a mitigation measure or any administrative controls in the 2018 RMP Submittal. CITGO stated they the facility has administrative controls for the ammonia to not exceed 40000 lbs. when reordering. The *C4 Recovery Unit Ammonia Re-Order Limits* procedure (SOP-319-308; original effective date of 6/21/99; Rev. No.1) has a statement that states, “When re-ordering aqueous ammonia for the make-up system of the York Refrigeration System (specifically the 319F53 Ammonia Drum), do not exceed the re-order quantity over 40,000 lbs. While running the scenarios onsite with the 2018 data, the worst-case distance to endpoint is 5.0 miles. The population variance from 5.0 miles is 40,237 compared to 3.6 miles and 16,578 in 2014 and 17,000 in 2018.

AOC 2 – 40 C.F.R § 68.30(a) Defining offsite impacts – population

“(a) The owner or operator shall estimate in the RMP the population within a circle with its center at the point of the release and a radius determined by the distance to the endpoint defined in § 68.22(a).”

CITGO did not have any population documentation from the 2018 submittal, nor did they state what was used to determine population. The estimated population provided did not match the population used during the inspector’s calculation using the same data provided in the RMP. The population variance from 5.0 miles is 40,237 compared to 3.6 miles and 16,578 using Circular Area Profiling System (CAPS) with the 2010 census data in 2014 and 17,000 in 2018. The residential population is stated in the RMP Submittal; however, CITGO was not able to tell me how they obtained those numbers for the population. Because of the varying worst-case scenarios for ammonia results in different distance to endpoints, there is a greater population potentially affected.

AOC 3 – 40 C.F.R § 68.33(a) Defining offsite impacts – environment

“(a) The owner or operator shall list in the RMP environmental receptors within a circle with its center at the point of the release and a radius determined by the distance to the endpoint defined in § 68.22(a) of this part.”

CITGO has not identified environmental receptors in the OCA within a circle where the center is the point of the release and included in the circle radius, as determined by the distance to endpoint using methods, such as local U.S. Geological Survey (U.S.G.S.) maps or any other data source containing U.S.G.S. data to identify environmental receptors.

AOC 4 – 40 C.F.R § 68.36(a) Review and update

“(a) The owner or operator shall review and update the offsite consequence analyses at least once every five years.”

CITGO has not reviewed and updated the off-site consequence analyses at least once every five years based on the inaccuracies and lack of documentation.

AOC 5 – 40 C.F.R § 68.39(a) Documentation

“(a) For worst-case scenarios, a description of the vessel or pipeline and substance selected as worst case, assumptions and parameters used, and the rationale for selection; assumptions shall include use of any administrative controls and any passive mitigation that were assumed to limit the quantity that could be released. Documentation shall include the anticipated effect of the controls and mitigation on the release quantity and rate.”

“(b) For alternative release scenarios, a description of the scenarios identified, assumptions and parameters used, and the rationale for the selection of specific scenarios; assumptions shall include use of any administrative controls and any mitigation that were assumed to limit the quantity that could be released. Documentation shall include the effect of the controls and mitigation on the release quantity and rate.”

“(c) Documentation of estimated quantity released, release rate, and duration of release.”

“(d) Methodology used to determine distance to endpoints.”

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

CITGO only provided documentation from the 2018 RMP submittal, there was no other supporting documentation from the 2018 submittal. No RMP*Comp data of the scenarios were provided. There was no backup documentation for the worst-case or alternate release scenarios. The facility provided documentation of the information that was ran in 2014 for the previous RMP Submittal. The information that is in the 2018 submittal does not match all the information that was in the 2014; they have discrepancies, including the amount released. The facility is considering having a third-party come in to help with the hazard assessment documentation and start from scratch. CITGO states they used RMP*Comp on the RMP Submittal, though no documentation was provided to back up the scenarios. They also could not explain how I got a different distance to endpoint for the ammonia WCS using the parameters that they used in their RMP Submittal.

AOC 6 – 40 C.F.R § 68.42(a) Five-year accident history

“(a) 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.”

CITGO has not included 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. On June 12, 2020, the facility had an operator injury resulting in a hydrogen sulfide (H₂S) exposure in the Coker II unit.

AOC 7 – 40 C.F.R § 68.65(d)(1)(ii) Process safety information

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

A-50724

A-50725

During the facility tour, the inspection team reviewed the following piping and instrumentation diagrams (P&IDs): A-50724 (P&ID Update Project C23A-F Low Press. Gas Condenser) and A-50725 (P&ID Update Project F8 Feed Flash Drum). These two P&IDs were inaccurate by both having equipment documented on the P&ID that was not present in the field, as well as having items not documented on the P&ID but present in the field.

AOC 8 – 40 C.F.R § 68.67(e) Process Hazard Analysis

“(e) 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.”

The 2017 Alky Revalidation PHA action item number six is still open. The parent action item was closed on November 15, 2021, and a child action item was created November 9, 2021 – Action Item 100343634. The child recommendation has a completion date of February 9, 2022. It was closed in error, according to the facility.

AOC 9 – 40 C.F.R § 68.67(f) Process Hazard Analysis

“(f) At least every five (5) years after the completion of the initial process hazard analysis, the process hazard analysis shall be updated and revalidated by a team meeting the requirements in paragraph (d) of this section, to assure that the process hazard analysis is consistent with the current process. Updated and revalidated process hazard analyses completed to comply with 29 CFR 1910.119(e) are acceptable to meet the requirements of this paragraph.”

PHAs NOT revalidated at least every five years - [AOC 9 – §68.67(f)]	
PHA	Revalidation Dates

2020 B Topper Hazop Report (302/1 (B) B-Topper)	November 2, 2020
2015 B Topper Unit Revalidation (302/1 (B) B-Topper)	July 13, 2015
2021 A Reformer Hazop Report (301/1 (A) A-Topper)	April 19, 2021
2016 A-Reformer Hazop Revalidation Project (315/10 A-Reformer)	May 12, 2014
2021 Vacuum PHA Report (309/13 Feed Prep)	January 18, 2021
2015 Vacuum Revalidation (309/13 Feed Prep)	September 14, 2015
2021 Central Amine Hazop Report (314/20G Central Amine)	April 19, 2021
2016 Central Amine Hazop Revalidation Report (314/20G Central Amine)	April 4, 2016
2020 Intermediate Tank Farm (North Pressure Area/ South Pressure Area (343/348))	July 7, 2020
2015 Intermediate Tank Farm Revalidation Report (North Pressure Area/ South Pressure Area (343/348))	May 18, 2015
2018 Topper Tail Gas Hazop Revalidation (304/ 1A TTG-JC36)	December 10, 2018
2013 Topper Tail Gas Revalidation Hazop Report (304/ 1A TTG-JC36)	July 15, 2013
C4 PHA	August 9, 2018
C4 PHA	April 1, 2013

AOC 10 – 40 C.F.R § 68.67(g) Process Hazard Analysis

“(g) The owner or operator shall retain process hazards analyses and updates or revalidations for each process covered by this section, as well as the documented resolution of recommendations described in paragraph (e) of this section for the life of the process.”

Two findings from the 2018 C4 revalidation PHA were not tracked in IMPACT database.

AOC 11 – 40 C.F.R § 68.73(d)(1) Mechanical Integrity

“(d) Inspection and testing. (3) Inspections and tests shall be performed on process equipment.”

I was not provided the following documentation: deferral equipment list, list of overdue inspections, records on gas detectors (H2S and ammonia), the deluge system, and a list of pipe clamps/wraps along with installation dates.

AOC 12 – 40 C.F.R § 68.73(d)(3) Mechanical Integrity

“(d) Inspection and testing. (3) 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.”

The following equipment inspection frequencies were not consistent with applicable manufacturers' recommendations and good engineering practices per the five-year API guidelines: C4 Recovery 319 3-319C23A LP. CAT GAS/WATER TE [CONDENSER], C4 Recovery 319 3-319E10 and C4 Recovery 319

3-319F8.

AOC 13 – 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.”

The 2020 compliance audit noted 3 PHA findings: PHA-01, MI-01, and RMP-G-01; however, under the compliance audit section they note: NO NEW FINDINGS. A finding should be present for 68.79(d) – failure to promptly determine and document an appropriate response to each of the findings of the compliance audit and document that deficiencies have been corrected because the audit notes that items from the 2017 audit are currently still open and have target dates for completion that extend several years. CITGO failed to promptly determine and document an appropriate response to each of the findings of the compliance audit and that any deficiencies have been corrected. There are 4 action items still open. Each have due dates that are 12/15/22, 12/15/22, 12/15/27, and 12/15/34. They are not opened beyond their due dates.

AOC 14 – 40 C.F.R § 68.85(b) Hot work permit

“(b) The permit shall document that the fire prevention and protection requirements in 29 CFR 1910.252(a) have been implemented prior to beginning the hot work operations; it shall indicate the date(s) authorized for hot work; and identify the object on which hot work is to be performed. The permit shall be kept on file until completion of the hot work operations.”

Permits #630515, #630512, and #407299 failed to identify the object on which hot work is to be performed.

Section IV – FOLLOW UP

The following information was received by EPA on August 22, 2022, after exiting the facility on August 12, 2022: Confidential Business Information related to this inspection.

Section V – LIST OF APPENDICES

There are no photos, videos, or other appendices in this report.