

Your response must be at least 400 words in length. You are required to use at least two references, including your textbook for your response. All sources used, including the textbook, must be referenced. Paraphrased and/or quoted materials must have accompanying citations in APA format

Information about accessing the Blackboard Grading Rubric for this assignment is provided below.

Unit VII Case Study

Read the incident scenario, and write a response that is at least three pages in length. Your response must include answers to the questions being asked. All sources used, including the textbook, must be referenced. Paraphrased and/or quoted materials must have accompanying in-text and reference citations in APA format.

Scenario:

You are the Refinery Emergency Response Coordinator for an incident at the SJV Refinery which has been in operation since 1966. The refinery processes 120,000 bbls of crude oil per day, which has a sulfur content of 2.5 percent. The refinery converts crude oil to naptha, light oil, and heavy oils using the Atmospheric/Vacuum Distillation Unit with key equipment such as the following:

- naptha, kerosene, gasoline, and diesel hydrotreaters;
- isomerization unit;
- naptha reformer;
- fluid catalytic cracker;
- coker;
- hydrocracker;
- polymerization unit (petrochemical section of the refinery polymerizing olefin gases to produce polyethylene);
- sulfur recovery Claus plant (catalytic reactors); and
- distillate/gasoline blending tanks.

The refinery was initiating work on a major plant turnaround at the time of the incident to complete required maintenance repairs, mechanical integrity inspections, and modifications to existing equipment. Twenty contractor companies (approximately 150 employees) have been contracted to perform this work under the direction of refinery staff. All of the contractor workers completed the refinery orientation training.

Work for the contractor crews is assigned/scheduled each morning. On the day of the incident, the day-shift (6 am to 6 pm) crew had been tasked with isolating the acid gas feed stream for the Claus unit. Due to other work priorities, the crew did not isolate the line as planned. A shift turnover for the night contractor crew did not happen due to mandatory safety training that delayed their arrival at the worksite. Upon their arrival at the work site, the night crew held a job safety analysis (JSA) review of the scheduled task (line breaking of the acid gas feed line to replace a segment) to be performed and the hazards present. No pressure gauges or monitoring was present to indicate that the acid gas feed line was operational. The crew initiated the line breaking activity (open the line to the atmosphere) at approximately 7:45 pm under self-contained breathing apparatus (SCBA), which almost immediately resulted in the uncontrolled release of acid gas. A nearby ignition source from a welding operation ignited the flammable gas. The following actions were initially taken:

- The evacuation alarm was sounded and the refinery emergency response team (ERT) was activated.
- The plant manager and the local fire department were notified of the incident.
- The incident command was established at the refinery office near the main refinery access gate to the south (this is the furthest distance within the refinery boundary from the incident location).
- The refinery ERT incident commander implemented actions required under the approved refinery emergency response plan.
- The ERT was not able to immediately isolate the acid gas feed pipeline.
- The fire department arrived on location and assumed the incident command of the event.

Additional Relevant Information:

- The refinery encompasses an area measuring 2000 feet by 1400 feet. The Claus unit is located in the most northern part of the refinery, approximately 1350 feet from the main refinery access gate to the south. The polymerization unit is operating directly adjacent to the Claus unit.
- The nearest residential community is located approximately 1000 feet to the northeast of the refinery.
- A plastic recycling plant is located along the south fence boundary of the refinery.

- A major interstate highway runs directly parallel to the plant, approximately 1/4 of a mile directly north of the refinery.
- The ambient temperature on the day of the incident was 85° F and the wind was blowing at 7 mph from the southwest to the northeast.
- Work crews were scheduled to work 12-hour shifts, 24-hours a day, to complete the refinery turnaround.
- Due to the age of the refinery, SJV has implemented a robust mechanical integrity program.
- The refinery has a trained ERT that can respond to incidents.
- Fixed water monitors are present throughout the refinery to extinguish refinery equipment fires. The refinery ERT does not fight fires past the incipient stage.
- The refinery has received notices of violation (NOVs) from the local air district in the past several years due to gas and liquid leaks from piping components, such as valves, compressor/pump seals, and for excess sodium dioxide (SO₂) emissions related with their sulfur plant.
- Due to historical discharges of organic compounds, groundwater monitoring wells are present down gradient of the facility. Groundwater underlying the plant has historically been encountered at 30 feet below ground surface.
- Hydrogen sulfide is present in the acid gas feed to the Claus plant. The H₂S concentration of the acid gas feed is approximately 70 percent by volume. H₂S and sulfur dioxide (SO₂) have the following physical properties:

Physical Property	H ₂ S	SO ₂
Specific Gravity at 68°F (20°C)	1.54	1.4
Vapor Density (Air=1)	1.18	2.22
Flashpoint	-116°F (-82.4°C)	Not Applicable
Autoignition Point	500°F (260°C)	Not Applicable
Lower Explosive Limit	4.3%	Not Applicable
Upper Explosive Limit	46%	Not Applicable
IDLH	100 ppm	100 ppm

Questions:

1. Discuss the hazards posed by the interaction of the hazardous materials present at the refinery and adjacent facilities, including the resulting by-products of the incident fire and acid gas release.
2. As the lead refinery representative on the unified incident command (UIC), what actions should be taken by the UIC to respond to this incident (please consider all receptors).
3. If the polymerization unit is engulfed in the fire, how will this affect your response?
4. All emergency responders participated in the post-incident critique. What corrective actions should be implemented by the refinery to prevent the reoccurrence of this incident?

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APA Guidelines

The application of the APA writing style shall be practical, functional, and appropriate to each academic level, with the primary purpose being the documentation (citation) of sources. CSU requires that students use APA style for certain papers and projects. Students should always carefully read and follow assignment directions and review the associated grading rubric when available. Students can find CSU's Citation Guide by clicking [here](#). This document includes examples and sample papers and provides information on how to contact the CSU Success Center.

Grading Rubrics

This course utilizes analytic grading rubrics as tools for your professor in assigning grades for all learning activities. Each rubric serves as a guide that communicates the expectations of the learning activity and describes the criteria for each level of achievement. In addition, a rubric is a reference tool that lists evaluation criteria and can help you organize your efforts to meet the requirements of that learning activity. It is imperative for you to familiarize yourself with these rubrics because these are the primary tools your professor uses for assessing learning activities.

Rubric categories include: (1) Discussion Board, (2) Assessment (Written Response), and (3) Assignment. However, it is possible that not all of the listed rubric types will be used in a single course (e.g., some courses may not have Assessments).