

MONSANTO CHEMICAL COMPANY

ter-Office

From LOCATION

Texas City, Texas

cc: H. M. Keating

DATE

February 15, 1960

P.T. 194 Saf. Bureau

SUBJECT

Investigation of Fire at Department 6-16 Flare

REFERENCE

3/7/60

WEL
RVP

TO

W. R. Nisbet

W. E. Repschleger

SUMMARY

At 0828 on February 14, 1960, burning liquid entrained in the gas stream to the department 6-16 flare (16Z1) was sprayed over the area directly west by the east wind of the flare. The burning material hit the Power #1 roof and a small amount fell among the oil field boilers.

The fire department arrived at 0833, put out the burning organics with powder, and the all-clear was sounded at 0854.

Damage to the roof of Power #1, and the surrounding facilities was negligible.

COMMENTS

Due to extremely high production demand, for the past week, department 6-16 has had to flare part of its off-gas. Liquid entrained in this stream is removed from the flare sump by pumping to the DM header. During normal operation very little liquid will get into flare base. The department 6-16 flare base does not have a sight glass on it, once each shift the operator checks a bleed valve at the base of the sump and if he finds liquid, the sump is pumped out. It was discovered that this valve was plugged and the previous shifts believed the sump was empty. For several shifts prior to the spill, no liquid was obtained when the bleed valve was opened and the operators assumed the sump was empty.

Actually, the level was high, probably up to the gas inlet line. This condition eliminated any disengagement section and during the upset (Sunday) liquid and gas were carried up the stack.

At these high rates the exchangers (16E5 and E6, 6E5 and 6E6) cooling the off-gas are close to flooding conditions. An upset or flooding condition in the exchanger overloads the centrifug separator at the exchanger (16E6) outlet and causes liquid entrainment to the flare or Power #2. During a previous high production period saddles were carried over from the scrubber (16K1) into the chillers (16E6 and 6E6) which have partially plugged chiller drain lines and contribute to flooding.

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FURTHER DETAILS

Department 6-16 off-gas is cooled by a salt water exchanger (6E5 and 16E5), chilled in a refrigerated water exchanger (16E6 and 6E6) to remove all condensibles possible and the gas flows to Power #2 where it is used as fuel for a boiler. In order to meet the high production demands, EB feed rate has been about 33% over design but off-gas flow during the last week has been nearly 100% above rated capacity. With the high flow the pressure drop in the line from department 6-16 to Power #2 created high pressure at the department 6-16 off-gas compressors' discharge (16C1's and 6C1's). Therefore, it was necessary to set the pressure regulated relief valve on department 16 which discharges this cold gas to the flare so that back pressure on compressors would be held at the top operating limit.

ACTION TO BE TAKEN

1. ~~The reaction temperature was reduced in department 6-16 so that off-gas flow could be handled without flaring gas.~~ ^{OPERATING RATE}
1. ~~The bleed valve was cleaned and arranged so that an operator can clean it easily. Checking frequency was increased moved up to 10 times a day versus once each shift. Actually, the flare sump had not been pumped out for 37 hours so that if the bleed valve had not been plugged, the sump level would have been kept clear on routine checking. During normal operations routine level checking and starting of the pump as an extra precaution will prevent recurrence of this nature.~~ ^{problem.}
2. ~~Installation of a high level alarm in pump sump will be considered, and installed if justifiable.~~ ^{of sight glass in the flare sump}
3. ~~The question of off-gas system capacity is being pursued by engineering and production as part of expansion project.~~ ^{design will be modified as necessary to meet the conditions of the expanded operation.}
4. ~~Failure of several shifts to question the lack of liquid build-up in the base of the flare.~~ ^{(even though the off-gas system was giving trouble) was reviewed with all of the department operating personnel as poor performance.} ~~R. V. Parker~~

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Recommendations

1. Where design limitations in emergency systems have been demonstrated, projects to correct these limitations should be expedited.
2. The need of all personnel to question unexpected observations (absence of liquid level from the flare base drain valve in this case) should be reviewed in safety meetings or in training programs.

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(A.M.Z.)