

INTRODUCTION

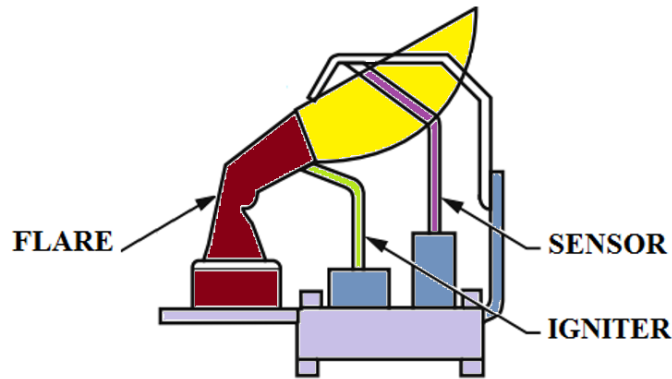
- The work focusses on the oil industry, and particularly on the oil fields where natural gases are occasionally produced during the oil extraction process. These gases are transported to special torches called flare stacks to be burned.
- The classical igniters are installed close to the flare stacks permanently and generate the electrical spark to ignite the flares. The igniters are protected from the high operating temperature by thermal insulators.
- The currently used igniters have a short lifetime because of high operating temperature, hence, this reduces the system reliability. Also, the need of special thermal insulators increases the price of these systems.
- Flare stacks either installed on the ground or on the towers.



- The main aim of this work is to introduce a new design for the ignition systems. The new design uses movable igniters. The new igniters are fixed away from the flares, to reduce the operating temperature.

THE ROBOTIC IGNITION SYSTEM

- For ground flares, a robotic car has been equipped with different sensors to achieve the ignition action.
- An embedded system is integrated with the car, it approaches the flare by detecting the gas, then it lights up the gas before heading to a safe point.



The structure of the classical igniter

THE AUTOMATED IGNITION SYSTEM

- For flares on the towers, an automated car has been employed to move on a vertical rail toward the flare.
- An embedded system is integrated with the automated car, it moves towards the flare to ignite it and then returns to the initial point.



CONCLUSIONS

- This research presents a new method to ignite the flare stacks on ground and on towers, the main advantage of the new method is that the igniters in the two suggested systems are movable.
- So the exposure time of the igniter to the heat will be within few seconds.
- This new feature increases the reliability of the igniter and reduces the complexity and the cost of the system.