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Minimizing the Occurrence of Black Powder in Gas Lines and its Removal

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Objective / Scope: Black powder contamination in gas stream has been a matter of great nuisance. Its occurrence causes operational, maintenance, HSE, reliability & integrity issues and various undesirable consequences like product contamination, production loss, economic loss and sustainability concerns (e.g. due to flaring), for both the operators and the downstream customers. The objective of this paper is to demonstrate the success of immediate / short-term measures taken to minimize its occurrence and subsequently its removal.

Methods, Procedures, Process: Several technical reports and research works are found in the literature pertaining to black powder, still, need of more awareness has been felt by researchers / industry. In order to contribute for such cause, the present paper attempts to review the problem of occurrence of black powder and various strategies that are adopted to handle the associated issues, in general and shares experience of minimizing the occurrence of black powder by revisiting the chemical injection dosages, frequent pigging operations and other methods at one of the oilfield areas in Kuwait, in particular classified as short-term / immediate measures.

Results, Observations, Conclusions: Pipelines and connected systems are designed considering solid / liquid contaminations expected in the gas stream; but such provisions can become insufficient if occurrence of black powder starts, later, during operation. In view of involved complexity, problematic feature & uncertainties, operating companies may implement a black powder management system incorporating prevention, mitigation and removal strategies. Accordingly, when occurrence of black powder, along with liquid carry-over, in sour gas streams at one of the oilfield areas in Kuwait was observed, various short-term strategies in hand were reviewed such as adjusting chemical injection dosages, frequent pigging operations. This results in remarkable reduction in the occurrence of black powder and accelerating its removal from gas lines. On the basis of the results it is observed / concluded that the immediate short-term methods are effective in minimizing the occurrence of black powder in gas lines and its removal.

Novel / Additive Information: The paper is expected to create awareness and enrich knowledge base regarding the occurrence of black powder in the middle-east region and its immediate / short-term handling solutions. This shall facilitate the Oil & Gas industry to address such problem of gas contamination and, in turn, handling its associated problems, like gas flaring, by attaining enhanced solutions based on such information.