

Strategies for Sustainable Petroleum Processing

MP Sukumaran Nair

Center for Green Technology & Environment
India

Abstract

Petroleum refining and associated downstream hydrocarbon processing operations are challenged on the one hand by the tightening product specifications and shifting crude quality on the other forcing an increased proportion of heavy and sour crudes. Regulatory specifications for products as well as process effluents are getting stringent over the years necessitating utmost optimization at every stage in refining operations while still retaining the industry commitment to economically provide hydrocarbon based fuel and feedstock and meet the increasing needs of the growing global population. All around awareness of environmental degradation caused by industrial activities in the hydrocarbon processing sector, on account of greenhouse gas emissions, stratospheric ozone depletion, acid rain and acidification, eutrophication, soil contamination, technological hazards, chemical mists and fog, all with potential damage to human beings, is indeed a topic of much discussions at both national as well as international forums. Environmental considerations, therefore assume significant importance in hydrocarbon processing operations which generate large quantum of effluents and emissions capable of degrading environment. Besides meeting physical targets of production adhering to quality and safety stipulations, industry operators are also responsible for effective tackling of environmental issues consequent to the production process and avoid damages to the community. An effective environmental management perspective addresses the numerous issues relating to pollution control, ensure safety and thus maintain sustainability in the industry. Clean development initiatives in hydrocarbon industries is a major development in this direction. The growth of hydrocarbon processing hitherto has been guided mostly by the necessity of increasing production at lower costs which led to serious environmental degradation of water resources, soil and air around the processing plants. Worldwide the focus of pollution control in the industry has shifted from end of pipe treatment to source reduction, avoiding pollution, clean technology and sustainable development. Hence, it has become imperative that environmental considerations shall play a substantive role in the future development of the industry especially at a time when more and more such industrial activities are being undertaken in the developing countries. This study focuses this issue with the objective of identifying key issues in environmental protection in the different industrial processes, assessing as to what extent the national and international norms or guidelines regarding pollution control and environmental management are implemented in the industries, understanding the problems encountered in environmental management and exploring the reasons for the non-compliance. Suggestions were also made on the basis of the above studies to develop guidelines of an environmental policy and adopt cleaner technologies that will foster development with least degradation to the environment.