

AAF Contributes to one of the Biggest Refinery Projects

CASE STUDY: REFINERY INDUSTRY

Customer Profile

- Location: **Middle East**
- High-value Government project
- 900 hectares Refinery and Petroleum project

Refineries require an uncontaminated and controlled environment. Particulate & gaseous contaminants are the major problems for the refinery industry. This may result in catastrophic failure of equipment. Contaminants may enter the control rooms in a variety of ways including outdoor ventilation systems, adjacent interior areas and individuals entering and exiting the room. Designing an optimal air filtration solution and improving the environment is crucial. One of the key requirements of this project is to have all the equipment couple with Seismic support which involves detailed structural engineering for the AAF equipment.

Filtration Situation

The new project to build a refinery and petrochemical plant was one of the major downstream projects planned in the region. The plant was expected to process approximately 200,000 barrels of crude oil per day which includes the production of diesel, jet fuel, naphtha and LPG products.

This government-approved project had pre-specified requirements on air filtration equipment. The scope of the project required the inertial filter and chemical filter equipment with a seismic support system. High capacity inertial filters with a seismic support system and gas-phase filtration solution for control rooms and corrosion susceptible areas were specified.

The resulting ratios of various gases will also be different because of the various states of decomposition. Therefore, the gases identified may be present at various areas of the application site but may not be present in the same concentrations or contaminant ratios. Apart from Odour issues being a common nuisance to tackle, the exposure to such gases even at low to medium levels can irritate eyes and respiratory tract. It can also create nervousness, dizziness, nausea, headache, and drowsiness.

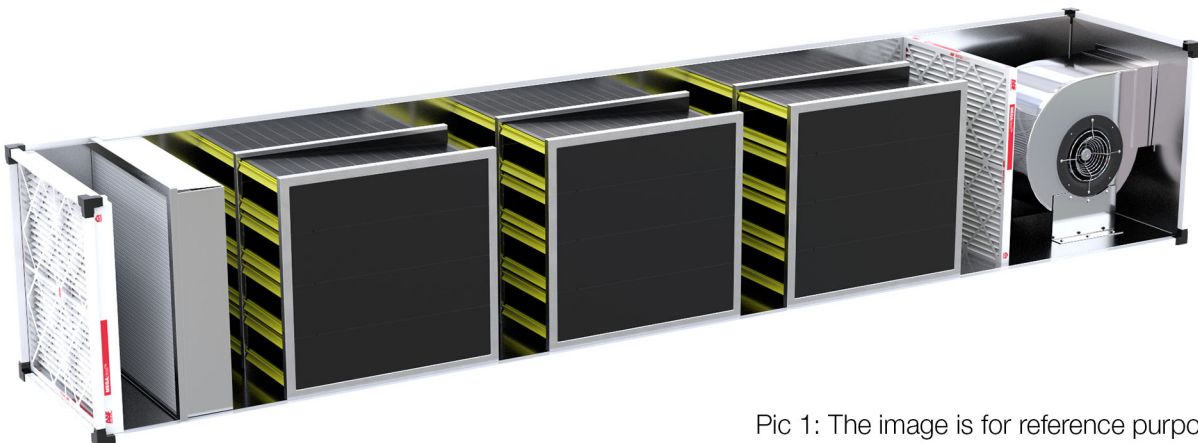
This was the major criteria of the consultant to decide on the filtration solution. The consultant would agree or disagree depending on the above parameters.

AAF International Solution

The scope of the project required the inertial filter and chemical filter equipment with a seismic support system. In response to the specifications provided and with the US case reference solution, the AAF design and engineering team came up with a proposal with a completely modular, high-efficiency inertial filter with a seismic support system.

The Dust-Trap louver is a heavy-duty self-cleaning filter, equipped with an inertial separator for filtration of dry, granular contaminants. It protects the air-conditioning plants by filtering airborne particles with an efficiency of coarse dust by inertial separation and is self-cleaning. 100% construction made in GI making it a robust design without media inside and self-cleaning mechanism. This increases the life of the pre and bag filters saving huge maintenance costs for the end-user.

Based on the project requirements, this was an apt recommendation for air conditioning and ventilating systems in heavy industrial conditions.



Pic 1: The image is for reference purpose only

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The goal of the project was to maintain the G1 condition in the control rooms of the plant. AAF engineers designed the Chemical Filter Unit (CFU) with 3 stages of gas-phase filtration to remove sulfur-bearing gases such as sulfur dioxide (SO₂) and hydrogen sulfide (H₂S). CFUs come with 1 stage of the prefilter, fine filter and 3 stages of gas-phase filters.

The media selection focusing on the environmental report sent by the end-user for refinery comprises hydrocracking, hydro-treating and delayed coking units, along with sulphur recovery, hydrogen generation and merox treating units. Based on this information, the media selection was done to protect the control rooms and various other buildings around the refinery from corrosive and toxic gas contaminants.



Result

A detailed explanation of engineering and design of the seismic support of the equipment provided to the customer assured the project in AAF's favour. The synergy between our global teams played an instrumental role in the successful approval of the design for the DLH equipment for this project. AAF exhibited a cost optimization on capital and operational cost by showing the life-time analysis of the designed media for the gas phase filters, this was well appreciated by the technical department of the end-user and main contractor.

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