



# OFFSHORE AIR FILTRATION AND ACOUSTIC SYSTEMS.





The aggressive environmental conditions that exist around offshore platforms, have proved to be very demanding on gas turbines and their associated combustion/ventilation air intake systems.

The naturally occurring marine aerosol, which releases airborne salt crystals in both wet and dry phases, together with the extremes of temperature, humidity and pressure, pose major problems for this type of equipment.

Platform drilling operations also generate a major source of airborne particulate matter with the periodic release of massive concentrations of mud burn dust cloud, and cement dusts. In addition the flare tip, lube oil vents and engine exhausts are responsible for the release of viscous hydrocarbons.

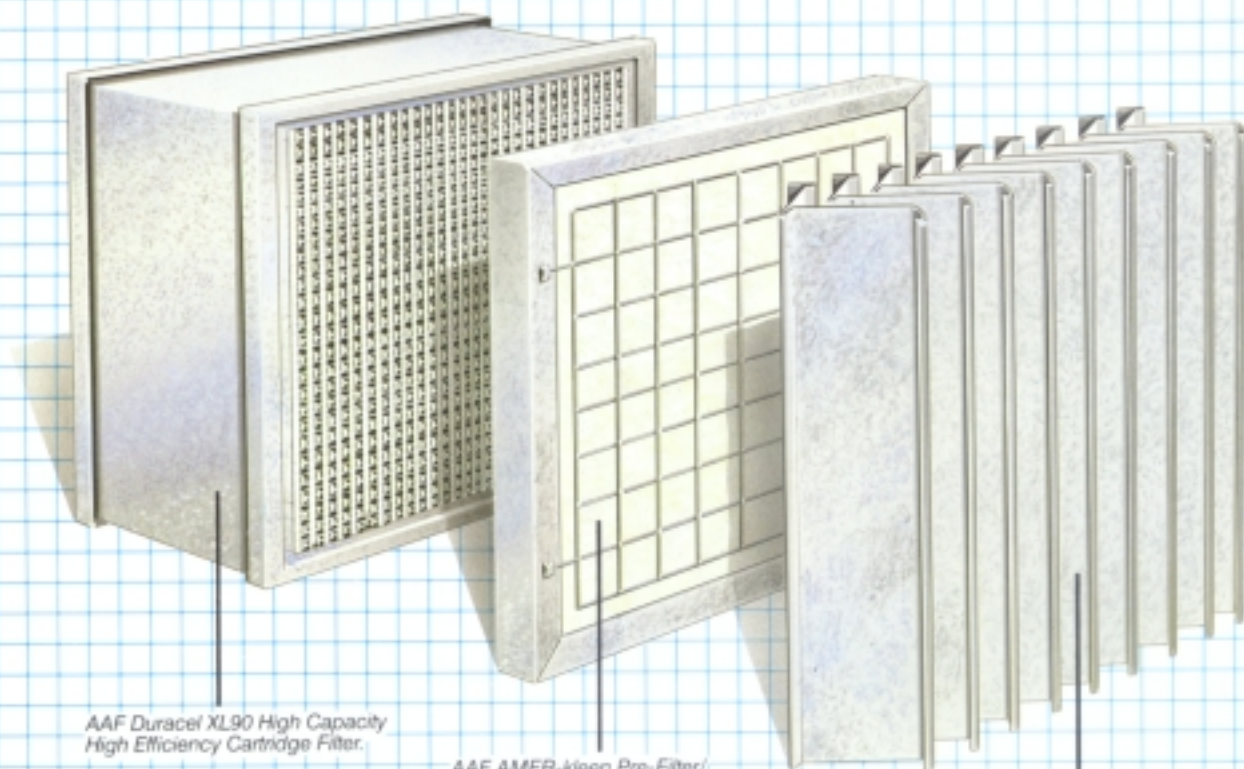
These all impinge upon the intake system surfaces and act as a vehicle to attract and hold dry particulate.

Platform based air filtration systems are therefore required to effectively remove all these ingested particulates to a level that prevents fouling, erosion and corrosion of the turbine and its inlet system.

Two gas turbines with air intake systems on the Elf Frigg TCP 2. ▶



# HIGH CAPACITY EFFICIENCY AIR FILTRATION



AAF Duracel XL90 High Capacity High Efficiency Cartridge Filter.

AAF AMER-kleen Pre-Filter/Coalescer Disposable Pad Filter.

AAF 2 1/2 Pass Vertical Vane Weather Louvre.





Seven Rolls Royce RB211 intake systems and seventeen ventilation intakes on Marathon Brae B.

Mud burn on the Mobil Statfjord B Platform.

Flare tip releasing viscous hydrocarbons on the Oxy Claymore.



# TY/HIGH ION SYSTEMS



Two of the four gas turbine intake systems on the Mobil Beryl A.

AAF Duracel/AMER-kleen combination.



Considering that approximately 40% of all airborne particulates exist in the size range of less than  $2\mu\text{m}$ , and a further 40% occur between 2 and  $5\mu\text{m}$ ; and that the relative humidity is constantly fluctuating between 30 and 100%, careful consideration must be given to the selection of an intake air filtration system.

AAF, one of the world's leading authorities in offshore air filtration systems with experience gained from over 30 North Sea installations, has shown that the most effective way to achieve the operating objectives with an acceptable resistance, is with the AAF two stage high capacity, high efficiency air filtration system. This comprises a high efficiency interception/diffusion type filter (the AAF Duracel XL) preceded by a pre-filter/coalescer pad (the AAF AMER-kleen) and weather hood or louver.

## AAF Duracel XL Cartridge Filter

The AAF Duracel XL90 filter is a heavy duty, high capacity cartridge filter of extremely robust construction. It is specifically designed for use with

rotating machinery and will withstand a differential pressure of 3.8Kpa before degradation occurs, and 6.35Kpa before structural damage is expected.

## AAF AMER-kleen Disposable Filter.

The pre-filter/coalescer pad is the well proven AAF AMER-kleen. This low cost, disposable filter is used in front of the AAF Duracel, to act as a coalescer during periods of fog and high humidity. It is also extremely effective in the removal of the hydrocarbons and industrial pollutants generated by the platform operations.

The AAF two stage filter system is normally protected from driving rain and fine droplets, with a simple hood or louver such as the AAF 2½ Pass Vertical Vane Weather Louvre.

This combination of filters and weather louver has been shown, by independent tests in both laboratory and offshore, to provide maximum machine availability with a minimum of downtime.





# ACOUSTIC PACKAGES

*Typical gas turbine intake silencers under construction.*

AAF are one of the market leaders in the design, manufacture and supply of acoustic systems for heavy and light rotating machinery. The company's expertise in this specialised field is acknowledged throughout the petro-chemical industry.

## **Intake Silencing**

Manufacturing standards for air inlet silencers and plenums are well established, with designs capable of handling high intensity sound levels and extreme mechanical stresses under possible surge conditions. The sound power level radiated from the open intake of a gas turbine can often exceed 150db and in many instances, attenuation of 70db is necessary to meet site criteria.

## **Turbine Enclosures.**

The acoustic enclosure for the prime mover provides weather and fire protection in addition to the attenuation of 60db or more in some octave bands.



## **Exhaust Silencing**

Exhaust silencers and ductwork systems require individual mechanical design in order to withstand thermal shock, in addition to providing high attenuation at low frequencies and high volumetric flow rates.

This AAF produced package of air filtration and acoustic equipment is available in the traditional painted mild steel or natural galvanised finish.

However, the offshore industry is now showing a preference for stainless steel, with its advantages of reduced weight and increased corrosion resistance.

Acoustic treatment of gas turbines and other prime movers has been undertaken on installations throughout the world, both on land and offshore.

AAF also provide a full technical and manufacturing facility for refurbished acoustic systems.



# AAF Installations

-  AAF installations on offshore platforms
-  AAF installations at Compressor Stations
-  Other North Sea installations



AAF have also supplied equipment to a number of semi-submersible drilling rigs and supply vessels.





# AAF<sup>®</sup> SUPPORT SERVICES

AAF provide a wide range of supporting services for both the manufacturer and operator of gas turbines. These complement the range of filter and acoustic packages and include the design and supply of Anti-Ice Systems, Evaporative Coolers and By-Pass Systems.

The Anti-Ice systems offered by AAF take two forms. One utilises bleed air from the axial compressor

and injects it directly into the turbine air inlet, while the other arrangement is the AAF Intec system. This sophisticated, flexible design employs a plate-type heat exchanger for maximum heat transfer of the hot turbine exhaust gases.

By-Pass systems utilise either conventional gravity operated blow-in-doors with pneumatic/electric latch mechanisms or power driven

arrangements. These overcome the effects of wind shunting and air leakage.

Additional services include every aspect of survey and design associated with turnkey air handling systems. These involve on-site particulate analysis and electrical, mechanical and structural trouble shooting by teams experienced in the offshore industry.

AAF has a policy of continuous product research and improvement and reserves the right to change design specifications without notice.



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