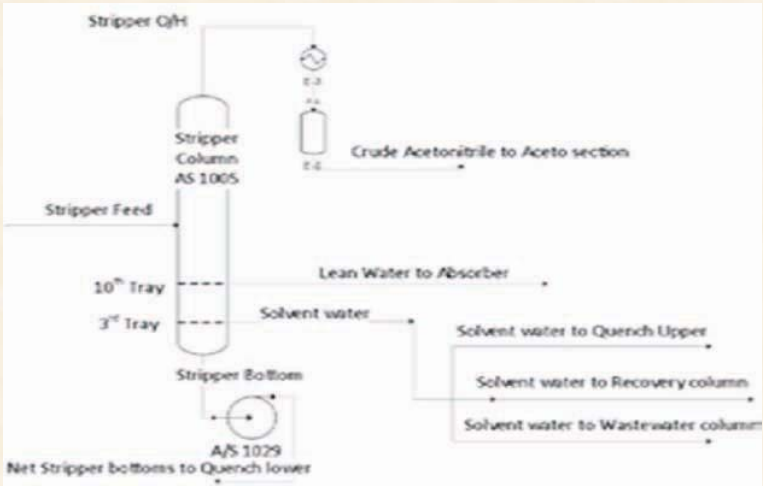
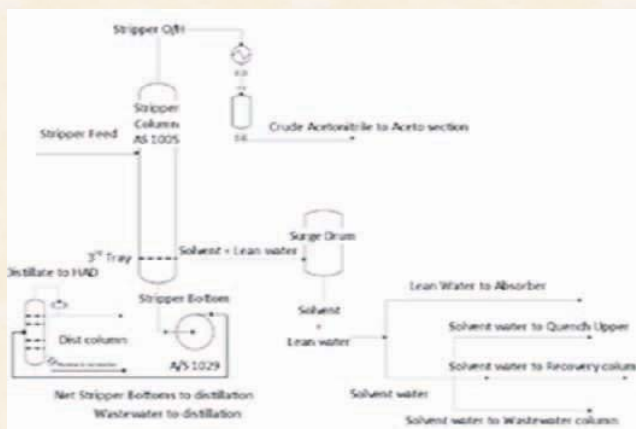


<b>Intervening Technology/Technique</b>	<b>Tackling The Pollutant at Source, Reliance Industries Ltd -Vadodara</b>
<b>About the industry</b>	M/s. Reliance Vadodara Manufacturing Division (RIL-VMD) located in Gujarat. It is the pioneering Petrochemical unit in India. RIL-VMD is Asia's only producer of ACN (Acrylonitrile) and India's only producer PBR (Poly butadiene rubber).
<b>Implemented Techniques/Technology</b>	<p><b>Before</b></p> <ul style="list-style-type: none"> <li>• Reduction in HCN emission from process stack (AOG vent) at ACN plant. Acrylonitrile production involves the chemical catalytic reaction of propylene and ammonia vapors with oxygen. Reaction occurs in a Fluidized Catalytic Bed Reactor and was Exothermic in nature. Acetonitrile and Hydrogen Cyanide are major by-products of this process.</li> <li>• Hydrogen Cyanide (HCN) was removed from the system as additional product in gaseous phase. However HCN has a tendency to travel with water that was also generated by process chemistry. The water which was separated out after Acetonitrile Stripping operation, was recycled as solvent in the Acrylonitrile.</li> <li>• Absorber column as “Lean water”. The basic purpose of the absorber column was to absorb gaseous produce Acrylonitrile in water and facilitate removal of inert such as Nitrogen as Absorber off Gas (AOG). This column operates at lower temperature and pressure as a result of which, trace amount of this HCN was separated out of water and appears in the Off Gas Vent amounting to a concentration of about 30 mg/Nm<sup>3</sup> of the total gas flow. In this gas it was observed by GPCB that there was high concentration of Ammonia being released for which the industry was issued notice of direction.</li> </ul> 



**After**

- In order to bring down the HCN concentration in AOG, a unique scheme is implemented in-house which is aided by use of Process Engineering Tools such as ASPEN based Simulation. As shown in the schematic below, earlier Lean water is separated out from the stripper column from the 10th tray from the bottom, because of which HCN concentration in this stream is substantial.
- With the intention to reduce HCN concentration in AOG, stripper column withdrawal of solvent and lean water is modified. Now lean and solvent water are both withdrawn from the 1<sup>st</sup> tray of the stripper column, reducing HCN concentration in lean water by 50%.



**Benefits**

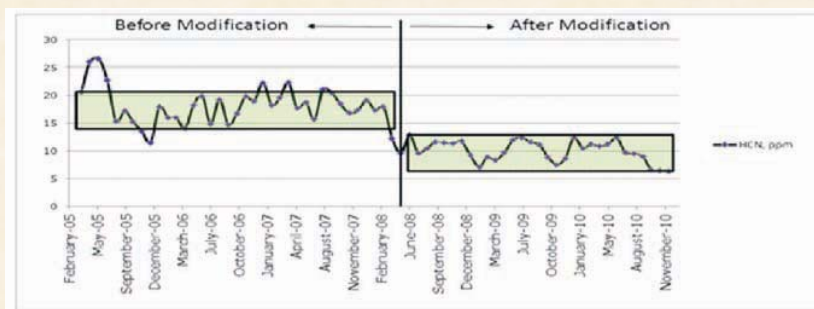
**Economical**

- ACN emissions to atmosphere also reduced by 51.840 MT/annum that have increased revenue by Rs.26.43 lacs. Total revenue increased by Rs.27 lacs.

**Environmental**

- This project caused 50% reduction of cyanide emissions from Absorber off Gas vent to atmosphere amounting to about 4 MT/year.

**Graphical representation of HCN concentration before and after modification**



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