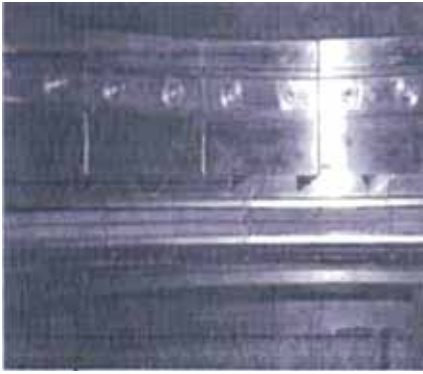
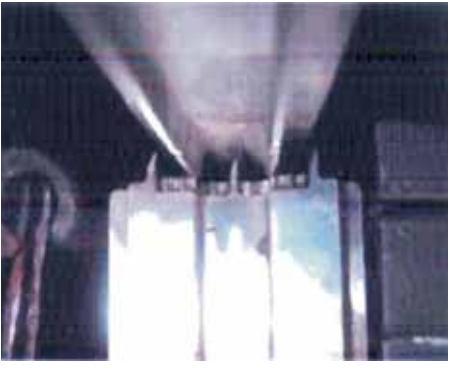


1	<b>ID: 80</b>	<b>Title of measure</b>	<b>Sector: Petroleum Pipeline</b>
2	<b>Survey Year: 2007</b>	<b>Antisurge valves provided in the pipeline</b>	<b>Technology: Control System</b>
3	Name of the Company : <b>GAIL(INDIA) Limited, Vijaipur, Guna, Madhya Pradesh, INDIA</b>		
4	Agency that executed the project : In-house		
5	Year of Implementation : 2006-07		
6	<p><b>Unit Profile:</b></p> <p>GAIL (India) Limited (Erstwhile Gas Authority of India Limited), India's principal gas transmission and marketing company, was set up by the Government of India in August 1984. Today GAIL has expanded into gas processing, petrochemicals, liquefied petroleum gas transmission and telecommunications. The company has also extended its presence in power, liquefied natural gas re-gasification, city gas distribution and exploration and production through equity and joint ventures participations. GAIL (India) has the largest high pressure pipe line in India.</p>		
7	<p><b>Description of Energy Conservation Measure:-</b></p> <p>Antisurge valves are provided in all gas turbine compressors (GTCs) as a safety feature. These valves are located between suction &amp; discharge headers of each compressor. In normal operation, these valves will be in closed condition and open in case of abnormal operating conditions. In case of antisurge, valve used to be in open condition and part of the compressed gas was fed back to suction line resulting wastage of energy. Controllers have been upgraded for keeping these valves in auto mode, resulting in optimized operation. Fuel consumption &amp; Surge controller deviation trend during and after reduction of Earlier anti-surge valve of GTC-A was kept 15% open while that of GTC-B was fully closed. Now at present, opening of anti-surge valve of GTC-A in Dahej-Vijaipur pipeline (DVPL) is kept zero.</p> <p>Total fuel consumption in DVPL compressor is reduced by 413 Standard Cubic meter per hour (SCM/HR).</p>		
8	<p><b>Picture/Sketch /Drawing Before Modification</b></p>	<p><b>Picture/Sketch/Drawing After Modification</b></p>	
9	Total investment :	Nil	
10	First year energy cost savings :	976,500 US\$	
11	First year additional savings beyond energy (i.e. water, raw materials etc.):	Nil	
12	Annual gas consumption before, thousands of m <sup>3</sup>	26,280	
13	Annual gas consumption after, thousands of m <sup>3</sup>	22,560	
14	First year gas savings, thousands of m <sup>3</sup>	3,720	
15	First year tons of CO <sub>2</sub> mitigated	10,363	
16	Assumed sustainability, years	10	
17	<b>Expected tons of CO<sub>2</sub> mitigated throughout life cycle</b>	<b>103,630</b>	

1	<b>ID: 81</b>	<b>Title of measure</b>	<b>Sector: Petroleum Pipeline</b>
2	<b>Survey Year: 2007</b>	<b>Fuel consumption reduction with implementation of Honeycomb Shrouds</b>	<b>Technology: Honeycomb Shrouds</b>
3	Name of the Company : <b>GAIL (INDIA) Limited, Vijaipur, Guna, Madhya Pradesh, INDIA</b>		
4	Agency that executed the project : In-house		
5	Year of Implementation : 2006-07		
6	<p><b>Unit Profile:</b></p> <p>GAIL (India) Ltd (Erstwhile Gas Authority of India Ltd), India's principal gas transmission and marketing company, was set up by the Government of India in August 1984. Today GAIL has expanded into gas processing, petrochemicals, liquefied petroleum gas transmission and telecommunications. The company has also extended its presence in power, liquefied natural gas re-gasification, city gas distribution and exploration &amp; production through equity and joint ventures participations. GAIL (India) has the largest high pressure pipe line in India.</p>		
7	<p><b>Description of Energy Conservation Measure:-</b></p> <p>The unit has 2 nos. of Gas Turbines (G.T) which are being used as driving source for Lean Gas Compressor (LGC). These turbines are running continuously and are having no standby unit. Tripping of any turbine leads to plant shut down and hence production Losses.</p> <p>The original shrouds are Labyrinth type. Major inspection for these used to carry out at every 40000 to 48000 machine running hours. The in-house team recommended to replace these Labyrinth type, costing around US\$ 0.03 million, with Honeycomb shrouds costing US\$ 0.05 million. The recommended running of honeycomb shrouds is 96000 hrs. Honey comb shrouds are one of the critical hot gas path component meant to restrict the leak of hot gas between 2nd stage buckets (moving part) and 2nd stage shrouds (stationary part) by maintaining minimum clearances, which in turn causes more flow of gas to LGC and increases machine efficiency.</p>		
8	<p><b>Picture Before Modification</b></p> 	<p><b>Picture After Modification</b></p> 	
9	Total investment :		12,000US\$
10	First year energy cost savings :		24,700
11	First year additional savings beyond energy (i.e. water, raw materials etc.):		Nil
12	Annual gas consumption before,	thousands of m <sup>3</sup>	24,708
13	Annual gas consumption after,	thousands of m <sup>3</sup>	23,720
14	First year gas savings,	thousands of m <sup>3</sup>	988
15	First year tons of CO <sub>2</sub> mitigated		2,753
16	Assumed sustainability, years		10
17	<b>Expected tons of CO<sub>2</sub> mitigated throughout life cycle</b>		<b>27,530</b>