



# REPORT ON EVEREST VACUUM PUMPING SYSTEM INTALLED IN XYZ PHARMA LTD. FOR REPLACEMENT OF STEAM JET EJECTOR

**PROJECT REFERENCE NO:** EBS/DM/xxxxx/2011-12

**EVEREST OFFER REFERENCE NO.:** EBS/DM/xxxxx/2010 **DATED:** Year 2011

**PURCHASE ORDER NO.:** xxxxxxxxxxxx **DATED:** xxxxxxxxxxxxxxxxxxxx

**PROJECT START DATE:** June , 2011 .

Performance measured on perpetual Basis

**PROJECT MONITORING- END DATE:** 02-07-2011

**Submitted by:** Mr. Nishant Mathur

(Process Sales Engineer - Everest)



EVEREST BLOWER SYSTEMS 415, Modern Industrial Estate, Phase 1, Bahadurgarh, Haryana 124 507, India. Email: ebs@everestblowers.com  
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## **COMMISSIONING**

The Vacuum Pumping system manufactured by M/s Everest Blower Systems has been successfully installed at M/s XYZ Pharma Ltd.

The Job has been done to the entire satisfaction of XYZ Pharma Ltd.

### **DAY WISE COMMISSIONING REPORT**

#### **Day1 (21-06-2011)**

The Team Everest reached the site and the material was unpacked and shifted to the exact site of installation.

**Meeting held with Mr. X(AGM Plant) and Mr. Y (Sr. Manager Utilities) and a team of Engineers is assigned to us for the commissioning of the Vacuum Pumping System.**

Guidelines given to the engineers of M/s XYZ Pharma Ltd. regarding the construction of the pipelines and other electrical parameters required.

#### **Day2 (22-06-2011)**

Pipelines were found to be ready but some other changes were suggested and the work started again immediately in the presence of all officials from supplier as well as users side with the cooperation of Maintenance Team from XYZ.

#### **Day3 (23-06-2011)**

The Vacuum Pump was connected but was not started as to check the parameters of the Present Setup in Reactor which was having a Water Ring Pump of 20 HP connected with 2 Steam Jet Ejectors and a Post Everest Mechanical Vacuum Booster of 7.5 HP motor.

**The batch in reactor was completed in 15 Hrs 30 Mins.**

The Table from Production Department is as below:



<b>Study on XYZ's Existing Setup</b>						
<b>Reactor</b>	<b>Date</b>	<b>Time</b>	<b>Temperature</b>	<b>Vacuum</b>	<b>RPM</b>	<b>Remarks</b>
<b>Reactor</b>	<b>21-06-11</b>	<b>20:30</b>	<b>34.8</b>	<b>0</b>	<b>24</b>	<b>Distillation started</b>
	21-06-11	21:00	36.5	675	24	
	21-06-11	21:30	37.1	700	24	
	21-06-11	22:00	38.4	700	24	
	21-06-11	22:30	37.9	700	24	
	21-06-11	23:00	37.6	700	24	
	21-06-11	23:30	36.9	700	24	
	22-06-11	0:00	36.1	700	24	
	22-06-11	0:30	34.4	700	24	
	22-06-11	1:00	34.2	700	24	
	22-06-11	1:30	35.7	650	24	
	22-06-11	1:40	36.7	600	24	
	22-06-11	1:45	37.8	650	24	
	22-06-11	2:00	36.9	675	24	
	22-06-11	2:30	35.1	675	24	
	22-06-11	3:00	34.4	675	24	
	22-06-11	3:30	34	675	24	
	22-06-11	4:00	33.7	675	24	
	22-06-11	4:30	36.5	675	24	
	22-06-11	5:00	32.2	700	24	
	22-06-11	5:30	31.7	700	24	
	22-06-11	6:00	32	700	24	
	22-06-11	6:30	32.2	700	24	
	22-06-11	7:00	32.3	700	24	
	22-06-11	7:30	32.4	700	24	
	22-06-11	8:00	32.7	700	24	
	22-06-11	8:30	32.1	700	24	
	22-06-11	9:00	33.1	700	24	
	22-06-11	9:30	34	700	24	
<b>Reactor</b>	<b>22-06-11</b>	<b>12:00</b>	<b>-</b>	<b>700</b>	<b>24</b>	<b>Distillation Completed</b>



<b>Study on Everest's SUPERVAC 1200</b>						
Reactor	Date	Time	Temperature	Vacuum	RPM	Remarks
Reactor Loading 4 KL	24-06-11	16:00	32.6	650		Distillation started
	24-06-11	16:05	32.2	670		
	24-06-11	16:15	30	700		
	24-06-11	17:15	38.8	680		
	24-06-11	18:15	38.5	690		
	24-06-11	19:15	38.7	690		
	24-06-11	20:15	37.6	690		
	24-06-11	20:45				Receiver unloaded (0.5 KL)
	24-06-11	20:55	36.9			Vacuum Generated
	24-06-11	21:00	36.4	680		
	24-06-11	22:00	37.7	680		
	24-06-11	23:00	37.3	690		
	25-06-11	0:00	38.6	670		
	25-06-11	0:40	36.7			Receiver Unloaded(0.5 KL)
	25-06-11	0:55	37.2	600		1 KL Material Loaded
	25-06-11	1:00	37.7	650		
	25-06-11	1:10	37	670		
	25-06-11	2:10	39.4	680		
	25-06-11	3:10	38.2	670		
	25-06-11	4:10	38.6	670		
	25-06-11	5:10	40	680		
	25-06-11	6:00	38.3	670		
	25-06-11	7:00	39.2	670		
	25-06-11	7:15	39.5	NA		
	25-06-11	7:30	39.1	NA		0.8 KL unloaded; 0.8 KL Material Loaded
	25-06-11	7:40	39.9	0		
	25-06-11	7:50	39.8	650		
	25-06-11	8:50	42.1	670		
	25-06-11	9:50	44.8	670		
	25-06-11	12:35	41.7	690		
	25-06-11	13:35	42.2	690		
	25-06-11	14:35	40.1	690		
<b>Batch stopped for Leakage Checking for 1 Hour, Receiver Unloaded at the same time 1KL</b>						



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	25-06-11	15:25	36.1			Vacuum Applied
	25-06-11	15:35	34.2	720		
	25-06-11	16:15	30.9	715		
	25-06-11	17:15	34.4	710		
	25-06-11	18:15	31.5	710		
	25-06-11	19:15	32	710		
	25-06-11	20:15	29.9	710		
	25-06-11	21:15	20.2	720		
	25-06-11	22:00	11.7	720		
	25-06-11	23:00	6	720		
	26-06-11	0:00	5.3	720		
	26-06-11	0:15	5.6	<b>Distillation stopped due to scrapping purpose and sample given</b>		
	26-06-11	1:40				Vacuum Started
	26-06-11	2:00	38.1	690		
	26-06-11	3:00	35.8	720		
	26-06-11	4:00	29.7	720		
	26-06-11	5:00	26.8	720	Distillation Completed	
	26-06-11	5:00			Ethanol Charging	
	26-06-11	5:30	35.8			
<b>Total Volume distilled: 3365 Liters</b>						
<b>Reactor</b>			<b>0</b>			<b>Distillation Completed in 36:30 Hrs</b>

As evident from the reports attached prepared by XYZ Production deptt. Everest VPS is giving high vacuum of the order of 710-720 mm of Hg thus reducing distillation temperature to 20-25 deg. Celcius. Against the vacuum of 670 mm of Hg achieved by XYZ Steam Jet Ejector & Product distillation at a temperature of 38.2 deg. Celcius.

#### Day4 (24-06-2011)

The Everest Vacuum Pumping System was accordingly changed and connected to Reactor reactor having 5 KL capacity. Vacuum Drop was found to be there in the reactor Reactor for which the batch was stopped to check the pipelines for leakages.



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Leakages were found after checking the pipelines @ 0.8 Kg/cm<sup>2</sup> air pressure and been rectified. The leakage test has to be performed @ 2 kg/cm<sup>2</sup> pressure to get the exact leakage in the plant and setup.

Batch started again and the vacuum was seen as 710-720 mm of Hg in the Dial Gauge over the reactor for which the batch completion time was seen to be 36 Hrs. 30 mins as compared to 42 Hours as against the XYZ present Steam Jet Set Up.

STATUS OF BATCH INSTALLATION		
PARAMETERS/SYSTEMS	STEAM JET SYSTEM IN XYZ	EVEREST SUPERVAC 1200
Vacuum Range	660- 680 mm of Hg	700- 720 mm of Hg
Batch Completion Time	42 Hours	33.5 Hours
Distillation Volume	3000 Liters	3365 Liters

A reduction of 5 Hours 30 Mins was observed by the production people with the help of Everest vacuum Pumping System.

#### **Day5 (25-06-2011)**

The opinion was taken from the production department saying that the product obtained with the Everest system found to be good in nature and the distillation rate is also high improving the quality of their product.

System has been under running the whole day & quality of XYZ product found to be satisfactory.

#### **Day6(30-06-2011)**

Mr.Y (Manager Purchase) came to the Plant to check the system installed and also had discussion with Mr. Y (Maintenance Department), Mr. X (Electrical Department) & Mr. S & Mr. T (Production Department).

Mr. Y suggested some Points of improvements and pointed out and which were immediately rectified. After the same was done, Vacuum System Performance found to be even better.

#### **Day7 -10**

Vacuum Pumping System Performance continuously monitored for current/ power consumption & Yield calculation by the production department and was found to be steady and satisfactory by the plant/ process officials.



## **VIEWS & COMMENTS BY XYZ OFFICIALS**

### **PRODUCTION DEPARTMENT:**

**Mr. T:** “ The System is running good and is easy to handle with no use of steam as earlier due to which sometimes they had to stop the batch and then restart the process for attaining desired level of vacuum.”

**Mr. O:**” The System is showing satisfactory results by increasing the distillate volume as well as improving the quality of the product. We will look further for this kind of System soon. The running of the pump is very easy& helpful for the production people.”

### **ELECTRICAL DEPARTMENT:**

**Mr.Y:**” The control panel supplied by Everest is very good, compact and automated, the main part is the VFD’s installed which will be helpful in reducing the power to 40% as to the connected load, the operation and connections are easy and user friendly.”

### **MAINTENANCE DEPARTMENT:**

**Mr. M:**” The systems design is good and easy to understand and maintain, oil required is very less, no steam consumption, very easy to maintain.”

**Mr. X:**” The system connected is very good in performance and also very user friendly, there is no as such maintenance required at the regular intervals as seen in the previous systems for cleaning the nozzles of the ejectors for not getting proper amount of flow of steam, this is very good and automated system.”



<b>EVEREST DRY VACUUM PUMPING SYSTEM Vs XYZ STEAM JET EJECTORS</b>			
<b>Parameters</b>	<b>Units Of Measurement</b>	<b>Steam Jet System</b>	<b>Everest's SUPER VAC 1200m3/Hr</b>
Operating Hours	Hours/ Year	7000	7000
<b>Steam</b>			
- Flow Rate	Kg/Hr.	180	0
- Unit Rate	₹ / kg	1.45	0
Steam Cost	₹/Year	18,27,000	0
<b>Cooling water</b>			
- Flow Rate	m <sup>3</sup> /hr.	15	2.7
- Unit Rate	₹/m <sup>3</sup>	2	2
Water Cost	₹/Year	2,10,000	37,800
<b>Effluent Treatment</b>			
- Flow Rate	m <sup>3</sup> /hr.	0.18	0
- Unit Cost	₹/ m <sup>3</sup>	60	0
Treatment Cost	₹/Year	75,600	0
<b>Nitrogen</b>			
- Flow Rate	LPM/ m <sup>3</sup> /hr.	0	40/ 2.4
- Unit Cost	₹/m <sup>3</sup>	0	4
Nitrogen Cost	₹/Year	0	67,200
<b>Power</b>			
- Units Consumed	kW	10	7.9
- Unit Cost	₹ Per kW/hr	4	4
Power Cost	₹/ Year	2,80,000	2,21,200
<b>Batch Details</b>			
- Time	Hours	42	33.5
- Cost/ Batch	₹	13,389	1,561
- Total Batches/ Year	Nos.	190	238
- Number of Batches Increased	Nos.		48
- Total Savings / Batch	₹		10,753
Additional operational Cost for the differential batches <b>[No. of Batches Increased(48) x Cost/hr for steam jet system(318.8) x Batch cycle time(42)]</b>	₹	6,41,088	0
Total Utility Cost/ Hour	₹	318.8	46.6
Total Utility Cost/ Year	₹	31,91,488	3,72,800
Maintenance Cost/ Year	₹	20,000	5000
<b>Yearly Operating Cost for the Equipment</b>	<b>₹</b>	<b>30,33,688</b>	<b>3,26,800</b>
Operating Cost/ Month	₹/Month	2,67,624	31,483
Dry System Cost Saving / Year	₹	-	27,06,888
Dry System Cost Saving/ Month	₹/Month	-	2,25,574
Installation Cost	₹	-	0
<b>Total Expenditure in Running the Vacuum Systems</b>	<b>₹</b>	<b>30,33,688</b>	<b>3,26,800</b>

**\*\* the payback of Vacuum system was practically received within 7 months , compared to SJE .**





**MAJOR ADVANTAGES:**

- 1)Batch cycle time reduction by 8.5 Hours was seen as compared to the present setup of XYZ.
- 2)Lot of Power saving was seen in Everest Vacuum system as it was consuming only 7.9 units per hour.
- 3)No steam consumption hence lot of steam is saved.
- 4)Lot of cooling water was seen to be as 2.7 m<sup>3</sup>/hr and a reduction upto 10 times was seen.
- 5)Easy to start & Stop, user friendly.
- 6)Better Product Quality was observed by the Production Department.

The Everest Vacuum Pumping System has shown the fruitful results by its exclusive features and excellent performance will be performing well in the future also.

As per the discussions and the meeting with the XYZ Officials in the early stages of the project, they have shown their willingness to replace all the existing pumps with Everest Vacuum Pumps once the performance is observed to be satisfactory with the desired level of savings.

M/S XYZ Pharma , have placed repeat orders for 10 more vacuum systems and have generated many more areas of requirement for placement of orders even further.

**SO WHEN ARE YOU GOING IN FOR DEPENDABLE EVEREST QUALITY AND RELIABLE SERVICES ?**



**Thanks & Regards**

**Everest Process Sales Team**