DUST NUISANCE AT FUEL FEED SYSTEMS IN AFBC BOILERS

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Introduction

Few cases had come to us to solve the issue of dust nuisance at fuel feed system in AFBC boilers. In some boilers, two PA fans are provided in order to have reliability of the system. In some cases, both fans are being run in order to avoid choking problems in fuel lines. This results in high power consumption by boiler auxiliaries. We had diagnosed these cases with engineering approach. In this paper we present how we have solved a case of dust nuisance. In a running plant no one takes a risk unless there is a conviction to adopt a trial & improvement. The plant manager went ahead with us though the OEM was reluctant to take the risk.

Photo 1: The dust nuisance experienced at PA lines. The lines get choked often and then dechoking led to coal accumulations at feeder floor.

Problem

There are two AFBC boilers at this plant. The plant uses Indonesian coal with total moisture of 25%. The surface moisture exceeds 15%. The fuel lines used to get choked. There was dust nuisance due to this. OEM maintained that the surface moisture has to be limited to a maximum of 10%. There are installations with higher moisture levels, for e.g. Kutch & Neyveli Lignites.

There were three stages of the diagnosis and improvement made in solving the problem. At the 1st stage, the mixing nozzles were studied insitu. Mixing nozzle itself was used as flow meter. In 2nd stage, the PA fan flow studies were done using pitot tube. In stage 3, new mixing nozzles were installed and the performance improvements were realised.

PART 1- MIXING NOZZLE STUDIES

The customer desired that we do something about the dust nuisance. We conducted air flow studies with and without coal. We even dismantled some mixing nozzles to understand what makes to choke the lines.

Mixing nozzle suction at throat

We checked whether there is suction at venturi throat area with & without fuel. We found that there was +ve pressure when the fuel was dropped. Positive pressure at throat can create dust deposits in fuel feed chutes. Slowly lumps begin to form and these lumps interrupt the fuel flow in lines. Positive pressure could occur if the PA fan is undersized or if the throat size is larger than requirement. Table below shows operating with two PA fans could create more suction at throat.

PA damper %	PA header pr, mmWC	MX nozzle inlet pr, mmWC	Throat pr, mmWC	MX nozzle outlet pressure, mmWC
No coal – with one PA fan				
70% open	1030	990	-120	530
100%	1092	1055	-170	530
With coal- with one PA fan				
70% open	1028	990	± 125	530
100%	1075	1055	± 90	530
With coal- with two PA fans				
35% open	1300	1250	-260 to -60	560

The mixing nozzle works on the Bernoulli principle. Suction should be available at throat when the fuel drops in. Minor pressurization up to + 25 mmWC can be accepted and will not be creating dust nuisance. If not, the fuel would back out causing troubles in line choking / feed chute choking. Sufficient suction would not develop when the air flow is less / mixing nozzles are not as per design.

PA fan capacity

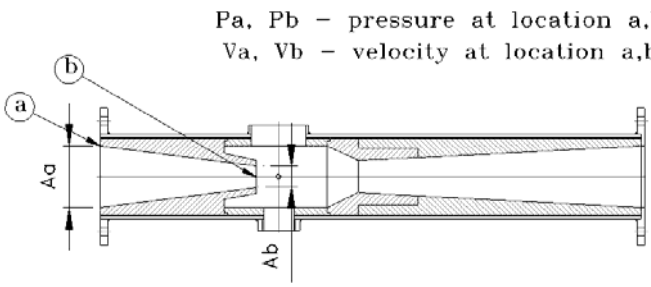
Then we checked that the fan design parameters and we found that the PA fan had good amount of margin too. When we operated two PA fans there was enough suction at throat. There was a need to establish the air flow rate taking place in present condition. This was because the fan was consuming more power than what was as per test at MCR flow.

Mixing nozzle as a flow measurement device

Venturi tube is a flow measuring device and regularly being used by engineers. The Bernoulli principle is used here to measure the air flow. Since we measured the pressures at inlet, outlet and at throat without / with air flow, the air flow can be calculated using Bernoulli principle. The fundamental principle and our findings are as below.

The tappings available at mixing nozzle inlet, throat and at outlet were provided with manometer. The pressure profiles were taken and presented in table 1. Applying Bernoulli equation we could find out the air flow.

The theory



MIXING NOZZLE CONFIGURATION

As long as the fluid speed is sufficiently subsonic (V < mach 0.3), the incompressible Bernoulli's equation (equation 1) describes the flow. Applying Bernoulli equation to air stream travelling down the axis of the horizontal tube gives the equation 2 & 3.

$$P_a + \frac{V_a^2 \rho}{2} + g\rho Z_a = P_b + \frac{V_b^2 \rho}{2} + g\rho Z_b - (equation - 1)$$

$$P_a + \frac{V_a^2 \rho}{2} = P_b + \frac{V_b^2 \rho}{2} - (equation - 2)$$

$$\Delta P = P_a - P_b = \frac{V_b^2 \rho}{2} - \frac{V_a^2 \rho}{2} - (equation - 3)$$

$$\Delta P = \frac{1}{2}\rho V_a^2 \left[\left(\frac{A_a}{A_b} \right)^2 - 1 \right] (equation\ -4)$$

$$Q = \sqrt{\frac{2\Delta P}{\rho}} \frac{A_a}{\sqrt{\left[\left(\frac{A_a}{A_b} \right)^2 - 1 \right]}} (equation\ -5)$$

$$Q = C * \sqrt{\frac{2 * \Delta P}{\rho}} \frac{A_a}{\sqrt{\left[\left(\frac{A_a}{A_b} \right)^2 - 1 \right]}} (equation\ -6)$$

From continuity, the throat velocity V_b can be substituted out of the above equation to give, Solving for the upstream velocity V_a and multiplying by the cross-sectional area A_a gives the volumetric flow rate Q,

Ideal, non-viscous fluids would obey the above equation. The small amounts of energy converted into heat within viscous boundary layers tend to lower the actual velocity of real fluids somewhat. A discharge coefficient C is typically introduced to account for the viscosity of fluids, C is found to depend on the Reynolds Number of the flow, and usually lies between 0.90 and 0.98 for smoothly tapering venturis.

Higher PA header pressure results in increased pressure drop (ΔP) and thus the Q increases. If PA header pressure is increased and as the downstream pressure is fairly constant due to fluidized bed back pressure, the suction at throat improves.

Calculation & inference

1. Using Bernoulli principle, we calculated that the line velocity to be as high as 24 m/s. Even then the suction was not enough. It meant the energy was not used up in creating good suction at venturi.
2. It was also seen that the PA lines were currently operating on high line velocities. The erosion seen in bed coils confirmed this. The erosion rate was more where the coils were close the fuel nozzle cap.
3. Two mixing nozzles were dismantled & seen. The throat diameters were measured to be 50 & 48 mm. We recommended that the mixing nozzle is replaced with 42 mm throat mixing nozzles so that the air flow is reduced simultaneously improving the suction.

4. From the current readings of PA fan, we could see that the PA fan was operating with utterly low efficiency. We advised to carry out the performance testing of PA fan insitu. The performance test done at fan manufacturers' works would be with a test rack that is done without IGV / without a suction box. There can be ducting engineering defect which can cause poor performance of the PA fan. Many cases have been observed to be related to poor inlet conditions.

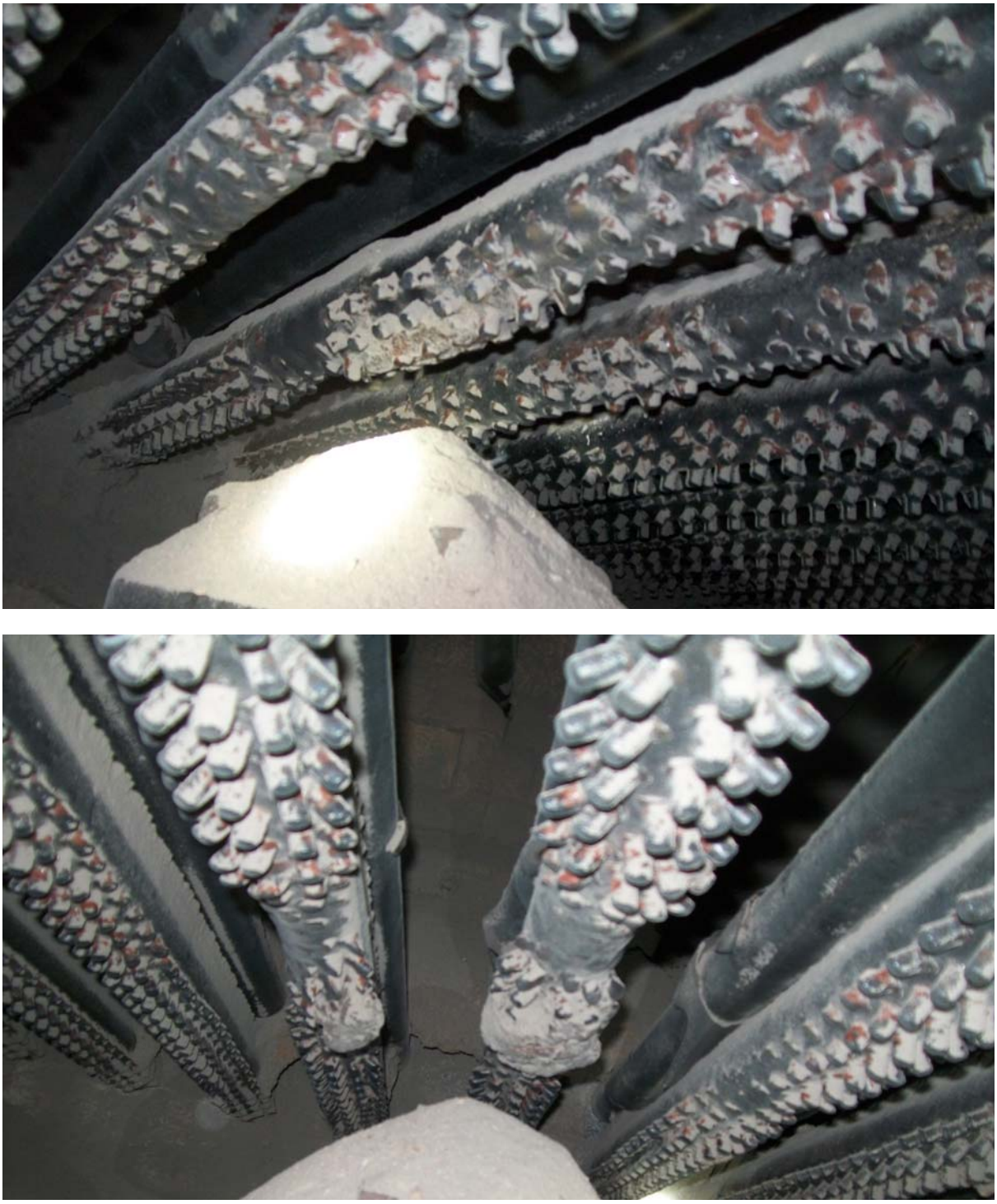


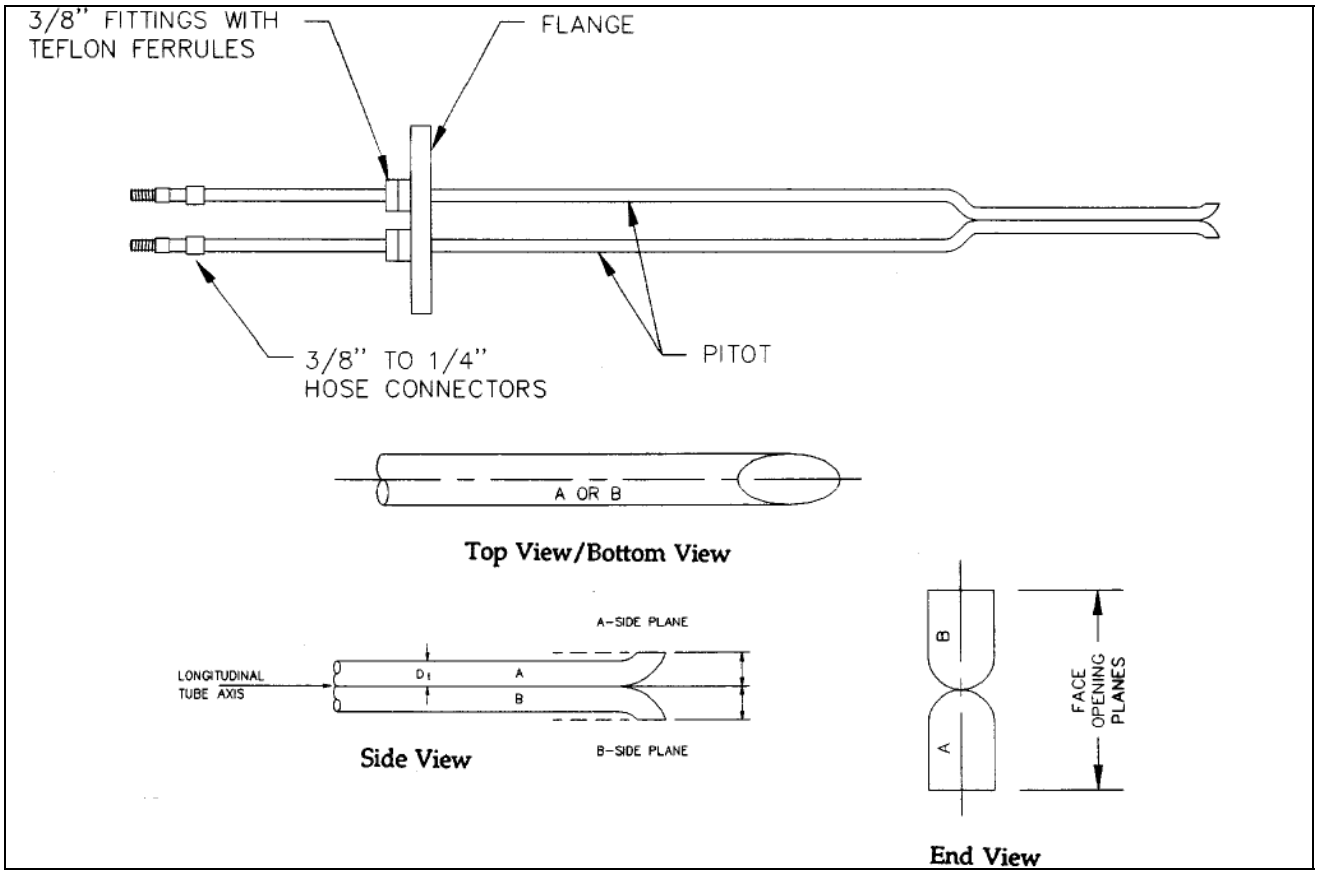
Photo 2 & 3: It is seen the protective coating by phoscast is seen dislodged. Right above the fuel nozzles only the erosion is seen. This can happen due to high fuel line air flow.

PART 2: AIR FLOW MEASUREMENT IN PA DUCT SYSTEM BEFORE MIXING NOZZLE CHANGE

The Fan supplier was reluctant to carry out the performance test, perhaps he knew the result would not be favorable to his company. In the meantime, we procured a pitot tube only to do it ourselves. The test was conducted on PA fans of both boilers.

Fundamentals of Pitot tube

The picture below shows a S type pitot tube used for inferring the velocity in a air / gas duct.



The Pitot tube has two ports. One port faces fluid flow directly and hence measures the pressure and velocity head. The second port which faces downstream of flow measures only pressure head. Hence the differential pressure measured is nothing but the velocity head. This equation 1 is Bernoulli equation. In a horizontal duct this Z_1 equals Z_2. Hence equation reduces to equation 2.

$$P_1 + \frac{V_1^2 \rho}{2} + g\rho Z_1 = P_2 + \frac{V_2^2 \rho}{2} + g\rho Z_2 - (equation - 1)$$

$$P_1 + \frac{V_1^2 \rho}{2} = P_2 + \frac{V_2^2 \rho}{2} - (equation - 2)$$

The front port measures the total head of ($P_1 + (V_1^2 \rho)/2$)

At port facing downstream we measure only static pressure P_2 and hence the differential pressure ΔP is nothing but a measure of $(V_1^2 * \rho / 2)$. Therefore V_1 = Sqrt (ΔP * 2 /ρ). Since the ΔP is measured in mmWC (manometer fluid), conversion to actual fluid density is required. Pitot measurement is resorted to for fan performance studies / to resolve combustion problems.

Details of Pitot study

The velocity of air in PA fan discharge duct was inferred using a Pitot tube meter. The measurements were taken through the tappings in the duct along the length and height. The duct width and height were 650 mm and 1000 mm respectively. The velocity measurements were carried out at various traverse points and they were found to be approximately equal. The measured differential pressure readings are given in table 1.

Table 1: Differential pressure measurement readings by Pitot

S.no	ΔP (mmWc)	ΔP (mmWC)
	Width wise	Height wise
1	14.9	14.6
2	14.0	14.2
3	15.2	14.8
4	14.3	15.0
5	15.5	14.3
6	14.2	14.8
7	14.3	
Avg	**14.63**	**14.62**

Pitot tube

Actual velocity inside duct, $V = K_p * C_p * sqrt (\Delta P_{(avg)}) * sqrt (T_s / P_s * M_s)$

Kp, Dimensional constant	=	34.97
Cp, Pitot tube coefficient	=	0.85
ΔP(avg), Average differential pressure	=	14.62 mmWC
Ts, Temperature inside the duct	=	433 K
Ps, PA fan header pressure	=	1054 mmWC (g) = 83.75 mmHg (a)
Ms, Molecular weight of air	=	28.3
V, Actual velocity, m/s	=	34.97*0.85*sqrt (14.62)*sqrt(433/83.75*28.3))

= 15.364 m/s

Actual power consumption from voltage and current readings

Power	=	sqrt (3) * V * I * Cos Ø
V, Voltage	=	430 V
C, Current	=	174 A
Cos Ø, power factor	=	0.85
Power consumed by PA fan	=	sqrt (3) * 430 * 174 * 0.85
	=	110153 Watts
	=	**110.153 kW**

PA fan efficiency calculated from Power consumption

V, velocity of air flow	=	15.364 m/sec
A, duct flow area	=	(650 * 1000 / 10^6) m^2 = 0.65 m^2
Q, PA fan flow	=	**A * V = 9.98 m^3/sec**
H, head developed by fan	=	discharge pressure - suction pressure
	=	1054 – 707 = 347 mmWc
PA fan shaft power	=	(Q * H * 100)/ (efficiency * 101) kW
PA fan motor power	=	1.05 * shaft power
Shaft power	=	PA fan motor power /1.05
	=	110.153/1.05
	=	104.90 kW
Efficiency	=	(Q * H * 100)/ (motor shaft power *101)
	=	(9.98 * 347 * 100) / (104.91 * 101)
	=	32.68 %

FINDINGS AFTER THE PITOT TEST

1. The actual flow from PA fan was greater than the rated flow. Rated flow of PA fan was 8.43 m3/s, whereas actual flow was 9.98 m3/s.
2. The PA line velocity as per calculation was calculated to be 24.3 m/s. This tallied with flow calculated from venturi method. Design velocity for a PA line is 16 m/s.
3. It was clear that the new mixing nozzles could be tried to improve the conveying and to reduce the erosion of bed coils.
4. The low efficiency of PA fan could be due to poor inlet duct condition of PA fan.

PART 3: STUDY OF NEW MIXING NOZZLE PERFORMANCE

The new mixing nozzles were procured and installed in boiler no 1. We took up the study on the performance of new mixing nozzles as per customer requirement. At the time of test, both the boilers were running at full load. Boiler no 1 was running with a single ID fan. The boiler no 2 was being run with two PA fans. The two PA fans were being run in boiler no 2, in order to avoid line choking. The study included the measurement of throat pressure with & without coal. At the time of testing the coal fired was having inherent moisture of 14%. The total moisture of coal as received was 25%. Hence the surface moisture was in the range of 11%. By mixing the fly ash to an extent of 3%, the resultant surface moisture is 10.67%.

Measurement of PA fan flow rate in Boiler 1 and check on fan efficiency

The first study was on the need for the minimum header pressure to make the throat pressure negative while feeding coal. It was seen that the throat pressure could be made negative even at 1200 mmWC header pressure with a wind box pressure of 830 mmWC. At 1500 mmWC, higher suction pressures could be obtained. See photos at the end. At the fuel feeder inspection door, the suction was felt to be quite high.

Though 1200 mmWC pressure was adequate, operators preferred to keep 1500 mmWC. This was done, as it helped to keep the leg chutes & mixing nozzle chutes free from blockages. Hence the PA flow was checked at 1300, 1400 and 1500 mmWC pressures. The following are the findings.

- The air flow was measured to be 8.82, 7.67 & 7.49 m3/s when the header pressures were 1520, 1404 & 1304 mmWC.
- The PA line velocities were calculated to be 21.5, 18.7 & 18.3 m/s respectively.
- The PA fan current was measured to be 184, 171 & 164 amps, when the header pressures were 1520, 1404 & 1304 mmWC respectively.
- The power consumed by the PA fan was 120.5, 111.9 and 107.4 kW, when the header pressures were 1520, 1404 & 1304 mmWC respectively.
- The head added by PA fan was 690, 574 & 474 mmWC, respectively.
- The PA fan efficiencies were worked out to be 50, 38.9 & 32.7 %, when the header pressures were 1520, 1404 & 1304 mmWC respectively.
- The PA fan efficiencies as per predicted performance curve should have been 74, 76 & 76.5 %, when the header pressures were 1520, 1404 & 1304 mmWC respectively.

Measurement of PA fan flow rate in Boiler 2 and check on fan efficiency

The first study was on the need for the minimum header pressure to make the throat pressure negative while feeding coal. It was seen that the throat pressure could be made negative at 1260 mmWC header pressure. Two PA fans were to be run to achieve this effect. The air flow was measured using pitot tube.

- The head added by fan was 520 mmWC.
- The PA fan power consumed was 177.4 kw. The PA fan power consumed at boiler no 2 was 107.4 kW to produce a minimum suction at throat of mixing nozzle.

Comparison of performance of new mixing nozzle

The new mixing nozzle had reduced the air flow as indicated by the air flow measurement and the power consumption. The high suction that could be created helped in sucking the wet coal without causing a bridging effect and venturi throat. The fuel feeder floor is now clean and the leg chute jamming by wet coal is reduced drastically. The fuel feeder was seen to be at high vacuum as can be seen from photographs.

Comparison of power consumption by PA fan in boiler 1 & 2

The new mixing nozzle consumed 107.4 kW as against 177.4 kW to produce the minimum vacuum at throat. However the boiler operators now preferred to keep higher header pressure so that the bridging of wet coal in leg chute was reduced greatly. The power consumed for the same is 120.5 kW. On the net comparing boiler 1 & 2, there is a power saving of 57 kW.

What could be the reason for reduced fan efficiency?

For the condition of 1520 mmWC header pressure, the fan power should have been 86 kW only (with an efficiency of 70% as per fan performance curve) as against present 120.5 kW. If the header pressure was only 1304 mmWC, with a fan efficiency of 70%, the fan power should have been only 50 kW. At least one can say, there is a loss of 120.5-86 = 34.5 kW now by virtue of poor efficiency of PA fan. The reason can be defective inlet conditions assuming the impeller design is correct.

- It is possible that the suction box is undersized producing an effect of 90 deg turn at inlet of fan.
- Further the IGV provided at fan inlet with a high entry velocity can be an added disadvantage. The preferred free length at front of fan has to be three times the inlet diameter.
- The recirculation of air flow through standby fan is possible. Guillotine gate eliminates the possibility of recirculation.

Problem bridging in mixing inlet chute & leg chute

During the visit, the problem of leg chute choking was studied. When the mixing nozzle develops negative pressure, the fuel that is fed into the mixing nozzle flows freely. In case of any occasion of choking at throat cross by a coal powder lump, the positive pressure created at throat leads to bridging of wet coal in the mixing nozzle inlet chute. This is unavoidable. On inspection of each chute at mixing nozzle inlet, the following points were noted to be a concern for bridging of wet coal.

- It was seen that the SS liner plates were tack / stitch welded to chutes. These weld beads offered as sites for the dust to build up. Instead of liner plates, the chute should have been made of SS plates. Or else the liner plates should have been plug welded from back, through some drilled holes in the chute.
- It was seen that the flange setting was not proper in a chute that was removed for inspection.
- It was seen that the packing ropes were projecting inside the coal flow path. These can form sites for coal dust to build up.

Final conclusion

- The mixing nozzles have met the intentions of its purpose of achieving suction effect with lesser air flow.
- The mixing nozzle inlet chutes need to be corrected for smooth flow of coal.
- The PA fan needs a properly designed suction box to reduce the power consumption.

Photo 4: The suction effect seen at feeder in boiler no 1, where the mixing nozzles were replaced by a lower diameter throat. The feeder area was now seen to be free of dust.

Photo 5: Suction effect seen at feeder discharge chute to mixing nozzles.

Photo 6: The effect of new mixing nozzle in boiler no 1 could be seen here. The feeder was operating at 1300 mmWC at this time.

Photo 7: The feeder was seen to be under positive pressure in boiler no 2, where two PA fans were in operation. With this puffing, the coal dust would choke up the mixing nozzle inlet chute due to dust coating the inlet chute. The caked dust could ultimately fall in to the mixing nozzle stopping the coal flow.

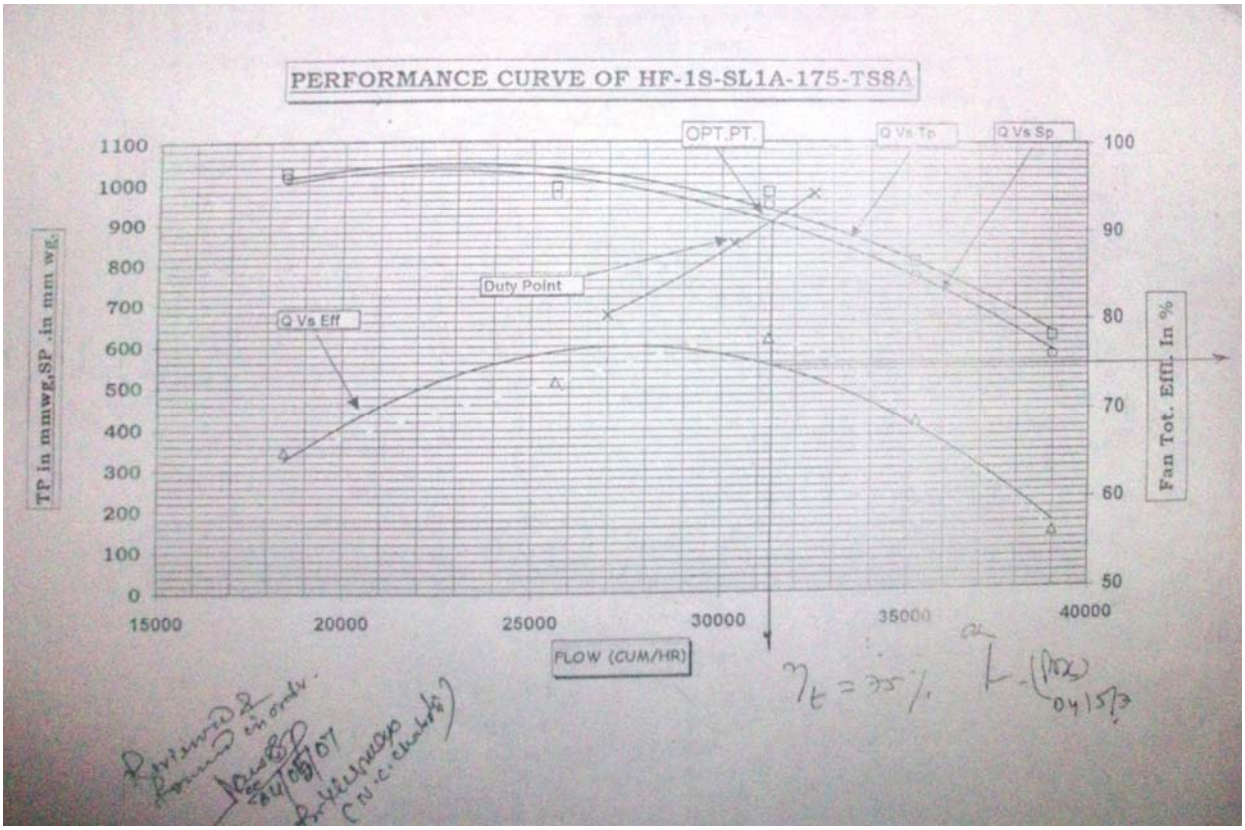


Photo 8: As per the PA fan performance curve, for the PA flow range of 27000 to 32000 m3/h, the efficiency of the PA fan should have been above 70%. The efficiency of PA fan was actually seen to be 30 to 40% only.


Photo 9: The asbestos pad provided above the mixing nozzle was seen to be projecting in to the coal path. Wet coal dust could get a support over this and eventually lead to arching.

Photo 10: Coal dust seen to build up on the sloped plate of mixing nozzle inlet chute. The coating was seen to be quite strong. Incidentally all the old mixing nozzle inlet chutes were seen to be like this.

Photo 11: The same chute plate after cleaning is seen here. The dust is seen to have built up on the weldment of liner plate.

Photo 12 & 13: The effect of tack / stitch weld was seen very well in this chute, which was dismantled from position in boiler no2 during the visit. The weld beads had acted as nuclei for dust build up. Ideally the weld should not be present in the coal path.

Photo 14: Mismatch in flange setting is seen here. Such protrusions can act as support for wet coal dust.

Photo 15: In one of the mixing nozzles, it was found that the coal lump was lying above throat. The Coal dust could build up from here.

Photo 16 & 17: The above were snaps from old mixing nozzle inlet chutes. The coal dust was seen sticking inside the mixing nozzle inlet chute. This must have occurred more in the old mixing nozzles, as they were always on positive pressure at throat.

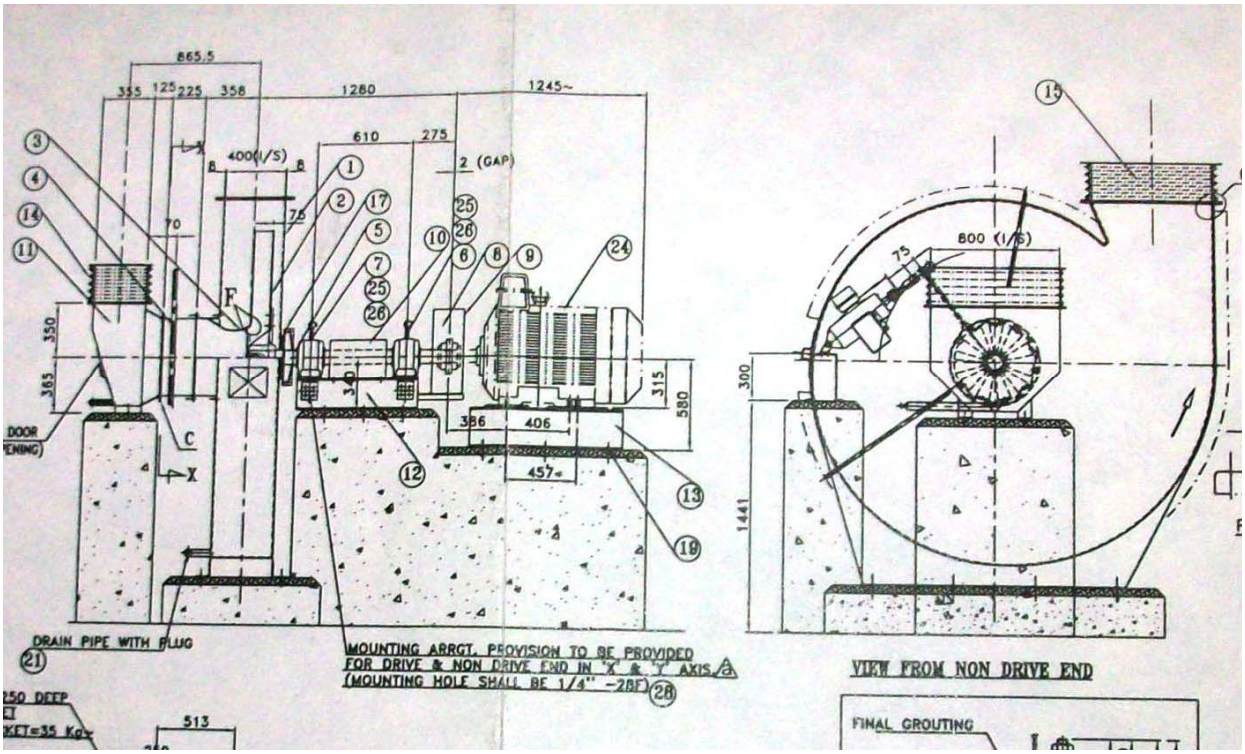


Photo 18: The drawing of PA fan is seen here. The inlet box seemed to be small as compared to fan impeller size. Moreover IGV comes in the path of air flow at high velocity zones. The IGV could block the air flow instead of swirling it.

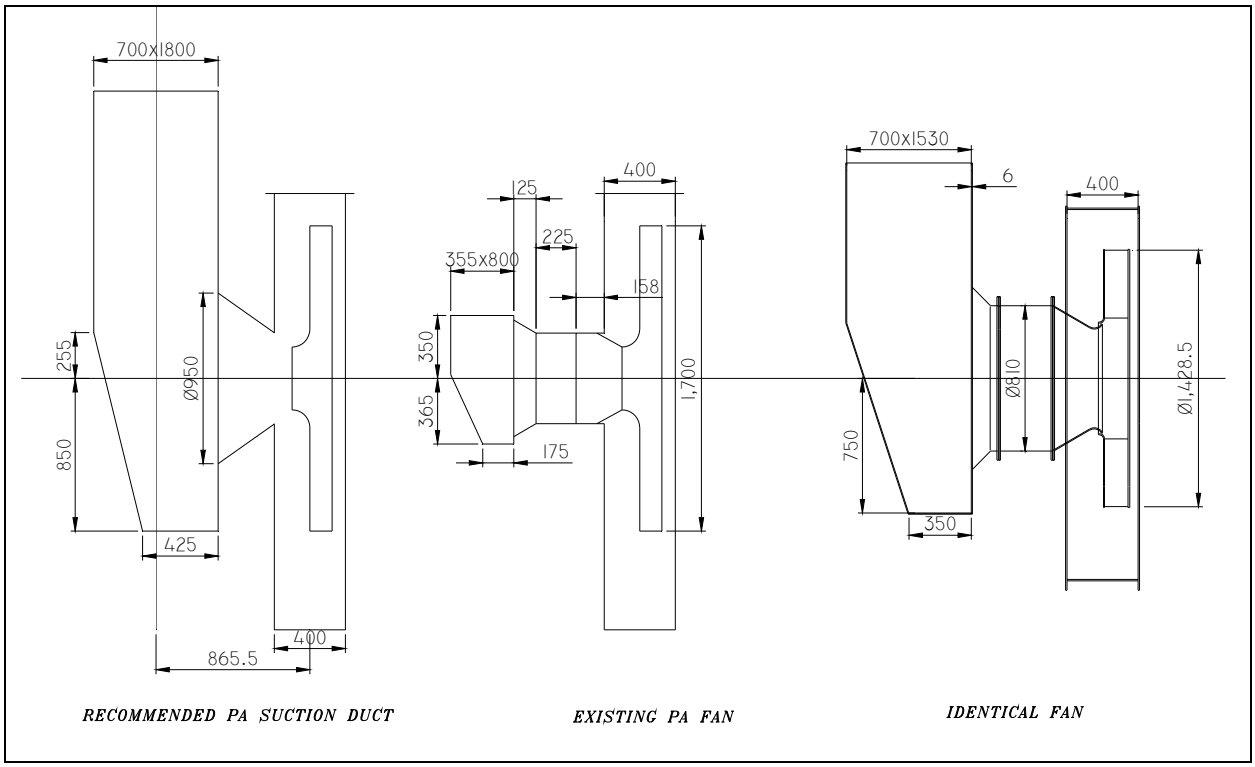


Figure 1: The PA fan inlet box was found to be too small in comparison with a better performing PA fan of almost same design parameters. Small suction box with IGV would work as sharp ell duct instead of uniformly distributing suction box.

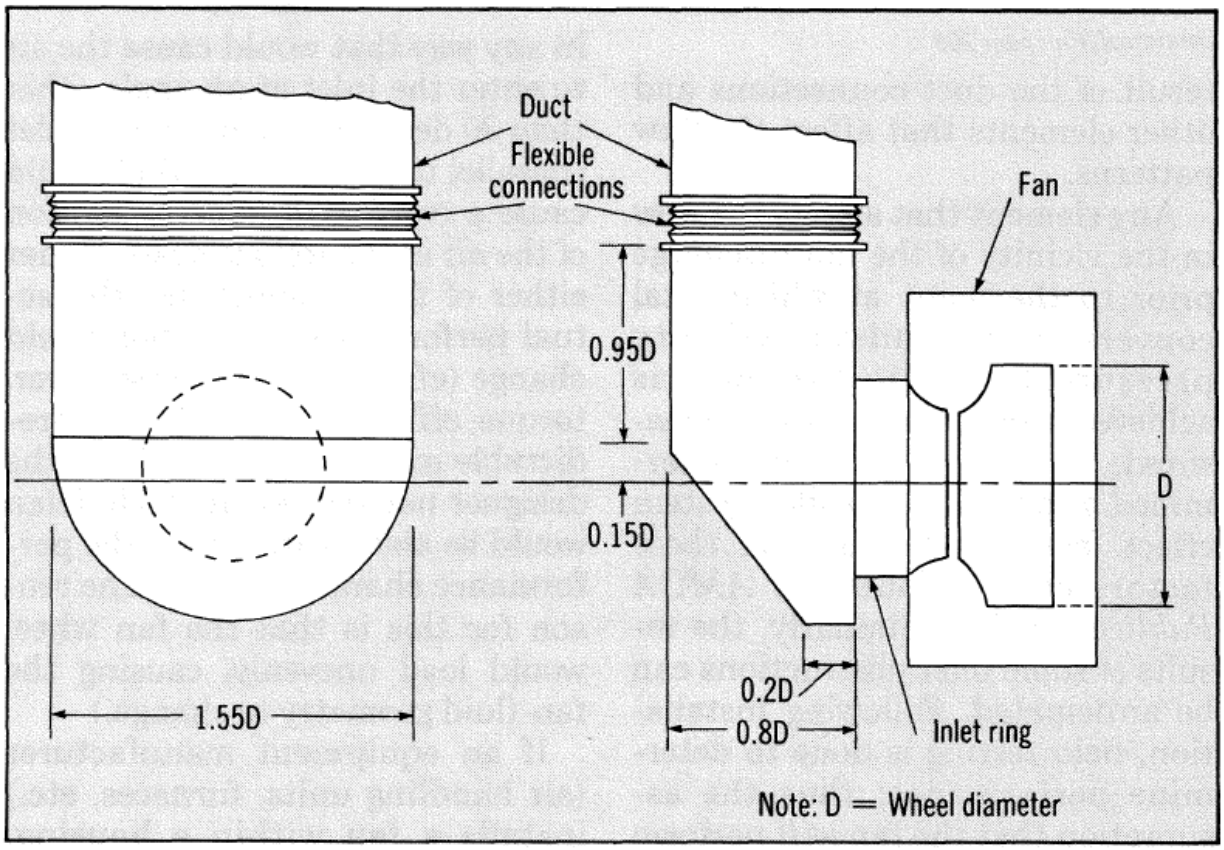


Figure 2: This is a recommended configuration of inlet box by AMCA. The liberally sized suction box would ensure that the test rack performance is achieved.

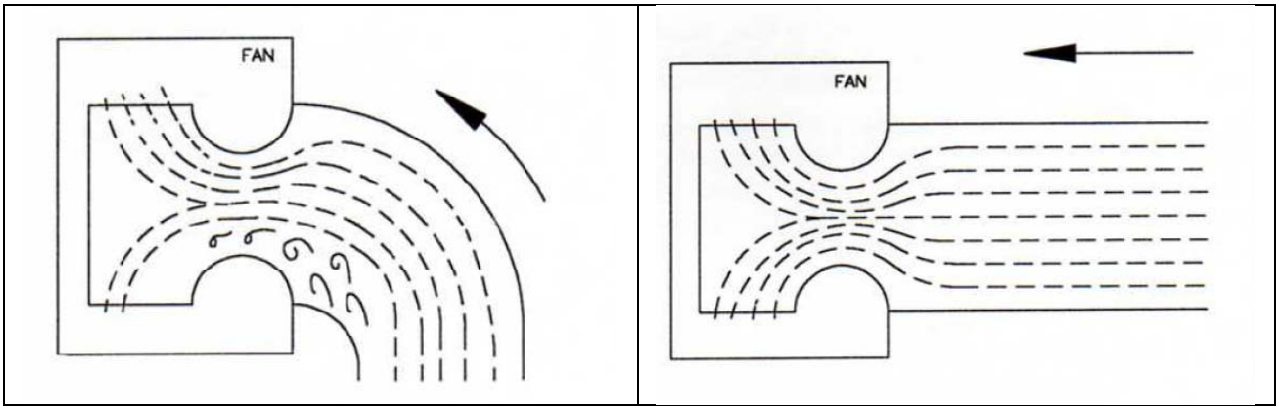


Figure 3 & 4: This is an illustration of air flow into the eye of impeller with a sharp bend & without a bend. Later is preferred by the fan manufacturers.

TANJORE PAINTINGS

Tanjore (or Thanjavur or Thanjavoor) paintings have a very rich heritage. This style of painting has been followed widely by the people in Southern Tamil Nadu for the past two centuries. The art flourished in Tanjavoor, pronounced Tanjore, the capital city of the Chola dynasty, and thus got its name. Maratha princes, Nayaks of Vijaynagar dynasty, Rajus communities of Tanjore and Trichy and Naidus of Madurai patronized the art of Tanjore painting from 16 to 18th centuries. Tanjore paintings are deeply rooted in tradition and still innovative within limits. This art is sacred and dedicated.

The paintings are notable for their adornment in the form of semi-precious stones, pearls, glass pieces and gold. The rich vibrant colors, dashes of gold, semi-precious stones and fine artistic work are characteristics of these paintings. They add beauty and culture to a variety of surroundings and décor. The paintings are mostly of Gods and Goddesses because this art of painting flourished at a time when fine-looking and striking temples were being constructed by rulers of several dynasties. The figures in these paintings are large and the faces are round and divine.

Tracing its roots to the historical golden era of the early 18th century, Tanjore artwork is one of the many indigenous art forms for which India is noted. Originating in Tanjore about 300 kms from Chennai (Madras), which was the then capital of the Gupta empire, this form of art developed at the height of cultural evolvement achieved during that period. Crafted with meticulous care the Thanjavoor (Tanjore) pictures are unique. What sets them apart from Indian paintings in general are the embellishments made over the basic drawings with precious and semi-precious stones as well as the relief work which gives them a three dimensional effect. The pictures are of various sizes, ranging from huge works spanning whole walls to small miniatures no longer than 6-inch square. The paintings decorate the puja rooms in residences, arcades in major hotels and lobbies in Corporate Offices. They also make nice gifts for Diwali, Weddings and other special occasions.

Technique

The process of making a Tanjore painting involves many stages. The first stage involves the making of the preliminary sketch of the image on the base. The base consists of a cloth pasted over a wooden base. Then chalk powder or zinc oxide is mixed with water-soluble adhesive and applied on the base. To make the base smoother, a mild abrasive is sometimes used. After the drawing is made, decoration of the jewellery and the apparels in the image is done with semi-precious stones also known as Jaipur stones. Laces or threads are also used to decorate the jewellery. On top of this, the gold foils are pasted. Finally, dyes are used to add colors to the figures in the paintings. High-quality gold foil is used to ensure that the paintings last generations. They generally appreciate in value and are considered collectibles. Paintings come in three finishes, Classic, Antique Style and Embossed. In the classic finish, bold colors and striking backgrounds are combined with high-glitter gold foil, while in the antique style, the gold's glitter is more sober, with more subtle colors and plain backgrounds. The embossed paintings are similar to the classic style but are embossed to bring about more depth.

In case you are interested in having a Tanjore painting of your favourite God / Goddess, contact Mrs.Meena Asokkumar at email ID- *kasokku@gmail.com , meenaasokkumar@gmail.com.*

Translated from – Pandit Shriram Sharma Acharya's work –forwarded by Mr.M.M.Rathi-Shree Cements Ltd

Oh child of God ! be God !

Human powers, abilities are unlimited and are as infinite as the sky. Every human being is a symbolic representative of the divine consciousness. He possesses within himself all those abilities that are present in his Father - the Almighty.

If the Yog [union] of a soul and the Supreme Soul is made possible; even a meek and most normal-seeming human being can become the Supreme Being - God and his greatness will be equally vast. Maya is the one, which fabricates the difference between the soul and Supreme Soul, and she is nothing more than a mere veil of ignorance.

As we are entangled in worldly attractions, running after fickle wealth and ridiculously greedy desires it's difficult for us to understand that the unusually rare opportunity of possessing a human body has been given to us and it must be used for the fulfillment of a specific purpose. Let us just not worry about the pleasures of the body but also keep in mind the contentment of the soul. If we realize our true nature, understand our duties and resolve promptly to do as needed, we can easily get rid of the sense of insignificance and unrest, which constantly unnerves us.

To break free from this spell of ignorance is the supreme duty of any human being. The person who performs this duty faithfully can lay claim to the greatness of God the Almighty and become God Himself.

Be Good and Do Good

The truth behind performing good deeds to gain entry into heaven may be debatable. There are some references about such idea in the scriptures but its fundamental aim is to motivate people to follow the path in life which is moral and good for the self and the society at large.Getting a sick child take medicine is a great challenge. A mother has to resort to cajoling the child into taking medicine by saying that she would reward him with a toy. The child does not know the worth of the medicine, but he does know the worth of a toy. In the hope of getting rewarded with a toy, he takes the medicine which works in his best interest.

Similarly, an average individual does not appreciate the worth of living a high ideal life. Sensual pleasures are what interests him more. He can visualize his interest of securing the heavens which is the happiness he is seeking for. The prospects of heaven makes him take up a worthy course in life. This can't be thought of as a deceit or a lie as it would indeed usher him in the direction which has much more to offer than the said reward.

Why society?

The main difference between man and animal is that man establishes and lives in a society and progresses together through cooperation and mutual support whereas animals mostly live isolated self-contained lives. Animals fulfill their own needs one way or another by themselves or live in groups and jointly defend themselves against predators. This, however, this isn't good enough to be

tagged as living in a society. On the other hand, it is man's second nature to live in society or have a community spirit. It is absolutely inherent in his nature or his innate instinct.

The offspring of birds and animals become self-reliable very quickly after their birth and therefore, they forget their intimate connection (blood relation) with their parents. This may one of the underlying factors responsible for the lack of lasting mutual loving and caring feelings amongst them. On the other hand, human beings remain dependent on their parents or guardians for very long after birth which may be one of the main reason for their lasting mutual bond.If we ponder a bit more deeply on this subject, we will understand that the dependence of offspring on their parents or guardians do not end when they become adults but keep existing as have to rely on the society in countless areas in life.

Be Good and Do Good

The truth behind performing good deeds to gain entry into heaven may be debatable. There are some references about such idea in the scriptures but its fundamental aim is to motivate people to follow the path in life which is moral and good for the self and the society at large.Getting a sick child take medicine is a great challenge. A mother has to resort to cajoling the child into taking medicine by saying that she would reward him with a toy. The child does not know the worth of the medicine, but he does know the worth of a toy. In the hope of getting rewarded with a toy, he takes the medicine which works in his best interest.

Similarly, an average individual does not appreciate the worth of living a high ideal life. Sensual pleasures are what interests him more. He can visualize his interest of securing the heavens which is the happiness he is seeking for. The prospects of heaven makes him take up a worthy course in life. This can't be thought of as a deceit or a lie as it would indeed usher him in the direction which has much more to offer than the said reward.

Just make not break too

Secret to good gardening lies not only in nourishing the plants but also in pruning the weeds. Plants need to be cared after, given nourishments, yes but the weeds need to be trimmed too. Only then the dream of a beautiful garden can be realized.

In much the same way, secret of self-progress lies in not only constructive activities like reading, contemplation, pious company, religious observances but also in performing corrective actions necessary for self reform. For the eradication of negative imprints and inferior traits we need to undergo the arduous penance of introspection and self-reform.

For progress and reform it is necessary to adopt a balanced approach that does justice to both aspects of the process. It was the vile side effect, of our extremist, inappropriately lax and one-sided religiousness that India had to suffer the curse of long political enslavement, which lasted for a thousand years.

Yes we must foster that which is good and noble, but the eradication of what is bad and vile is our pious duty too. Only if we fully understand and appreciate this eternal truth, can each one of us uphold justice and strike down injustice like it was done in the days of yore.

LOVELY ARTICLE SHARED -------

IN A RELATIONSHIP, MARRIED OR NOT... YOU SHOULD READ THIS!

by Kimmies Floral

When I got home that night as my wife served dinner, I held her hand and said, I've got something to tell you. She sat down and ate quietly. Again I observed the hurt in her eyes. Suddenly I didn't know how to open my mouth. But I had to let her know what I was thinking. I want a divorce. I raised the topic calmly.

She didn't seem to be annoyed by my words, instead she asked me softly, why?

I avoided her question. This made her angry. She threw away the chopsticks and shouted at me, you are not a man! That night, we didn't talk to each other. She was weeping. I knew she wanted to find out what had happened to our marriage. But I could hardly give her a satisfactory answer; she had lost my heart to Jane. I didn't love her anymore. I just pitied her!

With a deep sense of guilt, I drafted a divorce agreement which stated that she could own our house, our car, and 30% stake of my company.

She glanced at it and then tore it into pieces. The woman who had spent ten years of her life with me had become a stranger. I felt sorry for her wasted time, resources and energy but I could not take back what I had said for I loved Jane so dearly. Finally she cried loudly in front of me, which was what I had expected to see. To me her cry was actually a kind of release. The idea of divorce which had obsessed me for several weeks seemed to be firmer and clearer now.

The next day, I came back home very late and found her writing something at the table. I didn't have supper but went straight to sleep and fell asleep very fast because I was tired after an eventful day with Jane.

When I woke up, she was still there at the table writing. I just did not care so I turned over and was asleep again.

In the morning she presented her divorce conditions: she didn't want anything from me, but needed a month's notice before the divorce. She requested that in that one month we both struggle to live as normal a life as possible. Her reasons were simple: our son had his exams in a month's time and she didn't want to disrupt him with our broken marriage.

This was agreeable to me. But she had something more, she asked me to recall how I had carried her into out bridal room on our wedding day.

She requested that every day for the month's duration I carry her out of our bedroom to the front door ever morning. I thought she was going crazy. Just to make our last days together bearable I accepted her odd request.

I told Jane about my wife's divorce conditions. . She laughed loudly and thought it was absurd. No matter what tricks she applies, she has to face the divorce, she said scornfully.

My wife and I hadn't had any body contact since my divorce intention was explicitly expressed. So when I carried her out on the first day, we both appeared clumsy. Our son clapped behind us, daddy is holding mommy in his arms. His words brought me a sense of pain. From the bedroom to the sitting room, then to the door, I walked over ten meters with her in my arms. She closed her eyes and said softly; don't tell our son about the divorce. I nodded, feeling somewhat upset. I put her down outside the door. She went to wait for the bus to work. I drove alone to the office.

On the second day, both of us acted much more easily. She leaned on my chest. I could smell the fragrance of her blouse. I realized that I hadn't looked at this woman carefully for a long time. I realized she was not young any more. There were fine wrinkles on her face, her hair was greying! Our marriage had taken its toll on her. For a minute I wondered what I had done to her.

On the fourth day, when I lifted her up, I felt a sense of intimacy returning. This was the woman who had given ten years of her life to me.

On the fifth and sixth day, I realized that our sense of intimacy was growing again. I didn't tell Jane about this. It became easier to carry her as the month slipped by. Perhaps the everyday workout made me stronger. She was choosing what to wear one morning. She tried on quite a few dresses but could not find a suitable one. Then she sighed, all my dresses have grown bigger. I suddenly realized that she had grown so thin, that was the reason why I could carry her more easily.

Suddenly it hit me... she had buried so much pain and bitterness in her heart. Subconsciously I reached out and touched her head.

Our son came in at the moment and said, Dad, it's time to carry mom out. To him, seeing his father carrying his mother out had become an essential part of his life. My wife gestured to our son to come closer and hugged him tightly. I turned my face away because I was afraid I might change my mind at this last minute. I then held her in my arms, walking from the bedroom, through the sitting room, to the hallway. Her hand surrounded my neck softly and naturally. I held her body tightly; it was just like our wedding day.

But her much lighter weight made me sad. On the last day, when I held her in my arms I could hardly move a step. Our son had gone to school. I held her tightly and said, I hadn't noticed that our life lacked intimacy.

I drove to office.... jumped out of the car swiftly without locking the door. I was afraid any delay would make me change my mind...I walked upstairs. Jane opened the door and I said to her, Sorry, Jane, I do not want the divorce anymore.

She looked at me, astonished, and then touched my forehead. Do you have a fever? She said. I moved her hand off my head. Sorry, Jane, I said, I won't divorce. My marriage life was boring probably because she and I didn't value the details of our lives, not because we didn't love each other anymore. Now I realize that since I carried her into my home on our wedding day I am supposed to hold her until death do us apart.

Jane seemed to suddenly wake up. She gave me a loud slap and then slammed the door and burst into tears. I walked downstairs and drove away.

At the floral shop on the way, I ordered a bouquet of flowers for my wife. The salesgirl asked me what to write on the card. I smiled and wrote, I'll carry you out every morning until death do us apart.

That evening I arrived home, flowers in my hands, a smile on my face, I run up stairs, only to find my wife in the bed - dead.

My wife had been fighting CANCER for months and I was so busy with Jane to even notice. She knew that she would die soon and she wanted to save me from the whatever negative reaction from our son, in case we push thru with the divorce.-- At least, in the eyes of our son--- I'm a loving husband....

The small details of your lives are what really matter in a relationship. It is not the mansion, the car, property, the money in the bank. These create an environment conducive for happiness but cannot give happiness in themselves. So find time to be your spouse's friend and do those little things for each other that build intimacy. Do have a real happy marriage!

If you don't share this, nothing will happen to you.

If you do, you just might save a marriage.

Many of life's failures are people who did not realize how close they were to success when they gave up.

SIR CHANDRASEKHARA VENKATA RAMAN, FRS

(7 NOVEMBER 1888 – 21 NOVEMBER 1970)

He was an Indian physicist whose work was influential in the growth of science in the world. He was the recipient of the Nobel Prize for Physics in 1930 for the discovery that when light traverses a transparent material, some of the light that is deflected changes in wavelength. This phenomenon is now called Raman scattering and is the result of the Raman effect.

On February 28, 1928, through his experiments on the scattering of light, he discovered the Raman effect. It was instantly clear that this discovery was an important one. It gave further proof of the quantum nature of light. Raman spectroscopy came to be based on this phenomenon, and Ernest Rutherford referred to it in his presidential address to the Royal Society in 1929. Raman was president of the 16th session of the Indian Science Congress in 1929. He was conferred a knighthood, and medals and honorary doctorates by various universities. Raman was confident of winning the Nobel Prize in Physics as well, and was disappointed when the Nobel Prize went to Richardson in 1928 and to de Broglie in 1929. He was so confident of winning the prize in 1930 that he booked tickets in July, even though the awards were to be announced in November, and would scan each day's newspaper for announcement of the prize, tossing it away if it did not carry the news. He did eventually win the 1930 Nobel Prize in Physics "for his work on the scattering of light and for the discovery of the effect named after him. He was the first Asian and first non-White to receive any Nobel Prize in the sciences. Before him Rabindranath Tagore (also Indian) had received the Nobel Prize for Literature.

C.V Raman & Bhagavantam, discovered the quantum photon spin in 1932, which further confirmed the quantum nature of light.

Raman also worked on the acoustics of musical instruments. He worked out the theory of transverse vibration of bowed strings, on the basis of superposition velocities. He was also the first to investigate the harmonic nature of the sound of the Indian drums such as the tabla and the mridangam.

Raman and his student Nagendranath, provided the correct theoretical explanation for the acousto-optic effect (light scattering by sound waves), in a series of articles resulting in the celebrated Raman-Nath theory. Modulators, and switching systems based on this effect have enabled optical communication components based on laser systems. lo

In 1934, Raman became the director of the Indian Institute of Science in Bangalore, where two years later he continued as a professor of physics. Other investigations carried out by Raman were experimental and theoretical studies on the diffraction of light by acoustic waves of ultrasonic and hypersonic frequencies (published 1934-1942), and those on the effects produced by X-rays on infrared vibrations in crystals exposed to ordinary light.