

## *Design Narrative 3*

*a g rao*

### Boiler for Export

I designed a 'Boiler for Export' for Thermax Pvt. Ltd . The company was earlier called Wanson ( India). One of senior professors in Mechanical Engineering Department left IIT and joined Wanson (India). He was a friend of Prof. Nadkarni. He brought couple of projects in Boiler design. The company was specialized in manufacture of 'Steam boilers!' IDC designed '3' boilers. Mine was the last. First one was a portable boiler to give steam and hot water for cleaning in big hotels etc. Chattopadhyay designed this product. He covered up the basic cylindrical unit in an attractive box shape made of sheet metal. When he presented all from the top management were present. It was a big event as it was the first time the company had hired industrial designers. The new design got a lot of appreciation from the company.

The second project was a range of boilers which Athavankar designed. He cleverly separated the control unit from the Boiler unit, which facilitated ease of operation. This was also well received. There used to be an active, (high ego) development engineer in the company. He was in charge of developing new designs. He being a mechanical engineer, it became his task to translate the new designs. He felt he did not get the importance he deserved, when IDC designers presented the design to the management directly!

Then come the third boiler, which I took it up for design! There was a separate unit for exports and the boiler was exported under the name ' Thermomatic'. The export division was handled by a young nephew of the top manager. He had just returned from Canada. He had worked out the collaboration agreement. He was very positive and friendly.

The company imported the central gas burner in the boiler. The rest of the body, outer shell, ducts, steam and hot air tubes,... were designed and developed by the company. They imported the burner with a cost component of 70% of the total and exported the boiler under an agreement to the candian company. It was in the initial stages of manufacture! A working unit was there in Pune! It was a huge 10'dia, 20feet long boiler, with a separate, 'sick looking', self standing control unit. The control unit, made by engineers had poor proportions.

Designing such a functional, production unit was an interesting experience. I met all the engineers concerned to know the working of the unit and how much it could be changed. Company was basically interested in dressing up the boiler for export!

The development engineers were struggling at the leakage of duct joints! The boiler had two huge ducts to recover the hot air from the boiler and feed back into the central burner. Since the burner had to be opened periodically for maintenance, it had '3' joints! Making leak proof joints, when the parts were fabricated in sheet steel, became a difficult task!

The company did not expect me to modify the ducts! They were interested in new looks for the control unit.

I started thinking! The ducts were rather ugly, with a box shape pasted to the horizontal cylindrical boiler! There was no flow in the form I asked the company engineers why there were two ducts! Answer was simple. They want to collect hot air from either side of the central burner.

Then I consulted my friend, Prof. Jagdish, who was a specialist in Heat Transfer.

*Prof. Jagdish was a unique person, unbelievably simple. He was 10 years senior to me. We were both staying in staff Hostel of IIT at that time. I learnt many things from him starting from fundamentals of heat transfer to the refinement of classical music. He introduced me North Indian classical music! The first concert he took me was of Pandit. Bhimsen Joshi. It made new beginning in my design thinking. I could see deep connections between rhythm and form in Music to the very elements of Design later!*

*Jagdish had done lot of Trekking and had a deep knowledge of animals, birds and their behaviour. He told me the fascinating stories of 'Konrad Lorenze' the famous nobel laureate in animal behavior. He could understand my aesthetic concern of the disturbing ducts. I was asking the question, why two ducts, can it be one! He gave me the insight. What mattered was the total area of ducts at the exit point of the boiler. After several discussions we came to the conclusion that one duct with double the area at the exit point could do the job. A deflector inside the boiler could direct the hot air from the other side towards the duct side!*

*'Eureka'!*

*How wonderful to have such a helping expert as a friend!*

Next steps were simple. I could bring in 'flow' in to the 'form' of the duct. A smoother transition from large circular face of the boiler cylinder to a square opening of the gas burner resulted in better looks! With Prof. Jagdish's backing, I immediately consulted the company. The engineers agreed for the change! They were happy that 3 joints got reduced to one! This was a great relief for them! There was no reduction in heat recovery either! I worked on a scale model. A shape with 'flow', yet easy to fabricate in sheet metal was developed. I was glad my aesthetic instinct to make a 'flowing form', actually resulted in a better looking, cheaper, efficient solution. The cost of additional duct and Joints were saved. It also became easy to maintain!

Simultaneously I was working on the control unit. I increased the box size to improve the proportions and added a base to lift it up. Several sketches and card board scale models helped to clarify the design! The slopes of the control unit was inwards making it difficult to read graphics. It was chin down in looks! I reversed the slope and added one more part to house the controls. Control cover and bottom of the unit were made darker! It started looking attractive! I was little worried of increase in the material. I drew the development to scale and could fit all the sheet metal parts in a standard 6' x 4' sheet! Though the boiler was made in small numbers it was important to pay attention to 'cost effectiveness'. Otherwise some value engineering at later stage could ruin the aesthetics of the whole unit.

*Value engineering is a potential threat to industrial design, as there is no value for looks in value engineering!*

The boiler had several connecting tubes, creating a chaotic situation. I found ISI standards which specified color codes for each tube or cable based on its function. I created a specific point or a 'Connecting- Bridge' where all connecting tubes and cables will be anchored. I also suggested a cover at the bottom of the boiler to give a smooth transition!

The boiler was well accepted by the company! But when I was called for presentation, no body from the Management was there! The development engineer said, 'this is a presentation to me! I will present it to the Management!' He wanted the credit for the project. My presence could have reduced his importance! Though the Management knew that IDC was designing, we lost an opportunity to present! Designers within the company continuously face this hierarchical problem! An engineer-boss will not allow the junior designers to present directly! That is the reason designers need more forums to talk about design. 'Design council for the Country can play an important role!

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