

Theme of the Month

“Resource Intensity & Recycled Inputs”

Introduction



We are pleased to release the 9th issue of Monthly Sustainability flyer in continuation.

First of all, let us all be proud of our achievement in **The Mahindra Way** journey wherein we have moved from stage 3 to stage 4 this year. Heartiest congratulations to all of us.

Our **theme based energy month** events got over last month successfully with tremendous participation from all.

Now we have started **Waste to Wealth month** from 18th Nov & we are sure that it will be another big success.

In this flyer, we will be learning about one of the most important topics : Resource intensity & recycled inputs.

We all know that all ie more than 200 Nations globally came together & have agreed on 17 common Sustainable Development Goals for 2015 to 2030. **The SD Goal no. 12 refers to the Responsible Consumption & Production.** Herein it is expected that production is achieved with efficient use of natural resources.

We are expected to achieve sustainable management ie improve productivity, reduce environmental impacts, reduce waste, green supply chain procurement.

In line with these expectations, our resource intensity & recycled inputs journey started in F 14 itself [much before SDGs were launched].This important aspect is mentored by Mr. R. Gokavi & led by Mr. U. Padhee.

The cross functional team under this guidance is mainly working on :

- Increasing the product yield at various stages by minimizing the wastage

- Increase the usage of recycled inputs [scrap, flashes etc...] & reduce the consumption of natural resources [pig iron, sponge iron etc...]
- Benchmarking / comparing our production processes & results with best in the class industry norms

The journey of this team has been very inspiring over last 3 years with lot of success stories. The team has taken ambitious targets for net 3 to 5 years.

These initiatives have a direct benefit to our business as it improves the production efficiency, reduces costs & improves bottom line.

This aspect is a direct linkage to our vision statement on the parameter of profitability & admiration.

While we are in the journey of doubling manufacturing outputs, we will be needing to expand our customer reach in various sectors of industries & geographies globally.

While the national & international norms are becoming more & more stringent on environmental & waste aspects - resource intensity efforts help us operate within these norms.

These efforts make us more competitive, learn lean manufacturing best practices.

In this flyer, you will find lot of success stories from our resource intensity team members.

Enjoy reading & do share your valuable feedback about this flyer with us.

- Mr. R.S. Rane
Business Excellence Cell



The Mahindra Way Cycle 8



It gives us immense pleasure to inform that we have been moved to Stage 4 from stage 3 in the Manufacturing Category in TMW Cycle 8 Assessment.



Heartiest congratulations to Mr. Chandrashekhar Sonavane, the catalyst team & all who made this happen. Congratulations to all HODs for their interest, support & guidance.



Resource intensity, a term which has always been the most essential objective for any successful manufacturing industry, is defined as the measure of the resources (e.g. Materials, energy and water) needed for the production or for the completion of a process. It is usually expressed as a ratio of materials used to value (expressed, for example, in money, mass, volume). It is determined by two factors: changes in the mix of materials used to produce individual goods and services, and the product composition of output. Recycling is a key component of modern waste reduction and is the third component of the "Reduce, Reuse and Recycle" waste hierarchy. **"Resource Intensity is all about "doing far more with far less."** We look for "transformational ways to intensify and achieve the same or better outcome using fewer resources."

Objectives of the team

- **To minimize the resource consumption helping depletion of natural resources by alternative inputs.**
- **To reduce wastage & conversion cost**
- **To enhance employee involvement (group study & learning)**
- **To improve upon all of the set standards. Improving yield directly impacts production costs, energy efficiency.**

- **The ability to obtain higher yields using the same amount of energy reduces energy intensity of process.**

We at MSSSPL started the journey to understand the process barriers and the scope available to

improve the set standards. This is happening through regular interaction with all shops. Our focus area in coming days is to involve the grass root people in interaction and discussion.

- Mr. R. Gokavi
Mentor



Team Members

Mr. R. Gokavi, Mr. U. Padhee, Mr. V. Prabhune, Mr. S. Gopinath, Mr. S. Sonavane, Mr. P. Shete, Mr. P. Gaikwad, Mr. B. Vaiude, Mr. R. Katkar, Mr. T. Gadgil, Mr. A. Sharma, Mr. S. Navalkar, Mr. S. Tambe, Mr. R. Bhoir

Journey of the team.....



The resource intensity journey started in 2014 with building a team consisting of people from various functions of plant.

At the outset the mission and vision statement were designed and documented which closely aligned with the MSSSPL'S vision, BSC and SDG with risk and opportunities. After this a road map with the detailed action plan was made focusing three major areas which are, increasing recycled input material in SMS (%), improving SMS liquid metal yield (%) and improving product yield (%).

To work on these areas a base line was made by taking last one-year data as an indicator to measure progress in improving resource intensity. To make these projects success, a target was fixed and an action plan made, identifying the improvement areas. Based on LCA items were selected for yield improvement by the efforts on "upstream" resource management and waste reduction aspects. More focus was given to efficiency in operation as :

- **Ratio of virgin materials to total material inputs in the production process.**
- **Ratio of actual to potential recycled materials**
- **Materials productivity – the economic output per unit of material input**

For competency enhancement of the team members, various activities were done which include **training on various guidelines, benchmarking with other steel industries, billing study, yield study of completed heats, alternative thinking on material intensity, emphasizing on local scrap to tackle**

volatility of price and

reduce GHG footprint. Along with these, various shop-wise activities were carried out such as **optimizing the continuous cast length of blooms to meet rolling and multiple length requirements, establishing the efficiency of split type hot-tops, scale loss study in chamber furnace comparing the same for oxy fuel and non-oxy fuel furnaces, and correcting the weight of ingot cast.**

A four-year comparison data between F14 to F17 shows the dedication and determination of this team towards the goal:

- **The use of various scraps has increased by almost 5%.**
- **The reduction in use of pig iron is about 2% and that of sponge iron is about 6%.**
- **Use of recycled inputs has gone up to about 70%.**
- **Liquid metal yield has gone up to about 92%**
- **Defects of various diameter rolled products has come down below 0.5%, internal soundness has decreased.**
- **Tower forging yield has gone up.**

With the changed scenario of the world, the ice has been broken by taking the sustainability initiatives that helped us rise to varied challenges and make great strides in the process in the area of material intensity. This is the beginning and there are lots to do in the time to come. We are certain that the path we chose is the right path for long term sustainable value creation for the business and all its stakeholders.

- Mr. Umakanta Padhee
Leader

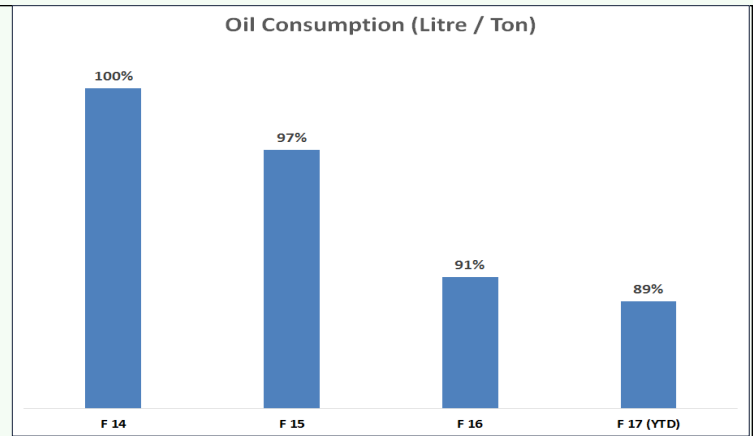
Reduction in Furnace Oil Consumption



The focus on reduction of furnace oil consumption is always a continuous task for all steel mills.

Apart from the cost, the impact on the oil resources and pollution on the environment are some of the major issues. So it is a never ending process. As a matter of fact, everybody is trying to save as much oil as possible. **We at Rolling Mill made a project to optimize the input lengths of Concast blooms.**

For higher sizes, the lengths were increased by 10-12%. This not only gave an increased production but also reduction in oil consumption. The adjacent graph is an indication of the gradual reduction of oil consumption:



- Mr. Suresh Gopinath : Member

Quiz time :

Which type of plastic is more dangerous to the environment?

1. PVC 2. HDPE 3. PS 4. PET

(Be the first one to SMS the answer @ 7720091891 & get a prize for the same.)



Special Thanks to

Mr. Bishal Sao

for converting the articles into the Story line.



SAE 1541 Success Story



In F16 the internal rejection in the finished rolled products of the grade SAE 1541 was almost 3%. This was not an acceptable

situation and it was targeted to reduce the internal rejection to below 2%. To do so, the existing practices were studied and modified. One such modification is to slowly cool the hot blooms cast in continuous casting process up to 24 hours in pile condition using insulating blankets before further processing. Also, after hot-rolling, the products are to be slow cooled by blanket cover.

After applying these modifications, the results obtained have been quite encouraging. **The internal rejection came down to below 1%**, hence giving better yield and optimizing the use of available resources.

- Mr. Rahul Katkar : Member

250 RCS Success Story



In one of the particular processing routes, we were supposed to provide both ends cut finished product to the customer. Earlier after rolling, the semis rolled to 250 RCS with both end cut had a length of 9 meters. As per QA after hot rolling, it was supposed to be cooled in the pit. We did not have the pit capacity to hold 9 meters so we used to shear cut the material into half. This process led to wastage of good material as the end shear cut was not acceptable to the customer and it had to be saw cut.

To avoid this wastage, we searched for alternative where the whole rolled piece could be accommodated and Kirti Furnace was the magic solution. Kirti Furnace has the capacity to hold the 9-meter-long hot rolled RCS, so after rolling they would be immediately transferred into this furnace.

This endeavor not only led to improved yield of product but also saved extra cutting time, energy required and also material handling was smoothed .

- Mr. Tushar Gadgil : Member

What is YEILD



Yield denotes the efficiency of a process by comparing the amount of output to the amount of input.

“Yield improvement ” covers the complete process chain within the steel industry. Improving yield directly impacts production costs, energy, time. At MSSSPL there are two process routes, namely INGOT casting & CONTINUOUS casting. For INGOT casting average yield is 80 to 87 % & for CC casting average yield is 90 to 95 %. Yield working is done for each heat considering customer’s length requirement & ingot size is defined. At MSSSPL we have one special team which exclusively works on yield improvement.

Objective:

- Monitoring and measurement of actual yield with planned yield.
- At step one, detailed analysis of cases where actual yield is beyond

the range of + / - 2 % is done on heat to heat basis and correction and counter measures are worked on for addressing the gap.

- Identify the projects for yield improvement at various process stages. To uphold these objectives, we have standard of engineering yield calculated for each process route (70 to 80 routes). This is derived from various losses and discards needed for various processes and products. This is part of the planning sheet (Route card) of each heat. The measurement of the yield is on the basis of dispatch weight of the cast / or finished good weight till they are shipped. The yield calculation is explained as below:

$$\text{Yield} = [\text{Finished weight (Dispatch weight)} + \text{Internal rejection}] / \text{Steel Melting Shop production quantity}.$$

- Mr. Rahul Bhoir : Member

Tower Forged Rings



To make our forged rings product more cost competitive, we concentrated towards the tower forged rings weight reduction. Despite having flash less forging, we had a brain storming discussion over the various possibilities feasible for weight reduction. Finally, we have identified that the parting allowance needed to separate the inner and outer ring by machining is not a product requirement, and can be minimised. Based upon the above identified area, modification in the design of placement of the inner and outer rings was carried out such that upon forging, these two pieces got separated automatically during finish machining without any extra parting machining.

This was a huge step towards enhancing the understanding of efficient way of tower forging, which increased yield along with reduction in raw material cost, conversion cost, transport cost, machining and lead time .

- Mr. Shankar Navalkar : Member

Customer Satisfaction



In earlier years the forging of heavier ingots was done after shearing them into two halves, forging into finished product and then end saw cutting. But one of our customers had an issue with the finished length, as it gave less number of multiples for cutting.

To cope up with this we explored ways to forge the ingot fully without shearing it. This helped in a very crucial way as the forging to finished product yielded a length in which higher multiples could be cut out, hence increasing the yield and satisfying the customer simultaneously.

- Mr. Prashant Shete : Member

Recycled Inputs



Usage of recycled material is one of the important pillars of resource intensity. MSSSPL, being a responsible & vigilant steel producer observed this as a prime responsibility.

In Steel Melting Shop (SMS) we are using scrap mix which consists of Pig Iron & direct reduced iron (DRI) along with other inputs like shredded & HMS (Heavy Melting Scrap) As a first step to increase recycled material, DRI is normally reduced to < 5 % of scrap mix & replaced by HMS

However continuous increase in prices of pig iron has forced us to rethink about curtailing % of pig iron to keep scrap cost in budget.

With reduced use of pig iron, we were skeptical about a situation where there would be an increase in the energy consumption at Electric Arc Furnace (EAF).

To make up for the carbon deficit in the scrap mix (due to reduced usage of pig iron) was fulfilled by usage of lump coke.

Initially there was practical problem of boiling in FIC with usage of lump cake, this was overcome by active participation of EAF & change preparation crew in SMS.

- Mr. Sudhanshu Tambe : Member