ASYN STEEL ENGINEERING

Leave Home Town
Dispatch Mountain

Success Story

Start up, Revamping and Training – Natanz Steel Company

With the aim to boost our hometown steel production and know-how achievement, ASE was involved in a project to cope with challenges in favor of better future. We hope that we have already taken a positive step for our country and a step near to excellence in steel industry. You can find a brief description as below.

Introduction

Natanz steel Company built its second Meltshop (SMP2) consisting of one 70T EAF, LF supplied by a Chinese company with one 4-Strands Billet Caster, manufactured in 1993 by CONCAST, and related utilities to make this company enable to produce its required grades of billet for its wire rod rolling mill. Due to contractual problems; Chinese supplier did not attend for commissioning and the owner, with the Help of ASE crew, made the first heat on April 2013.

Due to lots of problems, mainly coming from the time of project execution in Electrical and mechanical parts, SMP2 produced less than 30 heats during first 4 months of operation. In August 2013, ASE was awarded a contract for consultancy and engineering to make solutions for improvement in plant. Consequently ASE crew made an onsite investigation on Natanz SMP2 and prepared a wise project plan for improvement in logistics, equipment, and operational improvement in both long and short term categories. The main Projects and related challenges are enlisted as followed.

Projects and Challenges

- **DRI feeding system**: **Since there was no DRI feeding in the original design of plant; DRI was charged to the furnace by basket and this feeding caused several problems in the furnace. To solve this problem, a new DRI handling system was designed and divided to two projects of short and long term. The first phase was built in January 2014 and feeding was done to the 5th hole inside delta.**
- **Electrode breakage and Roof Arcing**: **Breakage decreased from 4 breakages in a day to a few in a month. This achievement was done by improvement on regulation system and also High voltage phase arrangement.**

ASYN STEEL ENGINEERING

Leave Home Town
Dispatch Mountain
Success Story

Besides; water air mist spray cooling system was implemented to decrease electrode consumption. Roof Arcing was also completely solved by changing insulation, connection and loops in the roof.

- **Dedusting system Revamp: Dedusting system functioning was too much out of local standard ranges. After several alerts; local authorities threatened to close the factory. By early February 2014 the problem was completely solved by revamp of Bag Filter, modification on EAF Elbow, and changing Lubrication system of Dedusting Ejector Fans.**

- **Logistics Improvement: The Meltshop crane duty has got a wide range of actions including Tundish and Casting floor support, Ladle and refractory area handling, EAF Fluxes and Carbon feeding. Therefore, the plant was facing lots of off-time delays on its operation, and below project was done for this improvement, mainly according to concept of implementation of buffering equipment to enable main process not to stop due to Crane delay:**
  - **Adding One 15T crane for material handling and maintenance**
  - **Implementation of second ladle car and in-line preheater for tapping ladle**
  - **Implementation of one tundish preheater in opposite side**

ASYN STEEL ENGINEERING

Leave Home Town
Dispatch Mountain
Success Story

- **Water treatment system problems: Lots of improvements, including below actions, was done for improvement of cooling water system:**
  - **Complete revamp of Cooling Tower Spray system**
  - **Implementation of dosing system and laboratory**
  - **Flexible changing in material and types to increase life and reliability**
  - **Implementation of Oil Skimmer**
  - **Increasing of Water Flow rate (future)**
- **CCM Improvement:**
  - **Improvement in oscillation damper**
  - **CCM curve readjustment**
  - **Implementation of Wire Feeding system into mould**

Training

Besides mentioned challenges; one of the main jobs of ASE crew was to train personnel specially to make them be able to produce qualified low carbon steel grades. Mainly training Subjects was:

- **How to make foamy slag**
- **Billet defects and solutions**
- **LF treatment**

ASYN STEEL ENGINEERING

Leave Home Town
Dispatch Mountain
Success Story

It is worth saying that Preventive Maintenance, spare part documentation, and drawing were prepared by ASE during its mission which shall implemented and purchased by Customer, which is vital for consistent operation. Also ASE Prepared PM list for equipment to prevent unforeseen maintenance and reduce power off time.

Achievement

Due to above mentioned efforts, step by step improvement started; which are described in below table:

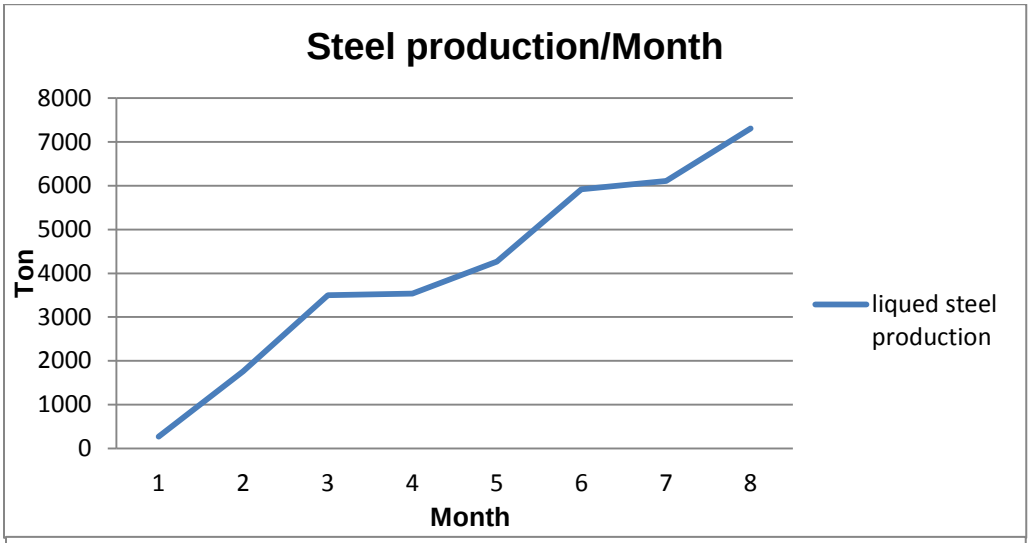
		Apr - July	Aug	Sep	Oct	Nov	Dec	Jan
Heats	Qty	32	60	59	66	96	106	126
Good Billet	Tone	2031	3500	3534	4264	5923	6111	7307
Low Carbon Grades	%	0%	0%	0%	0%	0%	15%	55%
5SP Grade	%	100%	100%	100%	100%	100%	85%	44%
Yield	%	85%	84%	85%	84%	82%	86%	85%
Scrap	%	100%	89%	75%	82%	55%	52%	63%
DRI	%	0%	11%	25%	18%	45%	48%	37%
energy EAF and LF	kWh/t	-	577	692	637	617	629	615
Electrode con. EAF	Kg/t	8	7.5	6.8	8	5	4.5	3.5
Electrode con. LF	Kg/t	1.1	1.1	1	0.6	1	0.8	0.8
Ferro Alloy	Kg/t	11.9	15.5	14.6	14.8	14	20.8	13
lime	Kg/t	46.2	74.5	60.9	60.5	59.6	70.6	77.7
Carbon	Kg/t	48	61	39	48	29	25	36
O2	Nm3/t	45	37.3	21	44	36.1	32.9	21.7
Refractory	Kg/t	26.6	15.2	36.3	25.6	20.9	18.5	18.1

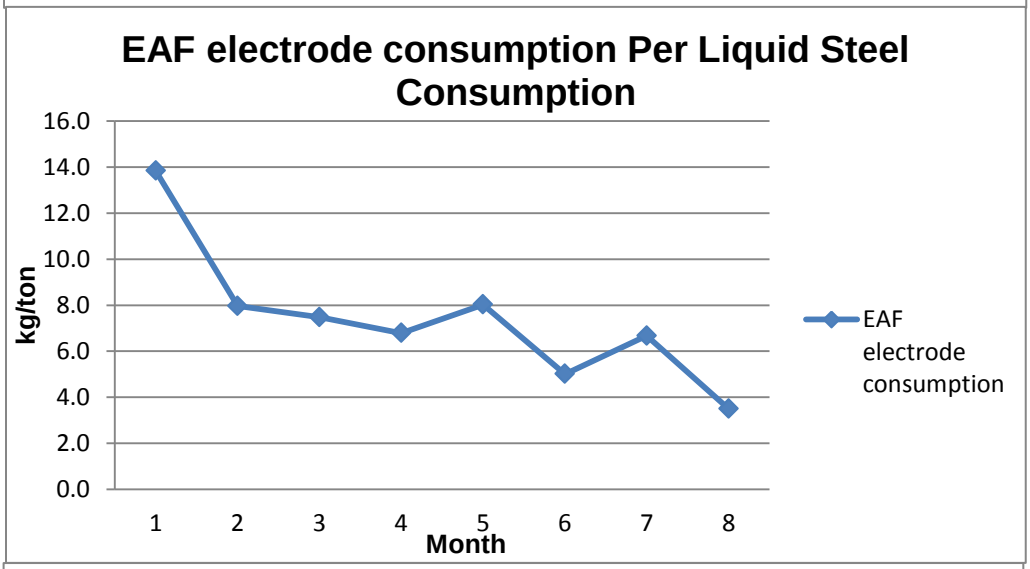
As an achievement the company produced different wire grades in Low carbon like USD7, RST and high carbon like C62.

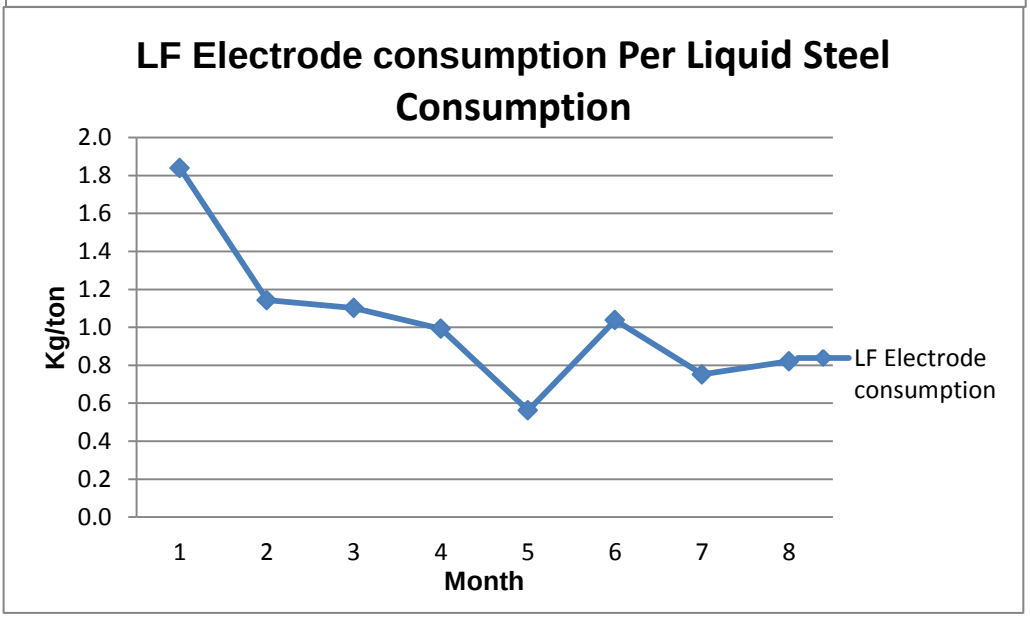
ASYN STEEL ENGINEERING

Leave Home Town
Dispatch Mountain

Success Story







ASYN STEEL ENGINEERING

Leave Home Town
Dispatch Mountain
Success Story

To improve NATANZ SMP2 in near future, lots of Jobs are definitely remained for future step by step improvement which was started by ASE and design is finished and delivered now .These steps are briefly discussed below:

- **Design and installation of natural gas valve stand to have burner beside oxygen lance.**
- **Changing Steel Box to cupper box injection**
- **Implementation of DRI storage bin and truck loading system (foundation has done)**
- **Producing low carbon grade; one second hand VD was revamped, missed equipment was engineered, and purchasing order issued. Foundation has also done which shall be completed to produce low carbon steel wire in future.**