SFSA CASTEEL REPORTER

Steel Founders' Society of America

a publication serving SFSA steel casting industry Members

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Casteel Commentary

The Casteel Commentary considers the issue of Smart Manufacturing and the use of the Internet of Things, IoT. We need to let the next generation of managers and professionals add sensors, data connections and automated controls to modernize and optimize our production systems. The tools are already implemented in our personal lives and our professional activities. It is a useful investment to pursue the networking opportunities in our plants to gain the advantages for our companies.

SFSA Fall Leadership Conference

There is still time to register for the SFSA Fall Leadership Meeting being held on September 12-15 at the Loews Hotel in Washington, D.C. We invite you to join other industry leaders to experience a great program and networking opportunities in our nation's capital.

Update: Congressman Bill Huizenga (R-MI) will lead the business session on Tuesday, September 15 with a presentation to SFSA members. This year's business sessions will also include:

- Richard Brandt, Iacocca Institute-Lehigh University - Globalization Going Backward
- Joe Trauger, National Association of Manufacturers - Manufacturing Issues - Workforce Development, Lobbying, Healthcare
- John Anton, IHS Global - Steel Markets Update
- Ron Lorentzen, International Trade Administration - Manufacturing Trade Issues
- Max Schumacher, German Foundry Association - German Foundry Business Climate and Trends
- Raymond Monroe, Steel Founders' Society of America - 2016 SFSA Market Forecast

Meeting Schedule:

Saturday September 12

8am	Executive Committee Meeting
9am	Executive Committee Spouse Breakfast
1pm	Arlington National Cemetery Tour
6:30pm	Welcome Reception

Sunday September 13

8am	Board of Directors Meeting
9am	Board of Directors Spouse Breakfast
1pm	Trolley Tour – Washington
6:30pm	Historical & Architecture Tour Dinner

Monday September 14

8am	Business Session
9am	Spouse Breakfast
1:30pm	Mount Vernon & Distillery Tour
6:30pm	Reception & Dinner

Tuesday September 15

8am	Business Session
9am	Spouse Breakfast
6:30pm	Reception

HR & Safety Group Meeting

Please save the date for the next HR & Safety Group meeting, which will be held in Kansas City, MO on October 20-21, 2015. The meeting will include a tour of Bradken's Atchison and St. Joseph facilities. Additional information will be e-mailed soon. For questions or to RSVP, contact Ryan Moore at rmoore@sfsa.org.

Research Review

The annual SFSA Research Review is right around the corner on July 27-29 in Chicago. The Review covers the latest steel casting research, and is your opportunity to interact with the researchers and provide industry steering. The event features both Carbon & Low Alloy and High Alloy topics. With strong support from Federal programs, SFSA manages a large portfolio of R&D. Through industry support, these projects will enable the growth of our industry on out into the future. To RSVP, please contact David Poweleit at poweleit@sfsa.org.

Heavy Section and Welding T&O Meetings

The SFSA Welding (Eastern Division) T&O and Heavy Section Product Group (HSPG) meetings that will be held on Thursday, August 20th and Friday, August 21st near Pittsburgh, PA. Thursday morning will be the HSPG meeting on the featured topic of segregation. Thursday afternoon will be for the traditional "Eastern Division" T&O meeting, which will feature topics on welding. In addition to the two meetings, we will take a tour of Whemco Steel Castings on Friday morning. Additional details can be found online at https://sfsa.org/meetings/eastern15.php. To RSVP, please contact David Poweleit at poweleit@sfsa.org.

Future Leaders and Southern Division Meetings

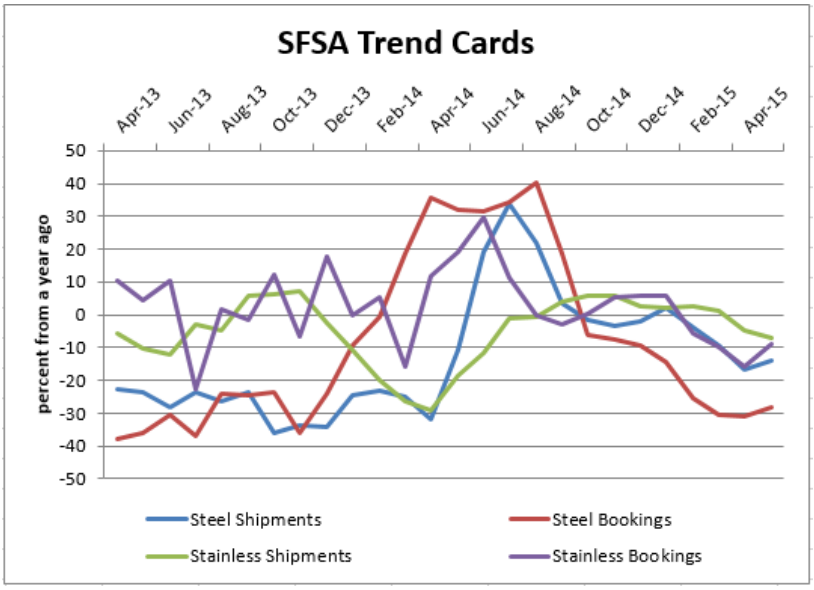
Please save that date for the upcoming Future Leaders and Southern Division meetings on October 7-9. The meeting will feature a tour of American Foundry Group (AFG) near Tulsa, OK.

National Technical & Operating Conference

The 69th SFSA T&O Conference will be held at the Drake Hotel in Chicago, December 10-12, with a member workshop on the afternoon of Wednesday December 9. The T&O Committee, along with SFSA staff are working hard to assemble a program of papers and presentations that is sure to be of value in your plant. Mark your calendar. Additional information will be sent out to SFSA members when it is available.

Cast Preforms

Many forgings have long lead times and high costs because the stock is unavailable or is poorly shaped to produce the final forging. A cast preform allows material to be positioned to get the forging shape and properties efficiently. This project will determine the forging reductions for cast steel preforms to realize the required properties of a forging. Within the next few months, SFSA anticipates funding through Defense Logistics Agency Forging ManTech and the project will be supported by University of Alabama at Birmingham. If you would like to propose candidate parts for this project, please contact David Poweleit at poweleit@sfsa.org.



Questionnaire/Effort from EPA Region 5

EPA has developed an interest in EAF dust characterization from steel foundries. EAF dust from mini-mills is defined as hazardous and must be treated and permitted as a hazardous waste without regard

to is actual character. Steel foundry EAF dust is not defined as hazardous and most foundries that have tested are able to demonstrate that it is not a hazardous waste. It is also common to modify the melting and collection process to produce a waste that is not hazardous.

This ability to show the EAF dust as non-hazardous does require that the plant re-test if there is a significant change in the feedstock or process. EPA is sensitive to checking if the steel casting producer has maintained and tested to make sure that their EAF dust is non-hazardous. Their interest is shown in a questionnaire that they are currently circulating for plants to complete:

EPA Region V Information Request

1) Describe the nature of the steel casting operations at the facility, including whether the casting at the facility is ferrous or non-ferrous or both.

2) Identify all electric arc furnace(s) (EAF) located at the facility.

3) Describe each dust collector associated with an EAF at the facility.

4) Describe the nature of the waste generated by each EAF, including whether the waste was hazardous of non-hazardous, and how it has been handled from January 1, 1990 through April 30, 2015.

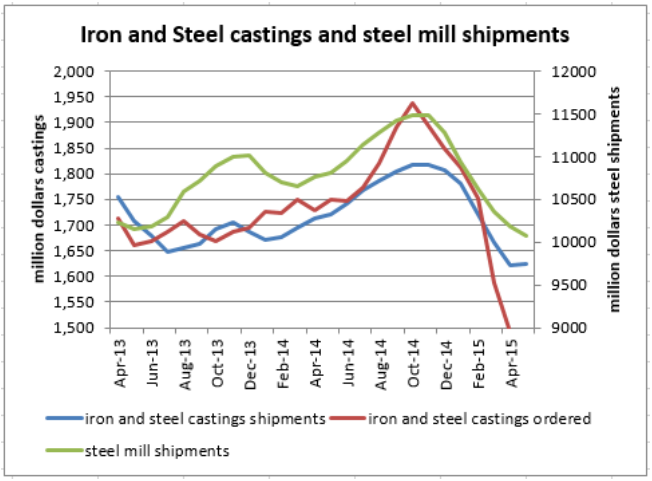
5) Provide all sampling results and analytical data for the waste generated from each EAF.

6) For each shipment of waste generated from an EAF at the facility from January 1, 1990 through April 30, 2015, identify the name and address of the location to which the shipment was sent and how it was handled and/or ultimately disposed.

7) Provide the following notarized certification by a responsible corporate officer or by a general partner or the proprietor:

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision according to a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

AFS has been alert to this activity and sent SFSA this alert thanks to Jeff Hannapel in the AFS DC office.



Market News

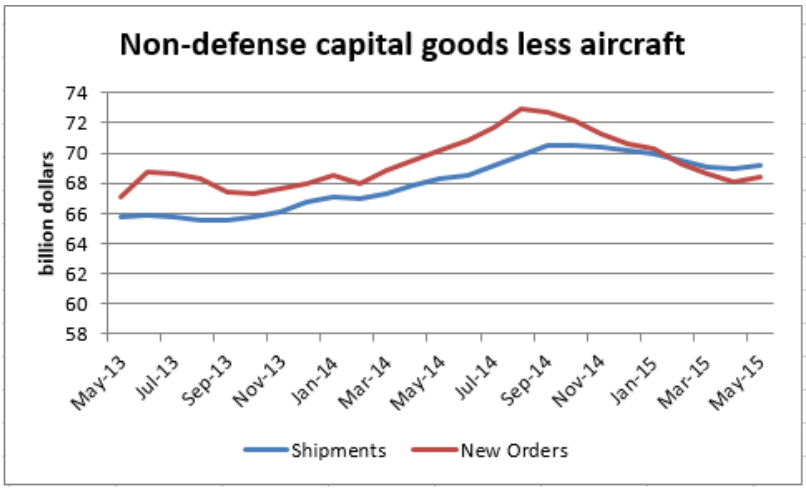
Since the first of the year based on the SFSA trend cards, steel casting shipments are down and in March they are down 10%. Stainless shipments in March are stable but bookings show that the trend in the future is down.

The strongest correlation of production of steel castings is with steel mill production. As reported each week on our website, steel production is off about 10% this year compared to last year. This would suggest that steel casting production will be down 20% from a poor showing in 2014.

In terms of steel casting annual sales instead of production, the total sales are closely correlated with the WTI price of oil and the price of copper. The price of oil dropped dramatically at the end of 2014 from levels around $100 a barrel a year ago to $51 a barrel now. This would suggest a drop in sales of over 35%. The price of copper has dropped from over $3 a pound to around $2.5 a pound. This suggests a drop of around 10% in the sales of steel castings.

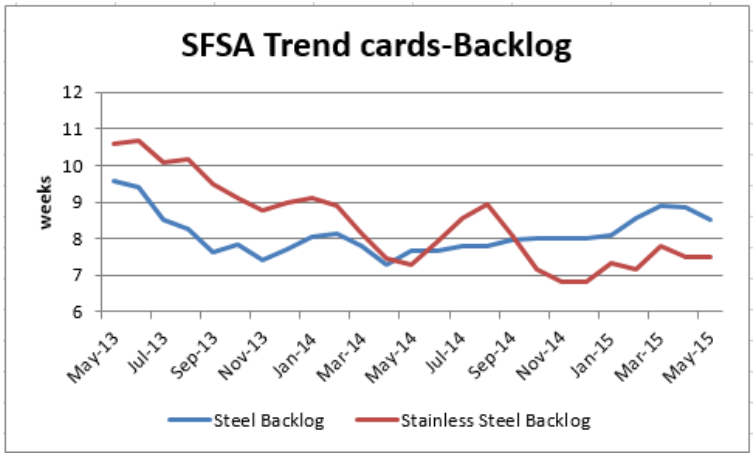
These drops in correlated factors and prices in our downstream markets that create the demand suggest that our business levels for the balance of 2015 should continue to decline. Given the current

high valuations in the equity markets and the uncertainty in the international financial markets, we could see a sharp decline in equity values and a rising interest rate. This adjustment may prove necessary before rational investments in capital equipment are possible. Without a stable financial and business environment, investments in infrastructure and equipment will be slow dampening the demand for equipment, commodities and of course steel castings.



The slowdown in the demand for capital goods is seen in the new orders and shipments of capital equipment excluding aircraft. Not only are the trends pointed to a contraction, the new orders have fallen below the shipments suggesting ongoing contraction in the demand for capital goods. When the drop in demand for capital goods and the decline in prices for oil and copper are considered, demand for steel castings is likely to be down for at least the balance of 2015.

The sales of steel mill products has been in decline since late 2014 and so have the sales of iron and steel castings reported by the Department of Commerce. Steel casting sales like production is down 10%. Iron and steel casting sales in the same period declined more modestly, about 4% likely due to the continued strength of demand for iron castings tied to automotive demand.



Since March 2015, steel production reported by AISI weekly shows a slow market continuing about 10% below 2014, which was below 2013.

Backlog has shown a modest recovery but it is not clear why it is increasing while general production levels and new orders are down. This may reflect an ongoing effort to manage the size of the workforce to avoid losing money in a slowing economy.

Casteel Commentary

The development of Internet technology and the rapid fall in price and rise in capability of computational power and data storage has fundamentally changed the way we do business. We communicate by email, not as much by phone and rarely by mail. We check on our news and contacts routinely so much that checking email is like an addiction. Smart phones let us keep up and respond to questions or issues everywhere and all the time.

With this tremendous improvement in information technology, our office functions have changed but…

We have not yet seen the dramatic changes coming in our plants. We have not seen the application of Internet and wireless technology with affordable sensors and cameras used to monitor and control our manufacturing processes. We have not yet seen our plant wired up and integrated so we can check on each operation as easily as we can check the weather.

I attended a meeting of the Smart Manufacturing Leadership Coalition. Their mission is to make manufacturing “smart”. What does that mean? They define it as the ability to solve current and future problems at the speed of business. They intend that these new smart technologies will allow us to provide systemic rather than point solutions to our manufacturing enterprise. This includes low cost

sensors and the integration of our programmable controllers and systems into a digital space, the use of this big data to provide real time control to optimize our product and efficiency, and then to use modeling to design and improve our products.

One usable insight I thought was the developing Internet of Things, IoT. You may have seen references to IoT lately; clearly it is a current buzzword. I did not understand the concept but they had a presenter, Richard Mark Soley, present on the effort. His organization website has a section on IoT; http://www.omg.org/hot-topics/iot-standards.htm.

If we look at not our office but at our plant, we can recognize that we have only slowly and partially adopted the new information or Internet technology. We may have our cameras available on a network, we may have some newer controllers, we may even have at our spectrograph or test lab automated data entry for certifications but we do not yet have our equipment controls integrated into a data system that is real time. We have not identified the low cost sensors and their potential in monitoring and controlling our processes.

One example presented was the control of a steam reformer for temperature. If the temperature gets too high it damages the life of the equipment so with the typical variation of temperature seen in the furnace, the set point is low enough to present damage. The controls are traditional PLC controls of burners based on limited thermocouples and operational experience. The company installed infrared cameras in critical locations and developed a control system that allowed them to adjust the burners locally to avoid hot spots or cold spots. This reduced the variation significantly in the furnace. The reduced variation and the ability to limit temperature excursions that were high has allowed them to increase the operating set point and increase production and yield.

Those of us, like me, who have experience (read "are older"), still have the intuitions that sensors are expensive and controls are simple set point devices. We need to allow the next generation to put our plant on an internal networked system that can be “smart” and allow us to improve our operations and efficiencies.

We see this already happen with interns. When we give an intern a project, often it involves the collection of data. They look at our existing system to manually collect and store data and are exasperated. Their first step is often to automate collect the data at the point of data generation to allow fewer errors and less effort. This data is then available electronically so it can be used for analysis and control.

We need to empower this new generation, (read "younger"), to use the tools they are comfortable with to improve and make our plant “smart”.

Raymond

STEEL FOUNDERS' SOCIETY OF AMERICA
BUSINESS REPORT

SFSA Trend Cards (%-12 mos. Ago)	12 Mo Avg	3 Mo Avg	May	April	March
Carbon & Low Alloy					
Shipments	-0.8	-17.7	-24.8	-17.0	-11.3
Bookings	-5.4	-28.7	-30.2	-31.0	-25.0
Backlog (wks)	8.2	8.3	8.0	8.0	9.0
High Alloy					
Shipments	-1.0	-11.5	-20.0	-10.0	-4.5
Bookings	-4.9	-19.2	-40.0	-7.5	-10.0
Backlog (wks)	7.6	7.6	7.8	7.0	8.0
Department of Commerce Census Data					
Iron & Steel Foundries (million $)					
Shipments	1,747.5	1,629.7	1,640	1,605	1,644
New Orders	1,751.3	1,464.7	1,523	1,523	1,348
Inventories	2,188.3	1,981.7	1,986	1,978	1,981
Nondefense Capital Goods (billion $)					
Shipments	79.4	79.3	79.3	79.8	78.9
New Orders	85.6	78.3	74.3	79.5	81.1
Inventories	182.8	176.9	176.2	177.3	177.2
Nondefense Capital Goods less Aircraft (billion $)					
Shipments	69.8	69.3	69.5	69.3	69.1
New Orders	70.7	68.5	68.6	68.3	68.5
Inventories	122.3	121.7	121.5	121.8	121.7
Inventory/Orders		1.8	1.77	1.78	1.78
Inventory/Shipments		1.8	1.75	1.76	1.76
Orders/Shipments		1.0	0.99	0.99	0.99
American Iron and Steel Institute					
Raw Steel Shipments (million net tons)	7.9	7.2	7.2	7.1	7.3