



# 1992 PRESIDENT

## FRANK A. HULTGREN • IRON & STEEL SOCIETY



Mini-mills experienced explosive growth in size and importance during the 1980s, permanently altering the landscape of the domestic steel industry. Dr. Frank A. Hultgren, who will become President of the Iron & Steel Society this month, is a reflection of that new landscape. A senior staff engineer for the Minnesota Division of North Star Steel Company, now the eighth largest domestic steelmaker, he is the first ISS President to come from the mini-mill wing of the industry.

Dr. Hultgren has a bachelor's degree in metallurgy and a doctorate from Case Institute of Technology as well as a master's degree from the University of Michigan. He was a Fulbright scholar to Germany and did postdoctoral work in solid-state physics at the Technical University of Aachen.

Frank is currently involved in electric arc furnace steelmaking and product development at North Star, which he joined in 1988. He has also worked in physical metallurgy, metal physics, processing and properties, and continuous casting research. Over 20 publications and three patents have been credited to him.

A member of the Society since its inception in 1974, Frank served as chairman of the Society's Mechanical Working and Steel Processing Division

in 1989 and has been on the Board of Directors since 1987. He has been a member of the Ferrous Metallurgy Grant Program Committee since its creation, and serves on numerous standing committees.

Frank resides in Lakeville, MN, and is the father of three children. His oldest child is Diana, who is a junior majoring in English and communications at Kent State. Erik, his middle child, hopes to attend UCLA to study music. His youngest son, Gunnar, attends Berkshire High School in Burton, OH.

*I&SM* visited with Frank at his office on a surprisingly warm January day to provide him with an opportunity to express his views on the industry and the role the Society can play.

***I&SM:*** What concerns do you have about the industry?

**HULTGREN:** The demographic hole in the steel industry concerns me. If you plot the number of people in the U.S. steel industry by their age, you find that there is a hole on the 30- to 40-year-old part of the curve. If you take a look at the Japanese, it's the same game. No workers. No young people. Nobody wants to get dirty. The demographics for the European steel industry are essentially the same way. We've got to keep our 90 million tons a year of domestic steel production going. Somebody's got to do that.

***I&SM:*** How can the Society help to plug that hole?

**HULTGREN:** Look at the things that we are doing, that we have tried to do, that we have done. Look at AIME with its Transformations educational package for middle schoolers. Start early, start in junior high to try to get the kids interested in science and technology.

Then we have the University Relations effort with Bob Bouman and the video they developed to take to freshmen and sophomores in universities and colleges and try to get them interested in science, technology and the

industry. They can't all go out and make chips, whether they be potato chips, computer chips or whatever. Somebody has got to come here [steel industry].

That's one of the reasons the Ferrous Metallurgy Grant Program was created. We needed a vehicle to attract the attention of young engineering students.

***I&SM:*** You've been involved with the Ferrous Metallurgy Grant Program from the beginning. Do you believe that it should be expanded?

**HULTGREN:** I do, because I see the effectiveness of it. We, as a Society, cannot hire kids. All we can do is get them ready, get them interested, get them to look at the industry. The programs in Toronto, Columbus, the one at Colorado, they're dynamite. They really are bringing young people into working with the metallurgy of ferrous systems. The physical metallurgy of ferrous systems contains every transformation known to man. I've been in this business for 26 years and not all of the secrets have been revealed to me yet. There's still some out there. Thermochemistry of steelmaking – God does this. We just try to describe it.

***I&SM:*** Do you think the Society is ever going to decide to branch out and look beyond metallurgical graduates when it comes to the scholarships and ferrous metallurgy grants and so forth?

**HULTGREN:** When I was running research groups I hired every discipline in science and technology. I didn't care.

It is nice to get a metallurgist, but hardly anyone teaches metallurgy anymore. Steelmaking – who teaches steelmaking? We're hurting. All these kids have degrees in materials science. When you ask, 'What do you know about steelmaking?' They'll say, 'Well, we covered that in October.'

If you look at the kids that Professor Argyropoulos had in the Ferrous Met Grant Program at the University of Toronto, I don't think there



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was a metallurgist in the group. There may have been one. The rest were mechanicals and some other technical disciplines. But, that is part of the point of the exercise.

That is what we can do with the Ferrous Met Grant system. You can't just go slap it into every college and university in the U.S. because you're got to go where the ducks are. But it really comes down to the point that when you talk to college engineers, you're talking to the whole spectrum of people who come in to run a company, a process.

**I&SM:** The Iron & Steel Society is made up of process managers – not metallurgists, mechanical engineers or electrical engineers. Shouldn't we expand ISS beyond metallurgy?

**HULTGREN:** Yes, absolutely. Mechanicals, electricals, chemical engineers, whatever they are. ISS is not – it can't be – an organization of metallurgists. The Society is involved in the whole business. It ranges from the air that we breathe, to the scrap, to everything that we do to keep yields up, costs down while being good citizens. 'Process managers' is an excellent description.

**I&SM:** What can the ISS do to help those people already working in the industry?

**HULTGREN:** We have to help people get smarter, more efficient and get their costs down. That's where I see the Society functioning. We do a hell of a job in a lot of things, continuing education, advanced technology of symposiums – all of these things that we do to upgrade intelligence. The best thing that we can do, and the thing that we do best, is getting people to be more effective. We are good. But, we could be better.

I would like to put out a request to our membership for ideas on how we can get through to the vast bulk of steelworkers and help make them smarter, better educated technically, in order to get quality up and keep costs

down and make us more efficient.

We, as officers of ISS, don't have all the answers. But someone out there has some bright ideas. I would ask them to think about it. How can the ISS better function to serve the industry?

**I&SM:** Are you talking about, for example, a textbook that you could distribute to your troops?

**HULTGREN:** That's one example. Something like our safety manuals, things that we get from our suppliers. Very simple, but with a message transference.

Somehow the people on the shop floor have to learn about steelmaking, and this is a job for us, the Society. Each of the different employee talents that the industry uses has an immediate application to some small part of the process. Somehow they have to learn about the entire business. I'm interested in examining ways that we can do this. I cannot believe that all of the farm boys in the mini-mills or the folks in integrated mills understand steelmaking.

But, if we had the materials, if we had a way to communicate this magic that we do...

**I&SM:** Please elaborate.

**HULTGREN:** Let me give you an example of the ignorance. Stupidity is horrible, ignorance is not bad. It just means that there's a field that needs to be plowed. An electric furnace is a horribly stratified bath of iron/steel. It can be hotter than hell under the electrodes and down on the bottom it's cold. You have various states of oxidation or deoxidation. Temperatures vary. Big chunks of stuff don't melt right away. You end up with goofy conditions.

At some point in time, in the course of almost every heat, an overoxidized chunk of the bath comes in contact with an unoxidized portion. All hell breaks loose and you end up generating CO. The bath churns. The guys on the floor are petrified of this thing. They don't understand what it is. It's a mystery.

You sit them down and say, "Now look guys, this is what happens. You've got a lot of oxygen over here, you've got a lot of carbon over here. They come together, you get a boil, the bath churns and carries on and all you're doing is accelerating this boil when you stick the oxygen lance in there.

Nowhere can I find a simple way for these people to understand that. When you get into this magical world of thermodynamics and Gibbs' free energies they're lost. They don't know what you're talking about. A lot of the people in our industry are not college graduates. They're high school people. We have to find a way for a reasonably intelligent, nontechnical person to understand steelmaking because they are the people making today's steel.

**I&SM:** So the need for training manuals fits into that category of service to the industry? We are ultimately serving our members because it's our members who these people work for?

**HULTGREN:** Yes. In the more global concept it's the industry that we serve. Our members are an elite group of that industry.

Our members should be smart enough to know what to do if we can supply them with the materials.

**I&SM:** Let's swing this conversation and talk about you. How do you justify your membership in ISS?

**HULTGREN:** Knowledge, if you will, in every phase of iron and steelmaking. As you know, if you've been in this business any length of time the stuff gets in your blood. I can stand up there in the melt shop and watch heats tap all day long. I love it. I'm sure that if I went out there and made potato chips I could make more money than I'm making now. I just happen to like what I do for a living. I learn. I constantly learn through my membership in the ISS more and more about our business, our product, every phase of it.



# YEAR PRESIDENT

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The information is there if you choose to seek it. We spread the salad bar of information. All you have to do is pick and choose and look. It's there. And we do a terrific job of it. We really do. I've learned continuously from my friends, the papers, and books.

And, I know you've heard this from every President, when you get to the point where you really get an overview of the Society you find that it is really member run. And it is the dedicated, terrific people that make it go. It's wonderful. *I&SM*