ADVANCING THE TECHNICAL DEVELOPMENT, PRODUCTION, PROCESSING AND APPLICATION OF IRON AND STEEL

AIST Industry – University Roundtable
Monday, May 5, 2008, Noon – 2 p.m.
David L. Lawrence Convention Center, Room 333

Questions: Industry to University Professors

1. *How can the universities improve the number of students recruited into the steel industry?*
   - We need to expose students to the level or technology that exists in our industry today. There is also strong up-side potential for career advancement given our pending level or attrition.
   - Offer exposure through classroom panels and exercises.
   - I think a better question is what is the incentive for a university to recruit students into the steel industry? Universities educate students and equip them to work in industry or go to graduate school. What industry the students are employed is based on the recruiting activities of the industry and the perception students have of that industry, stability, future growth, excitement, research, summer jobs, etc. The professors will recruit into the industries that are supporting their research and actively involved on their campus.
   - Here it is assumed that the term "improved" means "increase." In addition to maintaining ferrous metallurgy as part of the undergraduate curriculum, universities can provide multiple different opportunities for steel companies to share the exciting aspects of "new steel" with students. This can be done in various ways. Each semester we have a career fair at the start of the semester where company representatives (often our graduates) man a booth and answer questions for potential graduates. We have an undergraduate materials club that invites speakers to noontime lunch meetings where typically pizza is served and companies are provided the opportunity to make presentations on some aspect of their business. Typically the companies cover the cost of the pizza. The best presentations are those that highlight new technological innovations, either in steel making or product development. These should be well-done (i.e. presented by an energetic outstanding speaker) and not just a "sales-pitch." In the recen

2. *What can companies do to help in this effort?*
   - Are there any particular forums in existence or opportunities to develop such forums wherein the industry can paint a realistic picture of opportunities in the industry?
   - Plant tours, internships, joint project work and campus partnerships will help.
   - Be available to collaborate and partner with academic units. Financial partnerships can help produce win-win situations.
   - Make sure that you are involved with the departments where you want more recruitments (example send engineers to give technical seminars). Do more than have only human resources industry people talking wiht career placement university representatives.
   - Companies can pursue several options for increasing the visibility of the steel industry in universities. Options include funding endowed professorships (e.g. the new Nucor professorships at UMR and South Dakota School of Mines), funding scholarships (at all levels, not just the junior year), participating in direct funded research programs at universities, working on government initiatives (e.g. as was done with the AISI/DOE ATP program) to expand funding opportunities for faculty to pursue research in ferrous metallurgy and other related activities.
   - Companies need to develop a strategy to interact with universities on many different fronts and maintain continuity in their interactions. They need to develop a continued presence on campus.

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- Recently, with many companies changing their names as a result of consolidation, instant name recognition of traditional companies by students (and faculty not closely involved with the steel industry) has been lost. In fact just last week I had a faculty member i

3. *What is the most common feedback you hear from students regarding both positive and negative experiences with internships?*
   - What are the positives and negatives about internships? What should the industry seek to develop in an internship program and what should it avoid?
   - They did not know I was coming and were not ready for me.
   - I did not have meaningful work to do.
   - Positive - Meaningful learning experiences; mentorship and continued affiliation when back on campus. Negative - Absence of one, two or all three of the areas listed above.
   - Most common positive: 1) learned things that school can never teach - personal relationships, safety, business, management, etc., 2) Enjoyed making money, 3) I now know that I do or don't want to work in that industry or for that company
   - Most common negatives: 1) Not enough direction, 2) Did not feel like I contributed.
   - For students nearing graduation, the primary negative feedback relates to students who were hired primary as technicians to fill holes for the summer where they did not receive projects with some responsibility.
   - Positive experiences seem to center around those student assignments where they were given a project or some aspect of a project and had the opportunity to learn what they might be doing in a permanent position. In general these also require a deliverable (e.g. report) for the company at the end of the internship

4. *What are the most important drivers for students selecting companies?*
   - Responsibilities, tasks, scope of work, skills necessary, working conditions, size of organization, corporate culture, growth prospects, location, financial condition, colleagues and supervisor, salary and salary reviews, training and development opportunities
   - Career growth opportunity, location of assignment, market-competitive compensation package
   - Summer/Coop - is housing provided
   - Permanent - More important typically than pay is whether or not the student feels they have a future with the company and that the company is exciting and growing and has a future. They look a lot to the managers and engineers they meet during the interview. The interview is just as much of the company for the student as the student is being interviewed by the company.
   - The most important factors which affect decisions include, location, interest in the assignment, and perceived opportunities for advancement. It should be noted that all students are different and each has a different primary criteria for ultimately making the decision.

5. *How much does pay fit into their equation?*
   - What is the best way to get the pay message out to students?
   - It's important but quality of work-life is showing up more and more when students consider a job opportunity.
   - Typically not the lone deciding factor, but often a critical component of the students' decision-making.
   - Pay is important but in most cases is not the most important variable. Most students take the job they think they will like the most, in the best location with the best management team. Pay is important but is not the driving force.
   - Pay is important; students expect to receive a “competitive” offer. However, the primary important point here is that the steel industry must be cost competitive with all other

industries. If the steel industry were perceived by students to always offer at the low end of the scale, then they will not be successful with future hires.

6. *How much does location fit into their equation?*
   - Big time.
   - Depends on the students; many of the Millenial generation students prefer to be closer to their families.
   - It is important but typically not the driving force. There are those students that say they will only take a job in a certain city. But they are rare.

7. *Does your university offer any classes or program specific to the industry whereas students are introduced to the steel industry?*
   - Yes - several courses in both mechanical engineering and in metallurgical engineering introduce the steel industry
   - Yes we offer classes that emphasize ferrous metallurgy. The existence of our steel research center which also supports undergraduate students and education (e.g. sponsors senior design projects, hires undergraduate research assistants, etc) provides daily reinforcement to students of ferrous metallurgy in their educational program.

Questions: Industry to University Career Professionals

1. *What have you found to be successful/not so successful in helping match needs and people?*
   - We don't match students and positions-we make them aware of opportunities and coach them but it is up to them to get the interview and job.
   - Contact with senior management during the selection process.
   - Be open and honest about your opportunities. Make sure what students are hearing about your organization when they first meet you is what they will see on the job.
   - Companies are wise to start with the career centers and avail themselves of the services provided. There is less success and legal issues to consider when circumventing career centers.

2. *What steps can you take to ensure students are award of opportunities in the steel industry?*
   - Having these companies be more of a presence on campus and let students know of all the different ways they can use their degrees in the industry. Companies can come to job fairs, come to networking events, etc.
   - We can post jobs and host events for you on campus. I strongly encourage a presence at job fairs, doing on campus interviews, attending networking events, meeting with student groups, etc. Additionally, you need to look at recruiting similar to sales. You rarely make one appearance and close a big sale. It is about building relationships and recognition over time.
   - Provide opportunities for companies to maximize interaction and brand themselves to students.

3. *Do you find that companies in this industry are making a presence with the student body early in the engineering program such as their freshman year?*
   - Not that I am aware of.
   - Generally not.
   - Yes, things are happening earlier and earlier. It is a must to have internships and/or co-op's at your company. If you start trying to recruit students when they are seniors you are way behind.
   - Yes! Continuing exposure on campus is the key to success!

Questions: University Professors to Industry

1. *How many metallurgy/materials engineers does your company hire per year?*
   - Five to 15
   - SMS Metallurgy, which comprises SMS Demag and SMS Meer hired 520 new employees in 2007, approximately 80% of them engineers of all disciplines and we are planning a further 700 new employees in 2008.
   - Approximately five

2. *What topics in ferrous metallurgy, with respect to their relevance to engineering activities in your company, are most important?*
   - We need a good understanding of mechanical properties derived from the combination of metal chemistry, processing and heat treating.
   - The correlation between equipment and control design parameters and operating practices.
   - Electrical steel (3% silicon) metallurgy. Electric furnace and refining metallurgy.

3. *What areas of expertise/knowledge do you find specifically lacking among new graduates entering the field?*
   - Common sense approach - general business management skills - understanding of how engineering knowledge translates into process and productivity improvements.
   - Until recently there was a lack of practical experience in equipment design, manufacturing and operating practices. This is being addressed with the development of internships and co-op's.
   - Metallurgical understanding of electrical steel.

4. *In what ways has university education improved over the last 5 to 10 years, in the area of metallurgy or ferrous metallurgy in particular?*
   - The development of internships and co-op's provides a bridge between academia and the steel industry.
   - To the contrary, most school have gone away from a dedicated metallurical program.

5. *What impact, if any, has the "high tech classroom" had on the skills of graduates in the field?*
   - Recent graduates are much more skilled in the current engineering tool box that is required for equipment design and manufacture such as 3D design.
   - It has helped them prepare and present information in an efficient manner.

6. *Are there any important new technologies or applications in the field of ferrous metals that university programs have failed to include?*
   - Electrical steel is an old technology/application that most university have failed to include in their programs.

7. *How often do you think industrial input should be gathered and utilized to adapt existing university coursework?*
   - Every 3 years at minimum.
   - At least every 5 years.
   - At least annually. Business and technology changes rapidly. The Universities need to keep pace.

8. *What roles should industry play in the implementation of undergraduate curricula and otherwise educating students in the field of ferrous metallurgy?*
   - How to examine and improve a process in general. Mechanical properties that derive from a combination of chemestry, processing andd heat treating.

- Industry and universities should increase co-operation on research and development of new technologies and operating practices to ensure that the curricula reflects the current needs of industry.

9. *What changes are you making in recruiting strategy for fields highly sought in the steel industry (metallurgists, computer engineers, etc.)?*
   - Many engineers go into the management of the manufacturing process - more emphasis on technical degrees.
   - We are starting a campus partnership program with our key recruiting schools. Funding will pay a big role.
   - We are recruiting globally for our locations around the world.
   - Focused approach.

10. *What does your company do to promote/provide/encourage continued education in ferrous metallurgy? At the plant? At universities in close proximity to your company? At short courses sponsored by AIST and other professional societies?*
    - Our company provides 100% reimburement for continuing education in professional development areas.
    - We have developed 'SMS Demag Akademie' our own educational and vocational training facility in Germany providing relevant courses to our employees in Germany and around the world. We participate in partnerships with our customers to enhance our engineering and equipment design. We provide continuing education for our employees at universities in proximity to our locations around the world. We support and actively participate in professional and vocation at courses offered by organizations such as AIST.
    - Educational assistance is offered. Joint project are conducted with certain universities.

11. *Does your company encourage and support employee participation in professional societies, including writing and presenting technical papers? Is this type of participation regarded as important as part of their overall annual performance reviews?*
    - Yes. We pay for membership and Encourage participation in these. Professional society participation is an important piece of succession planning for all positions.
    - Absolutely, as an example SMS Metallurgy is presenting 20 papers at Tech 2008.
    - Yes. Employees participate in AIST programs.

12. *Many companies are now focusing their hiring on a few "targeted universities." Is this the best overall industry strategy?*
    - Material Science with some emphasis in metallurgy is the determanent - the number of universities with this focus is shrinking - the target is smaller.
    - The utilization of co-op programs appears to be more attractive to students at universities that are in reasonable proximity to our locations throughout the world.
    - This answer depends on the analysis that takes place for selecting targeted schools. Going to a school just because the CEO graduated from that institution may be a waste of money and effort. of course, you may have to do that anyway
    - Yes.

Questions: University Professors to University Career Professionals

1. *What aspects of employment are most surprising to students as they enter the job market and as they begin their first job assignment?*
   - That they aren't the top dog anymore. That unlike an internship or co-op where they were still a student, their first position is their only focus now.
   - Students perform well in on-boarding activities and in team environments, but when they are asked to take significant risks and work independently, they sometimes struggle and get

discouraged. Also, going from a sliding scale grading system on campus to an expectation of 'A' work all of the time in the workplace is a major transition for them.

2. *What areas of study do students "wish" they would have been better prepared for?*
   - The whole job search process and when to start. Students think that they don't need to start looking for a position until they are in the last semester of their senior year. They need to first start looking for internships the fall of their sophomore year and start looking for a fulltime position in the fall of their senior year at the very least.
   - Soft skills. The best students academically-speaking may see students with lower GPA levels have greater success because of their strong social skills and leadership experiences.

3. *What are the most common areas of "mismatch" when trying to place students into open positions?*
   - We don't place students-question is not applicable to what I do.
   - This goes back to an earlier answer. When students experience different things than what they were told that leads to mismatch. In the are going to be on a job site or on the plant floor all day then tell them. Don't say they will be at desk most of the day than have it not be that way and vice versa. Some students like certain work environments while others prefer different ones.
   - Background and lifestyle can play a major part, especially if a student has had no experience in any type of manufacturing environment.

Questions: University Career Professionals to Industry

1. *How can the Career Services Department work with industry to improve the overall image of the steel industry?*
   - Help us present a good picture of what we need and the opportunities in the industry.
   - Education, first and foremost. Education of the CSD staff, including career counselors. Site visits for CSD staff will also help dispel myths about the steel industry.
   - Continued promotion of the message that the steel industry is a global industry and that it is a high tech industry.
   - To provide opportunities for greater exposure to students on campus such as open house events, panels and referral to relevant student organizations.
   - By becoming knowledgable of the steel industry and sponsoring 'speaking engagements' for Steel Professionals to address the students.

2. *How can industry help us attract students to the steel industry?*
   - Tell us what works best in your career recruiting process - help us customize our approach to fit your process best.
   - Industry representatives need to visit campus: conduct info sessions and interviews, attend career fairs, and meet with faculty to educate students and faculty about the steel industry and provide students with tangible evidence that the steel industry has good jobs.
   - Promote all forms of co-operation with the steel industry such as joint research programs, co-op and internship rotations.
   - Visit campus and accept invitations to participate in programming.

Questions: University Career Professionals to University Professors

1. *How can the Career Services Department work with professors to improve the overall image of the steel industry?*
   - As previously state, education about the steel industry, including placement statistics, benefits of working in the respective industry, career growth potential, etc., is very important. CSD staff and faculty need open lines of communication regarding the pros and cons of the

industry. CSD staff will share what they learn on site visits, etc. with the faculty and vice versa.

- CSD staff needs the support and endorsement of the faculty for companies coming on campus to interview or attend career fairs. Faculty should keep CSD staff in the loop when they are contacted directly by industry reps.
- Career Counselors need to be provided with in-depth information about the industry so that they can accurately and appropriately discuss this career path with students. An informal training session with both parties might be helpful.
- Open lines of communication and mutual involvement in steel company visits.
- Be consistent. Some companies did not recruit for several years and all students heard were negatives about the industry. Now these companies come back to campus and find it difficult to recruit. In some cases, the companies returned to recruit with only HR people and no engineers. Engineering students usually want to talk with engineers and see where they work and where their career took them.