

Oak Ridge Centers for Manufacturing Technology — Partnership and Impact on the Semiconductor Industry, part 2

The Oak Ridge Centers for Manufacturing Technology in partnership with SEMATECH (Semiconductor Manufacturing TECHNOlogy) had significant impact on the semiconductor industry and allowed several individuals to chart their career courses to success. There are lessons we can learn from that experience.

Following on from Dr. Dan Hoffman's story we now look at a second letter to Jack Cook from Dr. Ken Tobin, a Corporate Fellow and still working with ORNL, and finally a third letter from Dave Rasmussen, a group leader for the Fusion Energy Division's technology group and the lead for the heating, fueling and vacuum portions of the U.S.- ITER (International Thermonuclear Experimental Reactor). These testimonials cite the ORCMT as their launching pad for successful careers.

Now let's hear from Dr. Ken Tobin of ORNL.

Tobin said, "Hi Jack, What a blast from the past. Thanks for sending this. My many years of working with both SEMATECH and the semiconductor industry were certainly memorable and I would have to say helped truly establish my research career in the computer vision field.

"It's most (although not all) of the reason that I was able to become a Corporate Fellow. The Spatial Signature Analysis (SSA) technology was only one of several yield learning technologies that we developed for the semiconductor industry.

"For example, we developed a number of software tools for Automatic Defect Classification (ADC), and yield learning using image archives in a content-based image retrieval (CBIR) environment – we called this Automated Image Retrieval (AIR). We licensed ADC to Applied Materials and AIR to a number of companies including SEMATECH member companies, Applied Materials, and August Technologies (now Rudolph Technologies). We're still receiving royalties from Rudolph today.

"An interesting segue from the semiconductor industry was the "re-purposing" in 2004 of our CBIR technology to the medical industry. I have been working with a retinal surgeon (MD, PhD) from the Hamilton Eye Institute in Memphis (part of the UT Health Science Center) on the development of a method to automate screening of diabetic retinopathy patients using commercial fungus cameras – somewhat like "yield learning" to detect eye disease.

"We won an R&D 100 Award in 2003 for the AIR technology and we just received an R&D 100 Award in 2010 for the retinal screening technology. I'm going to give an ORICL presentation on the retina screening research on February 23, 2011, in case you are interested. It's been an enjoyable career (thus far).

"Today (since 2008), in my division director role, I have stepped away from hands-on research. I've handed off the retinal screening research to Tom Karnowski, my R&D partner from the Image Science and Machine Vision Group. Shaun Gleason now leads the ISMV Group, which is part of the Measurement Science and Systems Engineering (MSSE) Division.

"Now I'm working on more strategic ventures as we continue to develop and support a broad R&D portfolio in electronics, sensor, signal processing, and integrated systems. We continue to work with industry (for example we manage the ~\$10M annual CRADA with USEC) and we have a very strong WFO portfolio, primarily with DOD, DHS/DNDO, DTRA, DARPA, and the like. We have also been growing our DOE portfolio, mainly in EERE and OE. MSSE has grown since 2008 from about 135 staff to 170, and our BA has grown from \$40M to \$87M. If you are interested, you can read more about MSSE at, <http://www.ornl.gov/sci/ees/mssed/>

“So, all of these past experiences role up into what is my professional life today. It’s hard to say what would be different if it wasn’t for collaborations such as that with ORCMT, but it certainly would have been less enjoyable and fulfilling.

Now look at the letter from Dave Rasmussen, one of the first offsite assignees to SEMATECH who, according to Jack Cook, plowed the way for several other folks who followed him and enjoyed similar experiences. Here are his thoughts and comments on how the ORCMT partnership helped him.

Rasmussen said, “Jack, Much like Ken described, the ORCMT and SEMATECH experience changed my career path. As you know, shortly after I returned I became a group leader of a large group of fusion technologists.

One of the better rewards is the interaction with and mentoring of students. We have had many of them, ranging from high school through grad school and all have been great. For the last few years, I have had a dual role as the lead for the heating, fueling and vacuum portions of the US-ITER project and continuing as the group leader of the Fusion Energy Division technology group.

Fortunately, there is a lot of overlap of technology and personnel so it is a good fit. Most recently we have staffed up my US-ITER team with engineers and designers so we have a big group to manage. The sense of urgency to get our ITER equipment designed, built and tested is increasing as well as the discipline required to get it right.

I read the article you sent and it brought back the memory of how hectic the pace was at SEMATECH and how crucial it was to be responsive and flexible. I had to learn to collect information and make judgements in a timely manner. I am making use of that experience on ITER. There was also great diversity of skills, cultures and priorities at SEMATECH. ITER has even more of that across the seven partners and the broad set of skills required for the project.

Another thought about SEMATECH and ORNL. The SEMATECH mission required a lot of top down planning and leadership since that was the best way to achieve the focus that was needed. However it discouraged some of the creativity and risk taking. The team dynamics could also get difficult at times. In my experience at ORNL, the management of people and programs is much easier with the self motivated, and independent thinking staff.

These are excellent examples of what ORCMT was capable of doing for industry, the nation and even individuals who applied themselves to the technologies being addressed in ORCMT. We can do this again! We have a successful model.

With the current attempts to increase Work for Others activities and the cycle of emphasis being on the upswing again, as well as the large number of employees reaching retirement age, it is a good time to reflect on our past and glean the keys to previous successes. In this look at the history of the ORCMT, other aspects of our history are being surfaced.

For example, did you know that in 1995 the Data Systems Research and Development team in Oak Ridge helped the FBI shorten the response time for checking criminal suspects’ fingerprints from several months to less than five days! That is the type of improvements we can realize when the unique capabilities of the nuclear weapons’ manufacturing system are shared.

More on this later as we examine how Y-12 became designated as a National Prototype Center! Send your ORCMT story to smithdr@y12.doe.gov or call me at 865-851-6423.