



Advancing Workforce **Diversity, Inclusion, and Innovation**

“Diversity is the art of thinking independently together.” Those eight simple words from Malcolm Forbes may seem confusing at first glance, but they effectively characterize the ongoing efforts to define and support workforce diversity at Cummins Inc. As the company’s website states: “Diversity and inclusion means that our individual differences never have to be checked at the door. Our best work is teamwork”.

There is an echo of J. Irwin Miller, the early and long-tenured leader of Cummins in those words. Years-ago he wrote,

“Character, ability and intelligence are not concentrated in one sex over the other, nor in persons with certain accents or in certain races or in persons holding degrees from some universities over others. When we indulge ourselves in such irrational prejudices, we damage ourselves most of all and ultimately assure ourselves of failure in competition with those more open and less biased.”

Today these thoughts are posted prominently in Cummins facilities worldwide.

The modern Cummins organization, based in Columbus, Indiana, is an international producer of powertrains,

filtration products and power generation systems. As an organization of almost 58,000 people, Cummins takes pride in both its engineering and its global footprint, employing technical talent based in offices around the world. Matching these technical teams with one another, nurturing their diverse skills, and harvesting the creative result takes time, effort and also the intelligent use of a variety of tools, like the ones available from a professional organization, like SAE International.

One of the ways Cummins makes this process work for them is through a holistic focus on the growth and advancement of varied individuals. As Lisa Farrell, a 20-year Cummins veteran and Director of the company’s Accelerated Technology Center puts it, “Cummins has always had a strong core value for diversity. It was founded on the idea that real innovation will come from diverse voices, and Cummins promotes that. Diversity improves the product and the customer’s experience of the product.”

Joan Wills, Executive Director of Cummins Electronics and SAE Board Member underlines that thought. “I’ve felt that sense of inclusion in all of the Cummins teams and projects that I have been a part of,” she notes.

In fact, a study published in the Proceedings of the National Academy of Sciences found that a problem-solving team made up of a diverse population usually outperforms a team of high ability, but more homogenous problem solvers. The critical components are personal interaction, communication, and collaboration.

LISA FARRELL



Lisa Farrell is Director of the Accelerated Technology Center at Cummins. She received her Bachelor’s degree from Worcester Polytechnic Institute and her Masters and Ph.D. from the University of Illinois. In her 20 years at Cummins, she has held various technical positions, has been a recipient of the Perr Award, and has been a contributing author on numerous professional papers. She currently serves as a member of the SAE COMVEC Executive Council.

JOAN WILLS



Joan Wills is Executive Director of Cummins Electronics. She holds a Bachelors in Electrical and Electronics Engineering from the University of Dayton; a Sloan Executive Certificate in Strategy and Innovation from MIT; and a Master of Science degree in Electrical and Electronics Engineering from Ohio State. In her 23 years at Cummins, she’s obtained 22 US patents and is a two time recipient of the Perr Award. She currently serves as a member of SAE’s Board of Directors.



Live Engagement with Students

The Cummins concentration on diversity and inclusion begins through early interaction with college engineering students via the reach and leverage of SAE's various specialized events. "We have specifically targeted SAE events to reach students," notes Tara Travis, 16-year company veteran and Director of Technical and Environmental Integration at Cummins. "We have had students involved in the Baja SAE series present their work to us and show us their progress. This gives us a chance to see their ideas and solutions, and them a chance to network with Cummins professionals," she added.

"SAE events are a good place to grow and learn and they are very inclusive. They provide a level playing field for diverse people of similar interests that allows you to build a bigger table for all, instead of erecting higher walls and silos,"

Tara also noted.

The Importance of Publishing

Working with students through SAE events and also by co-authoring and presenting technical papers has led to important recruitment opportunities for Cummins. According to Lisa Farrell, "Publishing and presenting technical papers with students through SAE offers a great opportunity to see students in their own environment, and Cummins gets a lot of job candidates through this interaction. Plus, students get to see Cummins dedication to diversity and to their work."

This co-work with students can follow a productive arc, according to Lisa, from student recognition and networking to publishing, to hiring, and on to intellectual property development and even patents. "The variable valve train technology that we worked on with Purdue led to cylinder deactivation for future Low-NOx technology, and many papers were authored out of that work. This led to student hires by Cummins out of that collaboration. We hire diverse candidates and we develop them to be successful," she noted.

"You need to have the most diverse talent in order to make the best product,"

adds Tara Travis. "One of the many things SAE helps with is providing the opportunity, through events and papers and networking, to see what others are doing in different parts of the industry and the world. If we can harness that diversity early, and propel it forward into the professional world, I believe we can really progress technically," she added.

TARA TRAVIS



Tara Travis holds a degree in Mechanical Engineering from Virginia Tech and is Director of Technical and Environmental Integration at Cummins. Starting as a Test Engineer 16 years ago, she has held multiple roles within the Engine Business Unit including structural analysis and fuel systems integration. In 2017 she was awarded the Rodica Baranescu Award from SAE for women exhibiting technical excellence and leadership in the automotive industry. She is also currently Vice Chair of the Indiana chapter of SAE.



Social vs. Functional Diversity

Cummins global engineering focus is emphatically present in its diverse workforce. But this diversity can also take shape in different ways, according to Alex Yezerets, Executive Director of Advanced Technology in the Corporate Research and Technology Organization at Cummins.

Social diversity is influenced by a number of factors, including culture, geography, background, language, and, lifestyle. These elements obviously play a part in and shape the Cummins workforce. But as an organization active in the mobility field, Cummins engineering teams are of necessity also comprised of people with varied technical disciplines: mechanical engineers, chemical engineers, electrical engineers, and materials engineers. This functional diversity comes into play from a management viewpoint.

As Alex so eloquently describes it:

“A scientist can work in isolation, but good engineering, by definition, is an exercise in diversity of thought, diversity of background, diversity of approach, and involves the ability to adjust one’s communication and perception. SAE provides a common platform of multiple perspectives.”

This “common platform of perspectives” is crucial to the success of the services that SAE brings to the mobility market. SAE events, technical sessions, papers, standards, technical training, and networking opportunities allow professionals across the mobility field to engage, interact, learn, and produce tangible results.

“SAE has become a primary professional community for me,” says Alex, “because through focusing on the application of motion, it integrates multiple disciplinary expertise. Attending SAE events today you will find EE’s, ChE’s, Chemists, Materials Scientists – very much reflective of my direct Cummins team of 120. A partnership with a professional organization, like SAE, is critical in adding to and augmenting what we do internally.”

Alex Yezerets explains, “As much as we, as a company, focus on diversity, inclusion and equity because that is good for business, we can’t do it alone. SAE plays a particularly important part because it is focused on application. It gives people the opportunity to participate, starting from academia as a bridge into industry, and then to professionally grow and stay focused.”

ALEX YEZERETS



Alex Yezerets is Executive Director of Advanced Technologies at Cummins. He received his Ph.D. in Physical Chemistry from the Mendeleyev University of Chemical Technology of Russia and did postdoctoral work in Chemical Engineering at Northwestern University. During his 21 years with Cummins, he has contributed to 32 SAE technical papers and was awarded the Julius Perr Award from Cummins for most impactful patent of the year. He is also an SAE Fellow and has received the John Johnson Award from SAE for diesel emission control work.



Other Opportunities

Cummins also encourages its technical people to get involved in other efforts, like the development of engineering standards with SAE. This allows for additional contact opportunities with peers across the globe, or as Alex puts it, “attracting people to the table and helping them to stay there.” The table represents diversity. The standards development work promotes the inclusion.

This process is also formalized by the company. “Cummins employees are encouraged to contribute to new engineering standards through a quarterly review of those that apply to our business,” comments Tara Travis. She also adds, “Working through SAE helps me to understand that people are different, but if all these differences can work together, they can produce amazing things.”

SUMMARY

Diversity and inclusion are part of the intricate fabric that holds a company like Cummins together and helps drive it forward. As a technical organization, there is a realization that, as former Cummins CTO and SAE Fellow Dr. John Wall once said, “Engineering is a social exercise.”

This thinking is echoed by Joan Wills . “As we go through a transformation in our industry, going from primarily gasoline and diesel-powered cars, trucks and aircraft, to more low carbon technologies, SAE enables interaction with people in start-up companies, academia and larger industries in a pre-competitive and open

discussion forum that can set standards for how new technologies will be engaged,” she notes.

The professional SAE tools such as technical papers, EDGE Research Reports, Events, courses, and standards, that serve to communicate critical information can also add significant value to diversity and inclusion programs industry-wide. They serve to bring different people together at a very common and big table. Furthermore, when companies like Cummins intentionally engage their underrepresented employees with these SAE tools, they empower those employees with tools to help further their growth and development.

“There is a lot of change involved in the technology that is going to be needed to get us to a low-carbon future. The more we can talk together about some of the pre-competitive aspects of this and invest together, the more we’ll be able to move faster as an industry in the world.”

-Joan Wills, Executive Director, Cummins Electronics



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