

News@MIT Sloan

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Schoolwide News

Flying Faster, Higher, and Efficiently

By Sarah Foote

These days, fuel is often on the minds of Americans – when they pay at the gas pump, when the price of an airplane ticket goes up, or when they hear about environmental issues on the news. But fuel, aviation fuel in particular, is frequently on the mind of William (Bill) Harrison, SF '08.

Even though Bill recently stepped down from his position as Chief, Fuels Branch, Air Force Research Laboratory for the United States Air Force, to attend the MIT Sloan Fellows Program in Innovation and Global Leadership, he still has a hand in aviation fuel research, development, and technology, answering e-mails and phone calls from his colleagues at Wright Patterson Air Force Base in Ohio in between classes and the rigorous demands of his master's degree program.

Bill joined the Air Force after graduating from Purdue University on a ROTC scholarship. With a degree in chemical engineering, he began his work with the Air Force right in the middle of the energy crisis of the early 1980s. Ironically, one of his first assignments was to look into alternative fuel sources, and he has spent much of his time working on this topic during the last few years. After six years as an Air Force Officer, he was offered a similar position as a civil servant at Wright Patt (as it is commonly referred to) and traded his Captain's bars for a series of management jobs in the Air Force.

While working for the Air Force, he led the group that conducted research on jet fuel and jet fuel technology. Flying faster and higher has always been an objective for the Air Force, so the work kept Bill and his team extremely busy. It also afforded him the opportunity to work on many projects that he wouldn't have been able to had he worked for a commercial airline. "An Air Force aircraft is like a race car, compared to that of a bus for commercial airlines," he jokes.



Bill Harrison, SF '08 (Stuart Darsch photo)

Bill supervised a group of 65 people that included military personnel, civilians, and contractors, with University of Dayton Research Institute being the main contractor. His group looked into a wide variety of topics including working with fuel so it could

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We welcome story ideas, photos, suggestions, and comments from students, faculty, and staff.

Please send items to:
Sarah Foote, Editor,
news@sloan.mit.edu.

Deadline: 12 p.m.
Thursday for publication
the following week.



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withstand higher temperatures for more fuel efficient engines including hypersonic engines. They also studied the freezing level of fuel for high altitude aircraft such the Global Hawk, the unmanned aerial vehicle. Recently his group has focused on fuels from alternative energy resources.

Bill supervised a research group that studied aircraft emissions – a hot topic these days. “Primarily we were looking at particulate emissions and the effects of fuel chemistry on the formation of particulates. It’s interesting to study due to the health effects of very fine particles but also the effects on the upper atmosphere. Because particulates react with sulfur and grab water, they then form contrails which form cirrus clouds,” he says.

Though his group doesn’t look at the atmospheric effects on jets, they look at what particles and what size particles come out of jet engines. Their testing has taken place on small helicopter engines, on fundamental combustor rigs, and they often go to air force bases to test engines and take measurements. Because his group is active in research and development Bill frequently shares results and information with the Federal Aviation Administration.

On an elliptical journey, Bill spent much of his time during the past three years researching alternative fuels. During this time, he was detailed to the Pentagon to work for the Assistant Deputy Under Secretary for Defense to help him develop the Assured Fuels Initiative. Bill had many discussions with leaders of industries regarding viable alternative fuels, while liaising between the Pentagon and the Department of Energy. He returned to Wright Patterson and was asked by the Secretary of the Air Force to work on a manned flight of an alternative fuel that used coal or natural gas as the feed source. Bill co-led the team that worked through all the technology and systems engineering leading to component tests, engine tests, and finally a series of flight tests on a B-52. “We

took a very conservative approach to this program. We used a 50-50 blend of Fischer-Tropsch with conventional JP-8 jet fuel. The fuel used in the aircraft was made from natural gas, but could be made from coal or biomass,” he says. He adds that the Air Force is very interested in innovation and has also researched other sources for fuel such as biomass (animal fat and seed crops), coal, oil shale, wood chips, and even corn stalks. “Many of these look very intriguing, but will be challenging to commercialize,” he notes.

The B-52 flight tests using Fischer-Tropsch fuel blends went very well. They went so well that the Air Force just had a ceremony at Edwards Air Force Base because the aircraft is the first to be approved for use of synthetic fuels. In addition, the fuel used produced less emission while still performing as well as a traditional jet fuel. “The Air Force doesn’t want a fuel that just works. We want to set the bar higher to look further into environmental aspects as well as performance,” Bill says.

The Air Force is continuing to study alternative sources with an eye on using 100 percent materials fuel instead of a 50-50 mix. He adds that the Secretary of the Air Force has a personal interest in alternative fuels and has set the goal for the Air Force to use 50 percent alternative fuels by 2016.

Bill notes that the Air Force did look into biofuels such as ethanol as a fuel choice but that would have required the redesign of planes and jet engines because ethanol is better suited for cars and other modes of ground transportation. He adds that more ethanol fuel is required to fly the same distance as regular fuel, which defeats the goals set forth by the Air Force. Coal is also an option the Air Force is researching because there is an abundance of it in the United States, but at the same time they are concerned about CO₂ and the global warming issues that arise when it is used, and support reduction technologies such as carbon capture and sequestration.

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“We are looking at things from the eye of the user. Can we get to a fuel that is suitable for aviation? It’s very rigorous to get there – much more rigorous than getting an alternative fuel to work in a car. Your car can break down in the middle of a trip, but a plane cannot. It poses a lot of challenges. We want to set the stage so that the market determines what are the best alternatives,” says Bill. The Air Force is also working with the Civil Aviation Alternative Fuels Initiative (CAAFI) to see how alternative fuels might work for the commercial aviation sector. “There is little research into alternative fuels in civil aviation. We share information and results with them because the Air Force is always pushing the envelope,” Bill says.

Selecting MIT Sloan

Bill’s Director at Wright Patterson, William Borger, Sloan Fellows Class of 1991, highly recommended the MIT Sloan Fellows program to him. Looking into the program Bill immediately thought it would be interesting, while also providing him with a new set of challenges. He realized that it would give him a new perspective on his work, which is exactly what he was looking for in a management program. He wants to learn how things work from the business side instead of the government side. “When I get back to the Air Force I hope to apply the things that I’ve learned here – especially with regards to investing in research and development. I also hope to work with the people that are shaping the direction of where we’re going,” says Bill, who will report to the Director of Propulsion when he returns to Wright Patterson next summer. He will continue to work with senior people in the Air Force, Department of Defense, Army, and the Navy.

Bill is enjoying the MIT Sloan Fellows Program and is especially impressed with the faculty. He has found his finance and economics classes to be especially helpful to date. With his wife, Bill runs a small antiques business and knows that he can apply the

skills learned in those classes along with his marketing class to the business. “We do it for fun,” he says of the antiques business. “It’s an opportunity to meet people and to travel to antique shows around the Midwest.”

Even though Bill has just begun his fall classes he is especially interested in two of them: 15.396 *Energy Ventures* and 15.993 *Strategic Opportunities in Energy*. “There are a lot of advantages to being embedded in the technical community. This program gives me a great chance to see technologies emerge and work with folks on that side of it. But it has also been fun for me to work in the Washington environment so I can see how decisions are made, how policies are pulled together, and how funding is allocated. I enjoy seeing both sides of things,” he says.

While Bill’s staff does still e-mail him the occasional question, he says his time away from Wright Patt is a good time for them to learn and grow as well. “I’m glad to be here at MIT Sloan and I look forward to using my new skills when I return to the Air Force,” he says.

Quote of the Week

“The most overlooked advantage of owning a computer is that if they foul up there’s no law against whacking them around a bit.”
—Eric Porterfield

A Safety Reminder to Students

Please do not leave personal items unattended, especially in study rooms and public spaces. Burglary is by far the most commonly-reported crime on the MIT campus. We remind you NEVER to leave backpacks, laptops, or other personal items unattended, even for only a few minutes.



Never leave laptops unattended.

If you need to report a theft or lost item, please come to E52-101 and we will be able to assist you.

Doctorate in Business Recruiting Forum

Business scholars have the opportunity to influence both the educational and the corporate sectors, advising leaders of industry, collaborating with colleagues on cutting-edge research, and guiding students and executives in search of new practices. Gain insights about a career in business academia and learn more about different business doctoral programs offered across the country.

This event is hosted by MIT Sloan School of Management and Harvard Business School. To be held Thursday, October 11, 5:30 - 7:30 p.m., in E51-Wong Auditorium. To register go to the website <http://www.hbs.edu/doctoral/docnet/>.

Questions? Please contact Sharon Cayley at scayley@mit.edu or Dianne Le at dle@hbs.edu.

MBA NEWS

Register Now for EFL (Email Forwarding for Life)

The MBA Class of 2009 is now eligible to sign up for MIT Sloan e-mail forwarding for life (EFL) accounts. To set up your EFL, please follow these instructions provided by Sloan Technology Services:

Open a browser and go to sloanspace.mit.edu

Click on the **Control Panel** tab

Click on **Edit My Profile (Photobook)** in Control Panel

Please **read this entire page very carefully**. Choose your alias, and select **OK**

NOTE: you do not want to select your firstname_lastname as this is already your 'formal' EFL

The next page should confirm the EFL default settings as well as the alias you have chosen To specify the e-mail account which you want the EFL to forward your email to:

Click on **Control Panel**

And, then, **Edit my Profile (Photobook)** again

Click on **Address**

Here, you will see the dialogue for changing your forwarding address.

If you have questions, or need assistance, please visit the STS Student Support Office in the basement of E52 or contact StudentSupport@sloan.mit.edu, or, call 258-0600.

Profiles in Manufacturing – Rod Copes, LFM '93

By Lois Slavin, ESD Communications Director

Profiles in Manufacturing is a feature that focuses on LFM alumni, and their careers in manufacturing and operations. We look at how their LFM education helped them advance in their respective companies. In this profile, we spoke with LFM '93 alum Rod Copes, Vice President and General Manager, Powertrain Operations at Harley-Davidson in Milwaukee, Wisconsin.

Q. What do you find appealing about manufacturing or operations as a career?

A. The product has a lot to do with why I find manufacturing appealing, and nothing is cooler to me than making engines for Harley-Davidson. I also like the opportunities for continuous improvement and the fact that there is always room for measurable growth. Some people may find this frustrating, but I feel it's enormously challenging and rewarding, both personally and professionally. The common theme in all of this is tangibility – in manufacturing you can always see tangible results.

I'm also gratified by the fact that Harley-Davidson is focused on being close to customers. Everyone at the director level or above is required to attend two customer events annually. This year, I will ride my bike with several colleagues to the HOG (Harley Owners' Group) rally in Louisiana. It's a great way to observe how customers use our products and learn directly from them about what they want next.

Q. Tell me about your current role(s).

A. My responsibilities are both diverse and multifaceted. As general manager of Harley-Davidson's Powertrain Operations, I oversee a facility outside of Milwaukee that manufactures large motorcycle engines and transmissions for our vehicle assembly plants and employs about 1,000 people.

I also work on issues that go beyond my specific factory. In particular, I am the champion for safety, which means that I lead cross-functional teams that make continual safety improvements across the company. In addition, I sponsor a team that is charged with replacing legacy IT systems with a new ERP system.

In addition, in January 2007 I was invited to join Harley-Davidson's Leadership and Strategy Council, which acts as an advisory committee for the CEO around issues of policy and budget. This is a high level group, consisting of about 12 executives, who represent three Harley-Davidson companies – Harley-Davidson Motorcycles, Harley-Davidson Financial Services, and Buell Motorcycles. Members include VPs of HR, Materials, North American Sales, CFO, and our General Counsel among others.



Rod Copes, LFM alum, consults with powertrain assembly line employee Maria Abadie.

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Q. What are the steps in your career path that have led you to what you do now?

A. I joined Harley-Davidson's leadership development program immediately upon graduating from LFM. This enabled me to rotate into several different functional areas, beginning with manufacturing. I worked as the manager of one area within a plant and challenged Harley-Davidson to grow cross-functionally.

I then worked directly for the CFO as Director of Investor Relations, specifically in creating the department. I learned a tremendous amount about communication, leadership and finance, and was the company's spokesperson for Wall Street analysts and the press. That CFO is now our CEO, so it turned out to be an excellent networking opportunity for me.

After that I returned to manufacturing, specifically, I was transferred to a plant in York, Pennsylvania, where I was responsible for 1/3 of the workforce – over 3,000 people – for two years. The environment was challenging because of the rapid pace of growth and the introduction of several new products, all of which resulted in some challenges in labor relations. I learned a lot from a great leader – the VP of Operations – specifically, how to step back and reflect when stressed or challenged and use those things learned to become more flexible and adaptable to people and situations.

I then went back to Milwaukee to work as Director of Marketing for our touring motorcycle platform. This was a fascinating opportunity to work on the product development side and learn to understand what small changes were feasible to implement. I worked a lot with focus groups, then with decision makers in engineering to incorporate dozens of small changes, like reducing the level of clutch effort for smaller and female riders.

I also worked on a more global level to determine whether to develop a new product line, new models, or a totally redesigned platform. A good example was the Road King Custom model, in which we took a touring motorcycle and made it look more customized. I helped to develop the concept and look, and also worked with the factory to produce it. I was then promoted to be the General Manager of our smallest plant, which consists of 400 employees and is located in Tomahawk, Wisconsin. It manufactures components such as windshields, fairings, saddlebags, and sidecars.

Q. How has LFM contributed to your success?

A. LFM exposed me to many different approaches, tools, and learning opportunities, such as plant tours, that provided a solid foundation from which I could put into practice what I'd learned. LFM also exposed me to a very high caliber of peers, professors, and LFM partner company executives. The opportunity to get to know manufacturing professionals and top level leaders from around the world was priceless.

Q. What are some of the challenges you face in your career and how does LFM help?

A. The business world is very fast-paced and dynamic. LFM taught me how to take time to reflect in order to think through what happened and what is happening, then make appropriate choices. This also helps me grow as a person and as a leader. No matter where I've gone, reflection has been essential throughout my career.

LFM also taught me about work-family balance. A large number of our proseminar speakers spoke about this to our class and I was really able to put this into action in my own career. I have four kids, ages 5-12, and I don't want to miss their childhood. LFM taught me to find a company that would be a good fit for me and Harley-Davidson is perfect. I am able to coach

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my sons' in basketball. Moreover, I've seen several of my very successful classmates be able to do the same with their families and careers and we support each other in this.

Q. What career opportunities do you see in the coming decades for managers with strong engineering backgrounds?

A. I'm a little biased because I am an engineer. I believe an engineer with a business background and Big M experience can go into any industry or travel any career path because she or he has an adaptable skill set – a technical foundation that couples logical problem-solving skills with Big M and leadership.

Professionals with this background can go into a start-up or traditional manufacturing or operations company and work in marketing, finance or plant management. From what I've seen in my own career, the best and brightest are not afraid to go into manufacturing.

Working for an LFM partner company can be especially rewarding, because they are already vested in LFM through sponsoring internships or participating on the LFM operating committee. They understand how critical it is to have LFM talent and they are hiring LFMs to be their future leaders. Therefore, LFMs who go to work for a partner company have a leg up on their colleagues in terms of being exposed to right projects, leaders, and opportunities.

Q. What advice do you have for current and prospective LFMs?

A. I like to say that “fit” – or “fitment,” which is a word I've coined – is a big part of success. Make sure you are very interested in what LFM offers in a two year experience – an intense, dual-degree program. Similarly, look carefully at the fitment of who you are and the employers you are considering, particularly in terms your personality, work style, and career objectives.

You will run into a lot of leaders in your career – both good and bad. Take the time to reflect, learn, and grow. For example, at Harley, it's not only what you do but how you do it. Even if you make your numbers, if you roll over people you'll never succeed.

Alumni Talk: Innovation and the Future of Technology for Securities Trading

Speaker: Tyler Moeller

Tyler Moeller, '98, MNG '99, CEO of Broadway Technology and innovator of high performance enterprise trading systems, will discuss innovation and the future of technology for trading securities in the global financial markets, where the stakes are high, speed and reliability are essential, and agility is the key to a long term competitive edge.

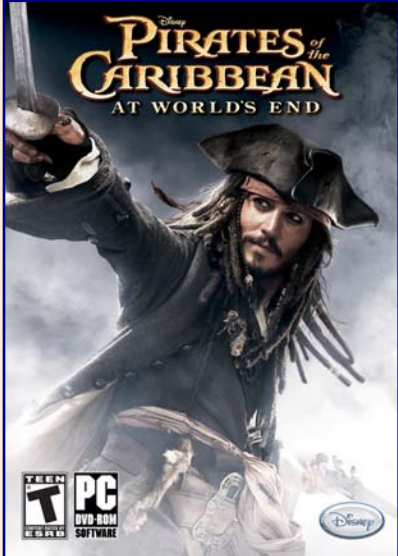
The electronic financial marketplace is evolving rapidly, competition is intense, market opportunities are short, and decisions are quantitative and automated. New software approaches are required to develop trading solutions that can be deployed fast while taking full advantage of these opportunities, combining large amounts of disparate data together in record time across global networks. Moeller will discuss the computer science problems and solutions involved, including highly scalable low-latency distributed system design and its application in the financial world, especially advanced automated trading environments.

This event takes place Wednesday, September 26, 6:00 – 7:15 p.m., in 10-105. Open to the general public. For more information contact Katie Casey, 617-452-3372. Please register at <https://alum.mit.edu/smarTrans/user/Register.dyn?eventID=16301&groupID=194>

CAMPUS CORNER

MOVIES

NOW PLAYING ON CAMPUS...



(Photo courtesy of Google Images)

Pirates of the Caribbean: At World's End (2007)

Will Turner (Orlando Bloom), and Elizabeth Swann (Keira Knightley) are allied with Captain Barbossa (Geoffrey Rush) in a desperate quest to free Captain Jack Sparrow (Johnny Depp) from his mind-bending trap in Davy Jones' locker, while the terrifying ghost ship, The Flying Dutchman and Davy Jones, under the control of the East India Trading Company, wreaks havoc across the Seven Seas. Navigating through treachery, betrayal and wild waters, they must forge their way to exotic Singapore and confront the cunning Chinese Pirate Sao Feng (Chow Yun-Fat). Now headed beyond the very ends of the earth, each must ultimately choose a side in a final, titanic battle, as not only their lives and fortunes, but the entire future of the freedom-loving Pirate way, hangs in the balance.

Showing on September 28 at 6:30 and 10:00 p.m. in 26-100 and again on September 30 at 6:30 p.m. in 26-100.

From the Lecture Series Committee website. All movies are just \$3.

AROUND TOWN

Things to do in Boston & Cambridge

Boston Wine School - Wine 101: Wine Tasting for the Complete Novice

Back-to-basics for wine lovers just starting to understand wine, wine tasting, grapes, and wine making. No required reading, but lots of required tasting!

In Wine 101 we talk a lot about how to understand and remember what wines you like and how to communicate that to people in a wine shop or a restaurant. Wine 101 always take a fun and light-hearted approach to how we taste wine so people don't feel like they have to be experts just to have a valid opinion. In just four classes, you'll have a short list of favorite whites and favorite reds that you can rely on when you're shopping, ordering, and exploring new wines. Price is \$200 and includes bread, olives, and cheese.

This event takes place Thursday, September 27, 6:30 - 8:30 p.m., at Jonathon Alsop's Boston Wine School, 1354B Commonwealth Ave., Boston. For more information contact jalsop@invinoveritas.com, 617-784-7150 or visit <http://www.bostonwineschool.com/fall2007.shtml>.

From the Calendar section of the *Boston Globe*.