

## Brazil Fields 3 Teams Into US's SAE Aero Design Competition

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Last year, the Keep Flying team, from Brazil, comprised of 25 engineering students at the Polytechnic School of the University of São Paulo (USP), won the 8th Aero Design Competition of the Society of Automotive Engineers (SAE-Brazil) with their creation, a radio-controlled cargo airplane capable of transporting 12.135 kilograms of useful payload.

The first place, in the Regular Class category, earned the team the right to represent Brazil in the next SAE Aero Design East Competition, to be held from May 04 to 06 in Florida, United States.

One of the students in the team is fourth-year naval engineering student Sophia Marzouk, 22 years old, daughter of a Tunisian engineer and a Brazilian mother. Sophia has Tunisian nationality, and she usually travels to the Arab country once a year to visit her relatives.

Currently, she works in the naval management area at Transpetro, a subsidiary of Brazilian state-owned oil company Petrobras. "This was the first time that the Polytechnic team won first place. It is a first-of-its-kind title," Sophia said.

The Regular Class, category in which Sophia's team belongs, is comprised only of graduation students. Once a year, SAE Brazil and SAE International, based in the United States, promotes the Aero Design project, turned to engineering students. The goal of the competition is to promote the exchange of technique and knowledge between graduate and postgraduate engineering students.

According to the captain of the team, Rodrigo Sauri Lavieri, a fifth-year naval engineering student, the Keep Flying team was created in 2003 and has participated in the Brazilian competition five times.

This year, though, for the first time, he is going to participate in the competition in the United States. The team includes students from all fields of engineering, since the project requires specific knowledge in each field, such as electric, mechanical, mechatronics, naval and aeronautical, among others.

Last year, the Aero Design Competition in Brazil brought together a total of 65 teams. In addition to the Brazilian groups, also participating were teams from Venezuela and Portugal.

"The Brazilian competition is usually quite fierce. Many of the teams that win here, also win in the United States, Sophia said. Proof of this is the fact that students from other Brazilian colleges are already three-time champions in the SAE International competition.

According to Lavieri, the fact that Brazil has already won the United States competition three times brings great responsibility to the team.

"I am quite conservative when it comes to risking a forecast, but I think the team is much more motivated this year. We can make a nicer, more sophisticated project," the student said.

The Keep Flying team will not be the only Brazilian team to compete against the more than 60 other participating teams in the United States. Two other Brazilian groups will be competing, the Uirá team, which finished second place in the Regular Class, and the EESC-USP Charlie, of the São Carlos School of Engineering, also of the USP. Other competing countries are the United States, Colombia, Venezuela, Morocco, and European countries.

According to Sophia, the airplane that will be presented in the United States competition will not be the same as the one shown in Brazil.

"It will also be a cargo plane, but we had to develop a new project, because the requirements are different," she said.

The student explained that the material used for manufacturing the airplanes is balsa wood, which is very light, and carbon fiber. A project of this kind takes six months on average to complete.

#### Cost-Benefit

According to Lavieri, the cost of the airplanes is high. Each has an average cost of between US\$ 970 US\$ 1,450. Overall, last year's project cost approximately US\$ 6,300, including the spare aircraft, a flying prototype, equipment and material.

Last year's team counted on the sponsorship of Petrobras and of company NSK Brazil, a maker of bearings. They also had the support of Black & Decker, Alltec do Brasil, a maker of carbon fiber, and of the Institute for Technological Research (IPT), among other institutions.

Apart from the students having had to try to keep control of the cost, they also had to make an effort to stay awake all night long. "We worked all through some nights writing reports and assembling the project," stated Lavieri.

For the competition in the United States, the team has already had to send a 30-page technical report about the project and will also have to make an oral presentation to a panel of professionals in the area. Finally will come the presentation of the aircraft.

"It is undoubtedly worth it. It is very gratifying to see the end result," stated the captain.

## Surprising

According to the team guide, Alexandre Kawano, an engineering and mechatronics professor, the students did exceptional work. "In the technical point of view, they did some surprising work," he said. According to him, participating in this competition is very good for learning.

"They study more than we require and learn more than we teach due to the competition. Apart from that, there is all the teamwork and relations, which is very great learning," he said.

Kawano entered the coordination of the team last year. It is the students themselves who chose the professor. "I started with luck," stated the professor, who is also going to accompany the team in the United States.

The Keep Flying team is also going to participate in the Nasa Engineering Systems Award, which is going to give the participants in the SAE International championship an opportunity to apply best engineering practices to their aircraft.

According to Lavieri, this project is different from the SAE International competition one as it consists only of sending a report about the methodology used for the project. "A team of NASA engineers evaluates our project and gives us feedback. The award is, in reality, more of an opportunity for the students than a competition," stated Lavieri.

Established in 1991 by executives in the automotive sector, SAE Brazil is currently the most important engineering and mobility society in the country, with over 4,000 associates and 11 regional sections throughout Brazil.

SAE Brasil is connected to SAE International, which was established in 1905, in the United States, by industry leaders, like Henry Ford, Thomas Edison and Orville Wright.

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