



## ANSYS Simulation Ensures Integrity Of 2014 FIFA World Cup Stadium

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PITTSBURGH, June 11, 2014 /PRNewswire/ -- Tens of thousands of football fans can focus on the action on the pitch during the upcoming FIFA World Cup without having to be concerned about the structural integrity of the stadium, thanks to engineering simulation technology from ANSYS (NASDAQ: ANSS). Multiphysics analysis validated that the fierce Brazilian winds won't impact the safety for spectators and teams in the Estadio Nacional Mane Garrincha stadium in Brasilia. Engineers completed the analysis in two weeks – about one-tenth the time required for traditional wind-tunnel validation – for 66 percent lower costs compared to physical testing methods.



The stadium was originally built in 1974 and was refurbished to include a new facade, metal roof and stands — as well as a lowered pitch that offers unobstructed views from every seat. NOVACAP, a Brazilian state company involved in construction in Brasilia, worked with Paulo de Mattos Pimenta, professor at the University of Sao Paulo, to validate the stadium's structural integrity from a wind-loading perspective. Because of tight deadlines, the validation had to be completed in only 15 days, 90 percent less time than is needed to build a scale model and perform wind-tunnel testing.

Simulation specialists at ANSYS channel partner ESSS used ANSYS® computational fluid dynamics software to predict airflow around the stadium and pressure on the stadium roof. The specialists also used ANSYS finite element analysis software to study the combined effects of wind, stadium infrastructure and a traditionally rowdy crowd.

"Based on the results from ANSYS, I recommended several changes, such as increasing the number of cables and cable tension," Pimenta said. "This is the first time that multiphysics simulation has been used as the primary tool for validating the design of a major stadium in Brazil for wind loads."

"The World Cup is one of the most exciting sporting events imaginable, and ANSYS is very excited to be a part of its success," said Gilles Eggenpieler, fluids product manager at ANSYS. "As the World Cup stadium proves, simulation is revolutionizing the design process by reducing the need for costly physical tests in nearly every industry. This saves users time and money and also results in breakthrough designs, like Estadio Nacional Mane Garrincha."

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ANSYS also has a strong presence on the major social channels. To join the simulation conversation, please visit: [www.ansys.com/Social@ANSYS](http://www.ansys.com/Social@ANSYS)

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**Contact** Media Tom Smithyman  
724.514.3076  
[tom.smithyman@ansys.com](mailto:tom.smithyman@ansys.com)

Investors Annette Arribas, CTP  
724.514.1782  
[annette.arribas@ansys.com](mailto:annette.arribas@ansys.com)

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