Solar Turbines specializes in turbo-machinery for energy generation. Often times, this machinery is protected inside of a ventilated enclosure. The ventilation system creates a pressure differential between the outside atmosphere and inside of the enclosure. This requires technicians to shut off the ventilation system prior to opening the enclosure doors. Solar Turbines tasked the team with creating a system to simplify the opening and closing of these pressurized doors.

The team designed a mechanism that uses leverage as a means of delivering pull/push forces to open and close the doors within real operating conditions. The mechanism is fully mechanical, ergonomic, and safe for technicians.

Positive Pressure
22.28 lb Force (Push) for 3.8 inch H₂O

Negative Pressure
20.3 lb Force (Pull) for 3.7 inch H₂O

Experimental Overview
Testing was performed with an 8.8 in H₂O static-pressure blower and a custom wooden testing rig built by the SDSU Team. A full scale door was constructed to simulate realistic operating conditions (force/pressure) whilst a 1/8th scale volume was held to save space and cost. Force and pressure values were collected at 1/16th door offset intervals using a digital manometer and force gauge; force and pressure were plotted vs distance of door opening. It should be noted that gravity was also factored into the data due to the orientation of the door on the testing rig.