

This is how NASA releases almost a half-million gallons of water in 60 seconds

October 24 2018, by Evan Gough



Credit: NASA

As rockets become more and more powerful, the systems that protect them need to keep pace. NASA will use almost a half-million gallons of water to keep the Space Launch System (SLS) safe and stable enough to launch successfully. The system that delivers all that water is called the Ignition Overpressure Protection and Sound Suppression (IOP/SS) water deluge system, and seeing it in action is very impressive.

The moment of launch is a dangerous time for any rocket due to the incredible energy released. The SLS is an extremely powerful design—it will be the most powerful booster ever built—and the extreme heat, sound pressure, and acoustic vibrations must be controlled to protect the SLS, the Orion capsule, and the launching pad. The SLS's 4 RS-25 engines and 2 boosters produce a combined 8.4 million pounds of thrust, and along with the heat produced, there is an extreme amount of acoustic energy.

To control all that energy and keep crew and equipment safe, NASA employs the IOP/SS water deluge system. It has been in place since the days of the Space Shuttle Program. But with the upcoming launch of the SLS in 2020, the system needed to be upgraded to handle the additional load. NASA tested the system on October 15th, and the test was a success.

The system will release approximately 450,000 gallons of water across the mobile launcher and Flame Deflector to control the extreme energy generated by the rocket during ignition and liftoff. The video of the test shows the water shooting up into a 100 ft. geyser. But during an actual launch the mobile launch pad will be in place and the water will flow through the piping in the pad.

After a previous test in Jan. 2018, Nick Moss, Pad Deputy Project Manager explained it like this: "A geyser occurred because the mobile launcher was not present at the pad. When the mobile launcher is sitting on its pad surface mount mechanisms, the rest of the IOP/SS system is connected to the pad supply headers and the [water](#) will flow through supply piping and exit through the nozzles."

NASA is building the Space Launch System (SLS), the Orion spacecraft, and all of the ground systems necessary as part of their deep space exploration plans. The system is designed to take astronauts to the moon,

to Mars, and to destinations further into the solar system.

The first launch of the SLS is scheduled for June 2020. It will be an uncrewed launch designed to test the performance of the system, including the IOP/SS.



The IOP/SS system deploys almost a half-million gallons of water in one minute to protect the SLS during launch. Image Credit: NASA

Provided by [Universe Today](#)

Citation: This is how NASA releases almost a half-million gallons of water in 60 seconds (2018, October 24) retrieved 27 April 2024 from <https://phys.org/news/2018-10-nasa-half-million-gallons-seconds.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.