Restart of Large Hadron Collider now November

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(AP) -- Repairs to two small helium leaks in the world's largest atom smasher will delay the restart of the giant machine another month until November, a spokesman for the operator said Thursday.

James Gillies said an additional setback to the timing could result if some other problem is found, but the European Organization for Nuclear Research is taking pains to make sure it avoids another major shutdown like the electrical failure of Sept. 19.

"Essentially what's happening is we're proceeding with extreme caution," Gillies told The Associated Press. "We have to be absolutely certain that when we switch on this time, it stays switched on."

The organization, which is known as CERN, has nearly finished examining the 10,000 electrical interconnections like the one that failed in September. Originally CERN said it expected to start test collisions in April, but that start up date has been pushed back several times already, most recently to October.

"Decisions will be taken as to whether there are more that need repairing or not within the next couple of weeks, and when we know that, we will be in a position to be a little bit more definitive about what we plan to do for the rest of the year," Gillies said.

If a November start holds, it will still take until December for the accelerator in a 17-mile (27-kilometer) circular tunnel under the Swiss-French border to start producing collisions of subatomic particles.

Only then will physicists be able to probe deeper into the makeup of matter.

They hope the fragments that come off the collisions will show on a tiny scale what happened one-trillionth of a second after the so-called Big Bang, which many scientists theorize was the massive explosion that formed the universe. The theory holds that the universe was rapidly cooling at that stage and matter was changing quickly.

The leaks currently being repaired were found in the system that uses liquid helium to bring the temperature inside the accelerator to near absolute zero, colder than outer space.

That low temperature makes it possible to use the massive superconducting electromagnets that control the beams of particles that will fly in both directions around the accelerator at near the speed of light until the scientists make them collide.

CERN expects repairs and additional safety systems to cost about 40 million Swiss francs ($37 million) over the course of several years, covered by the organization's budget. The overall Large Hadron Collider project cost $10 billion.