The company that makes external fuel tanks for NASA's space shuttles announced Wednesday that it will lay off between 700 and 800 workers by Oct. 3 because of the suspension of the shuttle program.

It was the second such layoff announced this year by the Martin Marietta Michoud Aerospace assembly plant in New Orleans. In April, about 700 Martin Marietta employees lost their jobs because of the suspension of the shuttle program.

NASA suspended the program after the shuttle Challenger exploded shortly after takeoff on Jan. 28, killing all seven people aboard. The Challenger's external fuel tank made by Martin Marietta was ruled out as the cause of the blast, but suspension of the program meant less demand for the tanks, said Martin Marietta spokesman Evan McCollum.

President Reagan's recent announcement that another shuttle will be built was good news for the company, McCollum said. But, he said, there is little hope that anyone will be rehired for several years.

"We won't increase tank production until 1990," he said. The layoff announcement was yet another blow to New Orleans' beleagured economy, where unemployment has stayed at about 11 percent for months. Statewide unemployment is about 12.6 percent.

"We are taking a number of steps to assist those who are affected to find other employment," Richard M. Davis, president of Martin Marietta Michoud Aerospace, said in a prepared statement. He said the company is trying to find work at other Martin Marietta plants for many of the affected workers. About 3,300 employees will remain at the plant after the October layoffs, the company said in a news release.

Martin Marietta is one of several companies bidding for a contract to build a space station for NASA. State officials have estimated that winning the contract could mean as many as 1,900 jobs at the New Orleans facility.