

PAVING THE WAY

Lockheed Martin claims nuclear fusion breakthrough

By JULIE JOHNSON
 feedback@livemint.com
 WASHINGTON

Lockheed Martin Corp.'s secretive Skunk Works unit, which designed the U-2 spy plane and F-117 stealth fighter jet, is developing a reactor to harness nuclear fusion, the process that powers the sun.

The reactor would be small enough to fit in a truck and generate enough energy to light 80,000 homes, the Bethesda, Maryland-based company said today. The reactor would burn less than 20kg of fuel in a year, producing waste that's "orders of magnitudes less" than the ash and sludge spewed from coal plants.

Lockheed is building on 60 years of research into fusion, a technology that promises to release more energy than current commercial units using nuclear fission, without the risk of Fukushima-style meltdowns. The technology could be de-

ployed within a decade and would be smaller and easier to make than competing concepts, Lockheed said in a statement on Thursday. "Our compact fusion concept combines several alternative magnetic confinement approaches, taking the best parts of each, and offers a 90% size reduction over previous concepts," Tom McGuire, compact fusion lead for the Skunk Works' Revolutionary Technology Programs said in the statement.

If the concept proves successful, the technology could provide propulsive power that gives ships and large aeroplanes "unlimited range", Lockheed said. Small fusion reactors could provide a cheap new source of electricity to utilities seeking alternatives to coal and gas, making desalination cost-effective in regions where water is scarce.

Whether that potential is ever realized ultimately "depends on the cost," Paul Patterson, a New York-based analyst with Glen-



Limitless range: A file picture of Lockheed Martin Corp. headquarters in Bethesda, Maryland, the US. The firm says if the concept proved successful, the technology could provide propulsive power that gives ships and large aeroplanes 'unlimited range'.

rock Associates LLC, said in a phone interview. "This is something to look at 10 years from now. Right now, it's at such an early stage, it's hard to get too excited about the implications."

Lockheed fell 0.5% to \$175.19 at the close in New York. The

shares have gained 18% this year.

Lockheed, which holds several patents for the compact fusion reactor, said it could design, build and test the first reactor in less than a year. The Skunk Works team expects to

reactor in Cadarache, France, to help spur commercialization of the technology.

The 23,000-ton project, known as ITER, the Latin word for "the way", aims to lead to a demonstration fusion power plant by producing 500 megawatts of power from an input of 50 megawatts, according to ITER's website.

Unlike the large fission reactors used to generate electricity, fusion reactors wouldn't produce tons of nuclear waste that's radioactive for thousands of years since the fuel consumed is helium, a non-radioactive gas.

The radioactive fuel assemblies in the core of fission reactors create energy by splitting atomic nuclei in a chain reaction. Nuclear fusion combines atoms into more stable forms, releasing excess energy in the process.

Fusion reactors wouldn't be vulnerable to the triple meltdown that occurred after a tsunami hit Japan's Fukushima nuclear station in 2011. Fusion reactions cannot be maintained spontaneously and any disturbance stops the reaction, according to ITER. **BLOOMBERG**