***Exoskeleton Performance***

**New Exoskeleton to Clothe Soldiers**

**$50 Million Project Intended to Increase Soldiers' Strength, Performance**  
by John J. Lumpkin

Source: Albuquerque Journal

The Pentagon is researching a powered exoskeleton that would make soldiers stronger, faster, able to carry heavier weapons and "leap extraordinary heights," according to military documents and officials.

The Defense Advanced Research Projects Agency or DARPA, the Pentagon's research arm, is spending $50 million on "Exoskeletons for Human Performance Augmentation."

Sandia National Laboratories is working on a segment of the project, with a small group of scientists in its Intelligent Systems and Robotics Center developing several technologies, officials acknowledged.

"The idea would be some kind of exoskeleton that would allow a soldier to have increased strength, increased endurance, increased speed," said Jan Walker, a DARPA spokeswoman in Arlington, Va.

The soldier would wear it as an outer skin, rather than operate it, and its functions would optimally become an extension of the soldier's natural movements.

"A guy in combat doesn't need to figure out which button to push," Walker said.

She emphasized the program is in the earliest of stages, with scientists and engineers figuring out what advances are needed to make it work. Tests could be as much as a decade away.

The developers' first task, according to Walker: build a compact, wearable and quiet power generator that would provide the juice for all the other devices on the exoskeleton. It would have to provide power for between four and 24 hours of continuous use.

"We're not sure what kind of fuel to use or how to store the fuel," Walker said.

With greater strength and endurance, the soldier could wear more armor and carry heavier weapons and more ammunition, she said.

DARPA, in documents displayed on its Web site, announced last year it was seeking devices that do one or more of the following:

-- "Assist pack-loaded locomotion"  
-- "Prolong locomotive endurance"  
-- "Increase locomotive speed"  
-- "Augment human strength"  
-- "Leap extraordinary heights and/or distances"

The suits could also be equipped with computers and communications gear that would give soldiers real-time intelligence about their comrades and targets, military documents say.

Such devices have long been the stuff of science fiction, most notably in Robert Heinlein's 1959 novel "Starship Troopers." The story is about the infantry of the far future, with soldiers wearing mobile combat armor to fight alien bugs.

In the 1986 movie "Aliens," Sigourney Weaver fends off the alien hive queen wearing a machine that looks like a cross between an exoskeleton and a forklift. And a whole genre of Japanese animation is devoted to these things.

Walker said the work is going on at various labs around the country. Sandia officials confirmed this week that theirs is one of them, but they declined to give many details.

Lab spokesman John German provided a written statement from project officials. "Sandia is proposing and assessing various solutions for improving speed, strength, endurance and payload," the statement said.

German said project officials declined to provide more information because they have not obtained patents on their work.

German said the lab has received $310,000 from DARPA to work on the project since 1999.

Last month, the Defense Department awarded Millennium Jet Inc. of Sunnyvale, Calif., $1 million under the program "for the development and testing of a one-man vertical takeoff and landing flying exoskeleton."