Russian spacecraft to crash soon, risks unclear

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In this Wednesday, Nov. 9, 2011 file photo, the Zenit-2SB rocket with the Phobos-Ground probe blasts off from its launch pad at the Cosmodrome Baikonur, Kazakhstan. Some of the recent failures of Russian spacecraft may have been caused by hostile interference, Roscosmos chief Vladimir Popovkin said. Popovkin made the comment when asked about the failure of the unmanned Phobos-Ground probe, which was to explore one of the Mars twin moons, Phobos, but became stranded while orbiting Earth after its Nov. 9 launch. The spacecraft is expected to fall to Earth around Jan. 15. ((AP Photo/File)

(AP) -- A Russian space probe designed to burnish the nation's faded

space glory in a mission to one of Mars' moons has turned into one of the heaviest, most toxic pieces of space junk ever.

It will come crashing down to Earth in just a few days.

The Russian space agency Roscosmos' latest forecast has the unmanned Phobos-Ground probe falling out of Earth's orbit Sunday or Monday, with the median time placing it over the Indian Ocean just north of Madagascar. It said the precise time and place of its uncontrolled plunge can only be determined later, and unless someone actually spots fiery streaks in the sky, no one may ever know where any surviving pieces end up.

Space experts agree it's unlikely to pose big risks.

At 13.2 metric tons (14.6 tons), the Phobos-Ground is one of the largest spacecraft ever to plummet to Earth, considerably larger than the two defunct satellites that fell to Earth last fall and landed in the water.

Roscosmos predicted that only between 20 and 30 fragments of the Phobos probe with a total weight of up to 200 kilograms (440 pounds) will survive the re-entry and plummet to Earth.

It's the third satellite to crash out of the sky in under five months: An old NASA 6-ton atmospheric research satellite came tumbling down in September, and a 3-ton German science satellite followed suit in October. But both were well past their prime.

Russia's Phobos-Ground probe is still a mere babe. It was launched in November, and a glitch left it stranded in orbit around Earth instead of bound for Mars to collect soil samples.

"What's different about this re-entry is that it's not a re-entry of an old,

inert satellite that just was expected for years. It's something that is coming down because of an accident ... for me, that puts it in a different category," said Jonathan McDowell of the Harvard-Smithsonian Center for Astrophysics in Cambridge, Mass.

Another striking difference is the 11 metric tons (12 tons) of highly toxic rocket fuel aboard Phobos-Ground, accounting for the bulk of its weight for the long journey to the Martian moon of Phobos. This makes it potentially the most toxic spacecraft to fall ever.

Roscosmos insists all the fuel will burn in the atmosphere and pose no danger, and some experts in Russia and the West share that forecast.

And if it's any consolation, both of the two previous uncontrolled satellites harmlessly showered fragments over water.

"The fuel indeed poses lethal danger in case of close contact, but I haven't heard of a single case of any civilians poisoned by rocket fuel from all the derelict satellites and failed rockets throughout the space era," said Igor Lissov, an independent Moscow-based space observer. "The objective reality is that it burns on re-entry. There is no reason to panic."

Some experts theorized, however, that part of the fuel might have frozen in the cold of space and could survive the fiery descent, posing a strong threat if it spills over populated areas. Such fears prompted the United States to shoot down its USA-193 spy satellite with a Navy missile in 2008.

Some botched Russian rocket launches in the past have showered fragments over populated areas in Siberia and neighboring Kazakhstan.

In the latest such mishap, fragments of a Russian satellite that failed to

enter a designated orbit after its launch last month came down around Novosibirsk, the third-largest Russian city with a population of about 1.5 million, damaging some houses but hurting no one. The fragments of the Meridian satellite, however, fell from a lower altitude at a far slower speed than the Phobos-Ground debris will have on re-entry.

Engineers from the Moscow-based company NPO Lavochkin, which built the Mars probe, said in an article giving a detailed description of the design that its fuel tanks are made of aluminum alloy. That means they should melt early on re-entry, backing up official assurances that the fuel would burn up on its way down.

McDowell said the probability is low that a large lump of toxic stuff will prove hazardous.

He noted that some of the probe's equipment is dense and could survive re-entry, but added the odds are that any surviving pieces will wind up in the ocean.

"All the best rules in the world" put in place to prevent uncontrolled satellites from crashing down do little if any good in the event of a launch failure, McDowell said. "This is always going to be the risk that something breaks, and you end up with a situation like this. You can minimize it, but you can't prevent it entirely."

The $170-million Phobos-Ground mission was Russia's most expensive and the most ambitious space endeavor since Soviet times. The spacecraft was intended to land on the crater-dented, potato-shaped Martian moon, collect soil samples and fly them back to Earth, giving scientists precious materials that could shed more light on the genesis of the solar system.

The probe was successfully launched Nov. 9 and entered a preliminary

orbit where its engines were supposed to fire to set it on its path to Mars. They never did, and attempts to fix the glitch by Russian and European Space Agency experts failed.

Russia's space chief has acknowledged the Phobos-Ground mission was ill-prepared and risks of its failure were high, but said that Roscosmos had to give it the go-ahead so as not to miss the limited Earth-to-Mars launch window.

Phobos-Ground marked Russia's first planned foray beyond Earth's orbit since a botched 1996 robotic mission to Mars. That probe, designed by the same Lavochkin company, crashed shortly after launch due to an engine failure. The firm also built two other Phobos-bound probes that failed in 1988.

The crash of Mars-96 generated strong international fears because of some 200 grams of plutonium onboard. The craft eventually showered its fragments over the Chile-Bolivia border in the Andes Mountains, and the pieces were never recovered.

Russian officials continue to insist the craft plunged into the Pacific, their way of deflecting criticism for not warning the inhabitants of the impact area and for failing to search for plutonium and other debris.

Fears of radiation also were sparked by the fall of a nuclear-powered Soviet spy satellite that crashed over northwestern Canada in January 1978. The Soviets claimed the craft completely burned on re-entry, but a massive recovery effort by Canadian authorities recovered a dozen fragments, most of which were radioactive.

The Phobos-Ground contains a tiny quantity of the radioactive metal Cobalt-57 in one of its instruments, but Roscosmos said it poses no threat of radioactive contamination.