Advisory Jan 25
January 25, 2012

With today's release of the European Space Agency report on the crash of Fobos-Grunt, http://www.esa.int/SPECIALS/Space_Debris/SEMMXUH8RXG_0.html, all the major space players have been heard from and a reasonable conclusion can be reached about where any debris might have fallen.

But sadly, the apparent consensus – "fell safely into the Pacific Ocean" – isn't reasonable at all.

Instead, a sound analysis of these reports suggests that some of any surviving debris would have reached South America, falling onto regions of Chile and Argentina.

This possibility is described here, but I think it's substantially more probable than that: http://www.msnbc.msn.com/id/46134853/ns/technology_and_science-space/

This debris fall on land includes the heaviest pieces, such as the heat-shielded return capsule carrying three bio-canisters. Slowed by air drag, they would have hit the ground with speeds of only a few hundred miles per hour.

Other hazardous materials, such as eleven tons of rocket propellants, probably did disperse on the way down. But some of the smaller tanks, including a few probably made of titanium despite official claims they were all aluminum, could have survived [as similar objects have done in the past – see http://www.eclipsetours.com/sat/debris.html ]

The reason this conclusion isn't obvious is the confusion – some accidental but some apparently deliberate – between the terms "entry point" and "impact point".

The US Strategic Command defines 'entry point' as the location where the descending probe falls below 80 kilometers [50 miles], where air drag has built up into a destructive force. At this point the vehicle is beginning to 'demise', or disintegrate, with a lot of the structure and contents incinerating and vaporizing.

This massive thermal input is caused, not by 'air friction' as is commonly misreported, but by air COMPRESSION in front of the hypervelocity object[s]. A shock wave builds up at a small distance in front of each object. Some of the super-squeezed air is torn into ions, forming a plasma shroud that carries intense heat into the objects. At the same time, they are being mechanically crushed by deceleration forces of 20 G's or more.

Now, what is NOT obvious is that such objects entering the atmosphere from orbit are not falling straight down. They have an enormous horizontal velocity. It starts out at about 8 kilometers [25,000 feet] per second [Mach 25 or so], but drops off rapidly as it enters thicker layers of the atmosphere.

Nonetheless, a satellite that has passed its 'entry point' STILL is carried FAR downrange by its remaining inertia. It is falling "down" but also a lot "sideways".

Calculations for NASA's 'UARS' satellite that burned up last year indicated that pieces of the craft would fall to Earth in a debris swarm that extended between 500 to 1300 km past the 'entry' point [300 to 800 miles]. This is typical for a large spacecraft with different types of materials. See http://forum.nasaspaceflight.com/index.php?action=dlattach;topic=27593.0;attach=364221

Heavier materials would fly farther, and lighter objects – such as emptied fuel tanks or scraps of engine nozzles – would fall sooner.

For a view of the satellite's 'ground track', See http://1-ps.googleusercontent.com/h/www.universetoday.com/wp-content/uploads/2012/01/580x365xPhobosGruntReentry7-580x365.jpg.pagespeed.ic.yRAMT6kJhw.jpg

The chart shows a good agreement between the Russian 'Ministry of Defense' and the SpaceTrack office of the US Defense Department.

The Russian location was frequently carelessly described in the news media as the observed impact point, but the official who released it made it clear it was an estimation based on calculations from the earlier orbital path. No actual observations – radar, visual, telemetry – existed. It was described as the place where the spacecraft entered the atmosphere.

Nevertheless, this modest and reasonable announcement was then twisted by the Russian Space Agency to be "the exact observed impact point". Moscow newspapers called it the spot "where the satellite dropped off their screens". This is false.

The US point, also based on calculations, is very likely also consistent with Top Secret observations by US missile-warning infra-red telescopes in space. So it is probably the most reliable candidate for location of where entry began [falling to 80 kilometers altitude]

The ground track crosses the Chilean coast between Concepcion and Valdivia in a northeastwards direction, crosses Argentina over the neighborhood of Cordoba and Resistencia, and clips southern Paraguay before entering Brazilian airspace along the Paraná River [it's doubtful anything made it far into Argentina]

It was mid-afternoon during this entry, about 17:50 GMT. Visible fireballs, or even sonic booms, may have been difficult or impossible to observe.

But instead of alerting these nations to warn their citizens to watch out for any such debris, or turn it over to authorities for return to its owner, the Russian Federation government, so far the official Moscow response has been to stonewall the possibility of debris reaching dry land, and to keep insisting like a religious mantra that the probe has "fallen into the Pacific".

This is a self-serving deception. It is disgraceful coming from a major partner in many mutually-beneficial international space projects.

And it is not unprecedented for falling Russian satellites. It is sadly consistent with an old pattern that the world hoped had faded with the last century.

As detailed in an article I wrote for 'New Scientist' [London] in 1999, linked here: http://www.jamesoberg.com/plutonium.html the previous Russian Mars probe ALSO got stuck in parking orbit. It fell into the atmosphere only hours after launch, carrying a number of plutonium batteries that could present a substantial health hazard to any finders.

But based on initial confusion, Russian and American space officials focused on another jettisoned module of the probe that had remained in orbit, mistakenly thinking IT was the probe itself with its plutonium.

After several days of dramatic suspense this object fell back to Earth, over the Pacific Ocean.

Weeks later, when it was realized that this wasn't the real probe, and that the real probe [and its plutonium] had fallen back to Earth unobserved, Moscow just assured everyone that "it fell into the Pacific also" and that no safety measures were needed.

But on the day it had been launched, ground observers in Chile, as well as space-based US military satellites, had seen the fireball of this falling probe crossing the coast and heading towards Bolivia. It was a clear, starry night.

The Russians never recanted. To this day, that probe is officially listed as 'falling into the Pacific'. What the dozens of documented eyewitnesses saw was probably a UFO.

The current policy of denial and coverup out of Moscow is a sad reminder of that past deception, and of other earlier ones involving falling nuclear satellites such as Kosmos-954 over Canada. See http://www.jamesoberg.com/usd-rorsat.pdf for details of explicit Soviet-era falsehoods issued to the worried world over those space crashes.

The world – and the people of South America – deserves better. Those old habits need to be left behind.

By the way, to end on a humorous note: This part of the world is not a stranger to Russian space visitations in strange form. The Chile-Argentina region has been haunted by Russian rockets for decades, as Russian space vehicles bound for high 12-hour orbits perform their standard post-launch "apogee kick" maneuver. They then do a leftover fuel dump, as a safety measure. This creates -- when the fly-over occurs soon after sunset -- a glowing circular cloud rapidly crossing the skies. These apparitions have sparked UFO panics across the entire region. Nobody in the area ever figured them out and the Russians never disabused them of their excitement.