But Venturestar was not designed to carry passengers, anyway

by Peter Wainwright (Space Future)

TDF. With the cancellation of the X-33, will we or will we not have a reduction of the cost of orbital flight?

PETER. I don't expect to see a reduction, however, this does mean that a new generation of commercially viable vehicles is going to come from the private sector and not government space agencies. The X-33 and X-34 are just the latest in a long line of cancelled prototype vehicles, and based on past and current performance, there is no reason to believe that the future will be any different in the government sector. Of course, as is increasingly obvious in the aftermath of Dennis Tito's visit to the ISS, the future isn't going to be in the government sector, for which the commercial space industry and those of us who still harbour the dream of going to space ourselves one day should both be grateful.

TDF. Is this a victory of the space bureaucrats, who get to assure their wages for another 20 years with public money?

PETER. A perceptive question. Indeed, if you continuously keep shelving your previous great new hope and replacing it with a new one without actually delivering anything, it's a great way to keep yourself occupied and employed without taking any actual risks or failing to deliver an actual usable product. You can't slip your delivery date if you never have to deliver. So, given what happened to X-33 and X-34, do we have any reason to hope that NASA's recently announced Space Launch Initiative (SLI) programme will be any more successful? Of course not. SLI is concerned with the selection (by NASA, naturally) of the most promising new ideas for reusable launch vehicles. But that's exactly what X-33 was about, too. The maxim about learning from history or being doomed to repeat it seems all too appropriate.

TDF. Was X-33 such a bad project?

PETER. Well, yes. Remember that at the time the X-33 project was awarded to Lockheed, rather than McDonnell Douglas, who had already built and flown a prototype, the DC-X. Lockheed's design was chosen from the several proposed vehicles because it was, in the words of then vice president Al Gore, the "most technically challenging". This is insane business logic, as in the business world projects are chosen for their feasibility and return on investment, rather than their difficulty; but NASA is not a business, and therein lies the problem. Since

the whole ostensible point of the X-33 (inspired, or possibly guilt-tripped by the already-flown DC-X) was to create a commercially viable reusable launch vehicle - albeit for satellite launches, not to carry passengers - the whole programme could be said to have self-selected eventual failure from the outset.

However, that's not the only issue. What people forget about X-33 is that it was never intended to be an operational RLV. It was an X-plane, a technology demonstrator. Like all X-planes, it had no immediate commercial benefit, did not go to orbit, and could certainly not launch a satellite. VentureStar was the proposed commercial follow-on to X-33 that was capable of going to orbit, and while it looked superficially similar, it was very much bigger and required technology beyond that which X-33 was supposed to prove. Getting to orbit is an engineering problem an order of magnitude more difficult than X-33's design goals. However, the line between them was consistently blurred in the media, with the result that X-33 was often talked about in terms of being a 'real' vehicle, rather than the test vehicle it actually was. Lockheed eventually stated that VentureStar was not viable commercially because they would need US$10bn to develop it and therefore could not do it without public (or in other words, the US taxpayer) would have to foot the bill - and that's not including the costs of X-33.

Ironically, VentureStar was only capable of launching satellites and its design meant that it could not be adapted to passenger carrying, the only market that could possibly pay back such a large investment. Contrast this to the Kankoh-Maru from Japan, a vehicle with a $2bn projected budget capable of taking fifty space tourists to orbit at a time, and more importantly, paying back its development cost. Space Future has been pointing out for years that RLVs - even ones with reasonable price tags - can't make a business out of launching satellites. There aren't enough to go around, and certainly not the exponentially increasing market that a production line of RLVs would need to establish a business building them. The only thing that does fit this market profile is people, which in the short term means tourists. We call this the 50/50 problem, and it's described in more detail on Space Future in the paper "Space Activities, Space Tourism and Economic Growth ", as well as a few others.

TDF. Should we resign ourselves to follow ISS-shuttles path for next 15 years?

PETER. No, we just shouldn't expect government agencies to help us get to a real commercialised space industry. It's not in their self-interest to see that happen. You don't see an Aviation Agency deciding how jetliners should be built, do you? No, the private sector runs the show, and government agencies like the FAA and CAA regulate them. That's why there are now 3 million people in the air every day.

TDF. What else could really be an alternative? Does some private enterprise have any chance to really compete on this ground?

PETER. While the current state of affairs - dominated by the agencies - continues, no private company stands much of a chance. Several have tried and discovered that it is quite impossible to compete in a situation where agencies exert so much control over the market. In the reusable launch vehicle sector, private companies had the insurmountable hurdle of trying to raise funds where the government (in the form of NASA) is being seen to give funding to a competitor (in the form of Lockheed). This quite effectively stymied the nascent commercial market since venture capitalists and financiers naturally saw NASA as the expert in space and space technology. The fact that the private sector was proposing a reduction in costs of a magnitude or more over current launch systems was almost a liability, since in the minds of non-experts, if it was that easy, NASA would have already done it, surely?

However, things are changing slowly but surely, and the signs are that this long-awaited change is increasing, especially with Dennis Tito's recent and much-publicised trip to the International Space Station. If the history of space transportation had developed along lines similar to the aviation industry we would expect to be seeing several competing commercial RLV manufacturers by now. However, the development of a truly commercial space industry operating independently of government space programmes is inevitable, and when it does happen, this could mean that people like you and me, not just the multimillionaires, could be taking a trip to space.

TDF. Was NASA never really aimed at cutting the cost to orbit in the short term? And now, will they try with a more practical approach?

PETER. Clearly not - they had every opportunity to try, but they failed to follow up any of the most promising approaches. If they were, they would not have cancelled the two most promising programmes they had: the DC-X, and (lest we forget) the X-15, after it was transferred from the Air Force.

They might become more practical now, but I suspect only because they will be forced to. NASA is an immense bureaucracy that consumes billions of dollars of taxpayer's money a year with very little to show for it. The development of a cheap, reusable, and fully commercial launch vehicle eliminates the need for the bulk of this budget. Therefore, simple self-preservation dictates that it's the last thing NASA, or any other government agency, ever wants to see. The successor to the X-33 programme is the SLI, which on paper sounds almost identical, with minor variations. It will take a lot more than that for NASA to convince anyone that they are really and truly committed to reducing the cost of access to space and giving us what we all really want - space tourism.