Statement of

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before the

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Subcommittee on Strategic Forces

Hearing on

Assuring National Security Space: Investing in American Industry to End Reliance on Russian Rocket Engines

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Chairman Rogers, Ranking Member Cooper, and distinguished members of the Committee, I am honored to be asked to appear before this subcommittee to testify on the matter before us today. Before beginning any substantive discussion, I will note that I am here as an independent witness and as a private individual. I have received no consideration of any kind in connection with the topic of today's hearing. I am here on personal leave and at personal expense, and am not representing any company, agency, or committee on which I have served or presently serve.

We are here today because of problems affecting our national security space launch architecture. Because of Russian actions in Ukraine and U.S. legislative response to those actions (Section 1608 of the FY15 National Defense Authorization Act, PL 113-291), the U.S. has determined to end the dependence of our national security space launch systems on the Russian RD-180 rocket engine, the largest and best performing oxygen/kerosene engine in the world. However, even had the Congress not taken such action, future access to this engine would be in doubt. Numerous thinly-veiled Russian threats have clearly shown the risk of continued dependence by the United States on Russia for such a strategic good.

But the RD-180 has been used for two decades on various versions of the Atlas launch vehicle, and without that engine or a functionally equivalent replacement, today's Atlas 5 launch vehicle will be grounded. The significance of this can be understood simply by noting that, today, about two-thirds of our national security payloads go to space on the Atlas 5. Thus, while I completely agree that we should not

be dependent upon a foreign power, much less an adversary, for any element of our national space launch capability, I believe that the legislative action which has been taken in this regard is a bit too abrupt. It might be that we could wean ourselves of this dependence a bit more gently.

The decision to allow the import of the RD-180 and its use on the Atlas launcher was made some twenty years ago, in the mid-nineties, for valid geopolitical and economic reasons. It must be said that, even then, the geopolitical and industrial base consequences of a decision to allow such a strategic dependence upon a foreign power, even as we attempted to build closer ties to that power, were well understood. To mitigate those consequences, it was agreed by all parties that the U.S. would develop the capability for domestic co-production of the RD-180. Regrettably, and for a variety of reasons mostly involving perceived budget priorities, these co-production agreements were never implemented. Now our legal right to do so is about to expire, and it is quite simply too late. This is not a nuanced matter; either a functional American equivalent for the RD-180 is developed, or the Atlas is grounded.

If the Atlas is grounded, what then? The options are both limited and unpalatable. U.S. policy and law require two independent systems for national security space launch capability. This requirement is met, but only partially so, with the Delta 4 family of launch vehicles. Many critical payloads are not immediately interchangeable between launch vehicles, and would require some amount of rework, at considerable cost in time and money, to shift from Atlas to Delta. Moreover, the Delta is in general more expensive than the equivalent Atlas, which in part accounts for the numerical imbalance in favor of Atlas launches. Finally, Delta production limitations are such that without a massive increase in manufacturing and launch infrastructure, very limited surge capacity is available. The net effect of shifting national security space systems from Atlas to Delta will be several years of delay for the average payload, and many billions of dollars of increased cost.

Some have said that the best path forward is to discard decades of government investment in and experience with the Atlas, and develop a whole new system. Now, I must say that in my opinion the U.S. national security launch architecture could indeed benefit from a top-down review and, quite possibly, new policies and systems ranging from ground and flight infrastructure, to maintenance of the required industrial base, to new acquisition approaches. But the kind of broad-based re-thinking that would ultimately result in the creation of one or more new launch systems will require a decade or more to realize, and neither can nor should be done in haste. This does nothing to solve today's problems. And even if it did, it is irrational to suppose that an entirely new vehicle can be obtained more quickly or at less cost than a new engine alone.

Others would have us believe that the U.S. government can merely purchase launch services from among multiple competitors, as if one were selecting a particular

airline for a desired trip based on airfare and schedule. Purveyors of this "launch as a service" view would have us believe that if we have an engine supply problem, the U.S. government should stay on the sidelines while the market solves the problem.

If we are to preserve American access to space while ending our dependence on Russia in the quickest and least costly manner possible, we must reject this view. The fact is that the domestic launch market is essentially a monopsony. Almost all demand is from the U.S. government, while the supply side consists of three providers, each of which offers somewhat different capability. None of these launch providers could remain in business without the pillar of U.S. government demand.

Thus, the U.S. national security launch architecture is a strategic capability having far more in common with the other strategic assets such as fighters, bombers, aircraft carriers and submarines than it does with airlines and cruise ships. The vagaries of the market cannot be allowed to determine whether or not critical payloads make it to space in a timely fashion. Accordingly, the U.S. government must be prepared to ensure that the supply chain required to maintain this critical asset remains intact. That supply chain is currently quite fragile; while we have been supporting the Russian rocket engine industrial base, our own has withered.

To conclude: we have an engine problem, not a rocket problem. I believe we should solve it by building a government funded, government owned American equivalent to the RD-180 as quickly as we can possibly do so. We should not allow the many obfuscating issues which have been raised in connection with this problem to cloud our view of what must be done to solve it.