

Special Presentation to SPST by David McGrath of ATK on October 9, 2014

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On October 9, 2014, David McGrath of ATK (www.atk.com) gave a very informative presentation on “Advances in Solid Propulsion Systems” to a telecom for members of Space Propulsion Synergy Team (SPST). A copy of his presentation figures is on the SPST web site (www.spacepropulsion.org). He covered five major programs that ATK is developing. The first is their effort in the design and development of the Orion Launch Abort Attitude Control Motor and Abort Motor (the Orion Crew Abort System). The advances in these new systems are very promising, in that new control techniques are being developed that were once thought to be impractical with solid propulsion technology. A new proportional valve capability which has had many tests is especially promising, as is the use of new lightweight materials. It was interesting to learn that an inert launch abort escape motor will be flown on the first Orion flight test, EFT-1, planned for this December. The second technology David McGrath discussed was the Low Density Supersonic Decelerator (LDSD) to be used for Mars missions that are considered large for manned flights. This program has already performed one successful flight test. The third program was the STAR 48GXV, which is a risk reduction program for Solar Probe missions. Many advanced materials are being used for this program. The first development test was performed in December of 2013. The fourth program he discussed was the Space Launch System (SLS). ATK is improving upon the Shuttle’s four segment motor with new designs for a five segment motor. This program has performed three tests successfully and has passed a Critical Design Review (CDR). The Qual motor is being processed for a test in 2015. The fifth program presented was the Stratolaunch, owned by Microsoft co-founder Paul Allen. Orbital Science is leading the launcher development and ATK is supporting Orbital with a solid fuel lower stage. The upper stage is a liquid fuel stage. ATK is developing controllable solid fuel propulsion system which will benefit many control applications, including thrust termination. A concern raised by SPST telecom participants was whether thrust termination can be safe enough for crew launch aborts, considering rapid thrust decay and ensuing structural loads. This new capability is

very exciting to the space community. Thanks David for very informative presentation. The SPST members hope to have more informative presentations, such as this one, at future telecoms.

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