

The USAF has launched 6 Titan II space launch vehicles from SLC-4W during the study period. The Titan II space launch vehicle is a medium-sized liquid fueled rocket at 36.0 m (118.1 ft) tall. It has a small-to-medium weight lift capability; additional strap-on GEM solid rocket motors can be added to the first stage to increase the lift capability. All of the Titan II launch configurations were the same, launched without additional solid rocket motors attached and had a thrust of approximately 474,000 lbs.

The Titan II launch noise as measured near the south VAFB haul-out site, which is the closest haul-out to SLC-4W, is unsubstantial and ranks among the quieter vehicles. This is primarily due to its moderate thrust and the relatively long distance to the launch pad. The unweighted SEL measurements ranged from 116.3 to 120.3 dB and averaged 118.3 dB. The C-weighted SELs ranged from 109.6 to 115.0 dB and averaged 112.5 dB. The A-weighted SELs ranged from 83.5 to 95.7 dB and averaged 89.9 dB (DAT). The harbor seal-weighted SELs ranged from 38.2 to 54.5 dB and averaged 47.4 dB. The Lmax values were measured to range from 74.9 to 85.9 dB and averaged 80.1 dB.

Titan IV

The Titan IV space launch vehicle is launched from SLC-4E, which is approximately 8.5 km (5.3 mi) from the south VAFB pinniped haul-out site. The Titan IV series was developed as a complementary heavy-lift vehicle to the Space Shuttle and is by far the largest vehicle currently launched from VAFB. The Titan IV is approximately 44 m (144.5 ft) tall and has a liquid fuel core engine and two upgraded solid rocket motors (SRMU) that provide approximately 3,400,000 lbs of thrust. The Titan IV is moderately loud and is one of the louder vehicles at the south VAFB haul-out site, primarily due to its large amount of thrust. The launch noise measurements for the 4 Titan IV launches measured were all fairly consistent. The unweighted SELs ranged from 125.9 to 130.2 dB and averaged 127.8 dB. Similarly, the C-weighted measurements varied very little, with the C-weighted SELs ranging from 119.0 to 124.2 dB and averaging 121.5 dB. There was a greater difference with the A-weighted and harbor seal-weighted measurements with the A-weighted SELs ranging from 96.6 to 104.5 dB with an average of 101.5 dB (DAT). The harbor seal-weighted SELs ranged from 54.4 to 63.5 dB with an average of 60.3 dB. The Lmax values were determined to range from 88.2 to 100.6 dB and

averaged 95.6 dB. Several sonic booms have been measured for the launches of the Titan IV. The peak overpressures from sonic booms produced by this vehicle range from 1.34 to 8.97 psf. These booms have been measured for 4 launches of the Titan IV and have impacted each coast of SMI.

Evolved Expendable Launch Vehicle (EELV)

The EELV is the Air Force's newest launch vehicle program and will use the Atlas V vehicle from Lockheed-Martin and the Delta IV space launch vehicle from the Boeing Company for launches from VAFB. The EELV program will become the main space launch program over the next several years, replacing many of the other launch vehicles at VAFB. The maximum number of forecasted EELV launches per year is 5, with a total of 68 launches projected through 2020 (U.S. Air Force 2000).

The Atlas V consists of both a medium (V400) and heavy (V500) lift vehicle with up to 5 solid rocket boosters. During the next 5 years, only the medium lift V400 series vehicle will be launched from VAFB. The V400 series will lift up to 7,640 kg (16,843 lbs) into geosynchronous transfer orbit or up to 12,500 kg (27,557.3 lbs) into low earth orbit. The Atlas V consists of a common booster core (3.8 m, 12.5 ft, in diameter and 32.5 m, 106.6 ft, high) powered by an RD180 engine that burns a liquid propellant fuel consisting of liquid oxygen and RP1 fuel (kerosene). The RD180 engine provides 840,000 lbs of thrust on liftoff, and up to three solid rocket boosters can be attached to the common booster core to provide extra lift. There is a Centaur upper stage (3.1 m, 10.2 ft, in diameter and 12.7 m, 41.7 ft, high) powered by a liquid oxygen and liquid hydrogen fuel. The payload fairing is up to 4.2 m (13.7 ft) making the complete Atlas V up to 58.3 m (191.3 ft) high.

The Atlas V will be launched from SLC-3 East, the site of the current Atlas II launch facility. SLC-3 East is approximately 9.9 km (6.2 mi) north of the main harbor seal haul-out site in the area of Rocky Point. Launches of the smaller Atlas IIAS (47.4 m, 51.8 ft, in length and 700,000 lbs of thrust) produced A-weighted sound exposure levels ranging from 87.3 to 88.5 dB at the south VAFB haul-out site. The predicted noise level at the closest haul-out site (10 km, 6.2 mi, from the launch pad of an Atlas V) would be slightly louder than the noise levels from the Atlas IIAS. The maximum sonic boom impacting the Channel Islands would be 7.2 pounds per square foot (psf). The size of the actual sonic boom will

depend on meteorological conditions, which can vary by day and season and with the trajectory of the vehicle.

The Delta IV family of launch vehicles consists of 5 launch vehicle configurations utilizing a common booster core (CBC) first stage and 2 and 4 strap on GEMs. The Delta IV comes in four medium lift configurations and one heavy lift configuration consisting of multiple common booster cores. The Delta IV can carry payloads from 4,210 to 13,130 kg (9,281.3 to 28,946.2 lbs) into geosynchronous transfer orbit. The Delta IV will be launched from SLC-6, which is 2.8 km (1.7 mi) north of the main harbor seal haul-out site at South Rocky Point. The Delta IV will be the loudest vehicle at the south VAFB harbor seal haul-out site. The Delta IV is predicted to have a sonic boom offshore of up to 7.2 psf for the largest of the medium configurations and 8 to 9 psf for the heavy configuration. The size and location of the actual sonic boom will depend on meteorological conditions, which can vary by day and season and with the trajectory of the vehicle.

Space X

The Space X program will launch the Falcon space launch vehicle from SLC 3-West on south VAFB. The Falcon is a light space launch vehicle and will send small payloads of up to 500 kg (1102.3 lbs) into low earth orbit. The Falcon vehicle is 1.7 m (5.6 ft) in diameter and 20.7 m (67.9 ft) in height, making it approximately the size of a Peacekeeper missile. The Falcon is a two-stage liquid fuel vehicle. The first stage is reusable and uses a liquid oxygen and kerosene base fuel. The second stage is expendable and also uses a liquid oxygen and kerosene fuel.

Other Launch Activities

There are a variety of small missiles launched from VAFB, including Peacekeeper, Minuteman III, and several types of interceptor and target vehicles for the National Missile Defense Program. The missile launch facilities are spread throughout northern VAFB and are within 0.65 to 3.9 km (0.4 to 2.4 mi) of the recently occupied Lion's Head haul-out site and approximately 11 to 16.5 km (6.8 to 10.3 mi) north of the Spur Road and Purisma Point harbor seal haul-out sites.

The Peacekeeper missile is an Inter-Continental Ballistic Missile (ICBM) that was developed as part of the United States strategic deterrence force. The Peacekeeper is launched from various underground silos as part of a test and evaluation program. The Peacekeeper is composed of four rocket motors, 21.8 m