

## Pad Work “MEM” (MISSILE ENGINE MECHANIC)

I was an “MEM”, that is a Missile Engine Mechanic . We did the testing of the rocket engines to assure that all would work when you hit the button . It was a complicated process and took a lot of concentration . Each pad had two or three “MEM’S plus our civilian counter parts . These where the people that taught us the “ropes” and generally oversaw the operation . For the most part it was a good working system . It had a flaw in that when we were trained we would not need the civilians any more . In that there were some hard feeling at times but because of the very high professionalism of these men we were able to more than work around that . We shared the work load and most of the time we were glad that we had the extra help .

Our tools of the trade was a unit called the G3016 cart . It was a bank of gages , regulators , and instruments to do the check out of the three main engines and the two vernier engines . The Atlas had two “booster engines and one sustainer . The three main engines set in a line , the boosters on the out side and the sustainer in the middle . The two vernier engines were used to cause the missile to roll . They were up on the side of the thrust section , just above where the separation took place . On lift off all the engines were running . After a short time the two boosters would shut off and then fell away and the sustainer and the vernier engines would do the rest . The missile was high enough that the booster section would pretty much burn up while it came down (I think . It’s been a long time and if I make mistakes please forgive me ) .

The missile uses RP1 and liquid oxygen for fuel . RP1 was just refined kerosene . The RP stood for Rocket Propellant . The Liquid Oxygen tank was on the upper part and fuel (RP1) was on the bottom . The Atlas missile tank section didn’t have any internal structure . The skin was .032 thick and all that held it upright was the pressure in the propellant tank . If you vented the pressure in the propellant tanks the whole tank section would collapse ! When there was a missile on the pad there had to be someone on the pad to monitor the tank pressures all the time . When the sun came out the pressure would rise and then when night came it would fall . You always had to keep adjusting the pressure . It wasn’t very touchy because of the great volume in the tanks . When you had to raise or lower the pressure you would just make the adjustment and come back in a little while and turn it off . We also had what was called a stretch mechanism on the nose of the missile so that we did have to keep a lot pressure in the tanks (1 1/2 psi in the O2 tank and 3 psi in the fuel tank . Again “I think”) . It was simply a ring that was fastened to the nose and to hydraulic cylinder and it just took up the weight of the tank section . There was also a round

bulkhead between the two tanks and the lower tank always had to be at a higher pressure than the top tank . If the top tank got more pressure than the bottom then this bulkhead would “invert” and this was not a good thing !! I did see one missile that had this happen to it . They reversed the pressure and the bulkhead went back the way it was supposed to be . The general concession was that it was not a good thing .

The day a new missile arrived was a busy day ! The missile came to the pad on a skeletal trailer . It was neat as it had two men that rode in little “cabs” by the trailer wheels and they had to help steer because the trailer was so long . I got to do this once , only once , because the cab is not very large and I had some serious doubts that I would ever get out again ( I am 6’ 4“ tall). They would back the trailer into the launcher , and the trailer , missile ,and launcher were all fastened together . Cables were brought down from the gantry tower and fixed to the front of the trailer and the whole thing , launcher , trailer and missile were rotated to the upright position . It was a tense time and everyone was alert and watching . When all the parts were upright , the “stretch ring was fixed to the top of the missile and the pressure fitting were hooked up and the trailer was cut loose and lowered down . And there it stood , in all it’s gleaming glory , like a giant saber for peace . ( a little melodrama if you please ) . Our work was just about to began . All the “stuff” was cleared from the top of the pad and the roll-out platforms were put in and the fun began . Even after several missiles I still loved the arrival of a new one . Life was good and I was loving it !! No one had to tell us to be proud . We all walked a little taller and with that certain swagger , like when you have just done something great and you wanted everyone to know . Even during the first half of my stay when the civilians had the control , it was still good to be part of the operation .

At first there were a lot of “pad” check outs . Everything was checked and rechecked . Soon the engine check out began and I was busy enough to not have a lot of time to just look around . Mostly our part of the checkout was testing for leaks in the miles of hard lines in the missile . Each system would be pressurized and then we would go and squirt “leak check solution“ on all the joint in the lines , (leak check was a bubbly solution that would show bubbles where ever there was an air leak ) . Why didn’t we just use soap ?? Because everything we used in the thrust section had to be LOX (liquid oxygen) compatible . LOX had the bad habit of exploding when ever it came in contact with any hydro carbon substance . (there will be more stories about the evils of what we called “LOX Gel later ) .

Well , no one wants to just hear the technical stuff so lets get on with the fun things that happened on Pad 1 Atlas “A” site 576 SMS. SAC. . (when I first got to VAFB we were a SAC unit later we were a ..... ha I don’t remember !!!! All I can remember was at one point we were the 4300 Missile squadron ??)