

## Crew R-01, 576th SMS, 1960



Crew R01 at 576A

### 576FLTS Hosts Historic Crew Reunion - by Capt Glenn Snow, a 576FLTS member

When asked if the 576th Flight Test Squadron would host the reunion of Atlas Missile Crew R-01, the squadron didn't hesitate. Crew R-01 of the then titled 576 Strategic Missile Squadron, holds the singular fame of being the first all Air Force crew to test launch an ICBM. This historic Atlas D missile flight took place on 26 Jan 1960 from Vandenberg's site 576A.

I had the distinct pleasure of escorting crew R-01 and their spouses and other guests throughout their tours of the 576FLTS and other Vandenberg AFB facilities. Their reunion was originally timed to coincide with the launch of the last Atlas (IIAS version) from Vandenberg, but that launch slipped again at the last moment. Uncertain of when the launch would be rescheduled, the group decided to go ahead with the reunion. This was their first reunion in the 43+ years since they worked together. They felt they had waited long enough.

*(Continued on Page 6)*

### Wen Tsing Chow, Arma and Atlas Guidance - By Daniel Plotnick, mbrno L302, Wyckoff, NJ. Mr Chow was his father-in-law.

*Wyckoff, NJ. Mr Chow was his father-in-law.*

The Atlas ICBM program is well known as the source of many pioneering accomplishments in the development of American missiles and spacecraft. The program established and proved successful the basic systems approach and mechanization of our ICBM guidance systems.

The operational Atlas E and F ICBMs used a self-contained all-inertial guidance system, the first ICBMs to use this technology. Guided inertially without reference to earth based coordinates and using a gyroscopically stabilized platform, it was a self-contained weapons system within itself, immune to jamming and providing accurate guidance over unlimited missile ranges. By enabling salvo launching of missiles, it provided the technological basis for America's "assured destruction" response to any Soviet attack.

*(Continued on Page 4)*

*Mr. Chow and Dr. Bock looking at a guidance pod mockup, the computer is above, the platform below (1960).*



#### The Mission of the Association of Air Force Missileers -

- Preserving the Heritage of Air Force Missiles and the people involved with them
- Recognizing Outstanding Missileers
- Encouraging Meetings and Reunions
- Keeping Missileers Informed
- Providing a Central Point of Contact for Missileers

# AAFM Newsletter <sup>2</sup>

Volume 11, Number 3

September 2003

## A Word from the Association

**AAFM Travels** - Over the last few weeks, your Executive Director has been on the road a lot. I attended the annual awards ceremony at AFSPC and presented the Phillips and Payne trophies for 2002 - the 12MS and 341MXS at Malmstrom were the winners. I represented AAFM at the annual AFSPC enlisted recognition banquet, which we help sponsor with a grant of \$1,500 each year. Carol and I joined the members of the 548SMS for their first reunion in Topeka, and at the banquet I talked about the ICBMs - the past, the present and the future. The following week, I joined three of our board members at the Cold War History conference in Washington, another AAFM project. We provided \$2,500 to the Woodrow Wilson Foundation to assist with the cost of a brochure and report on history projects. As I write this, I am preparing to depart for Montana, with a local area meeting scheduled at Malmstrom for 3 Oct. The following week, AAFM will cosponsor an ICBM Heritage dinner at the AF Academy, along with the Deterrence and Strike Division of AFSPC. AAFM president Jay Kelley will be the featured speaker, and AAFM members will mix with the young men and women who currently work missile and space programs at the headquarters.

**AAFM Coin** - We are in the process of obtaining a new AAFM coin that will be available for all members. It will be a higher quality coin than the ones we present at

*AAFM* is a non-profit, tax-exempt organization under section 501(c)(3) of the IRS Code. The Newsletter is published quarterly, printed by Allegra Print and Imaging, 20905 Western Ave, Torrance, CA 90501, 310-212-7727.

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the competition, one that will be a "permanent" memento. Note the special incentive offer in the One Plus One article on how to get yours free.

**Board Members** - we will elect three board members along with a new representative from 20AF. The terms for board members Andrew, Crouch, Lord and Parker end in 2004. If you would like to be considered by the nominating committee, let me know.

## Letters to the Association

Address your letters to AAFM, Box 5693, Breckenridge, CO 80424, or send by e-mail to [aafm@afmissileers.org](mailto:aafm@afmissileers.org). Letters may be edited to fit - content/meaning will not be changed.

**576SMS Crew R-01** - Have been informed you will include an article on 576SMS Crew R-01. We recently had a reunion at Vandenberg and visited the site where we placed the first ICBM (Atlas D) on alert. We were also the first all Air Force crew to perform a receipt to launch of an Atlas D, 6D to be precise on 6 Jan 1960. All 8 survivors attended the reunion, 7 now remain alive. The 8th, CMS (Ret) Roger Struxness, though close to death from pancreatic cancer and against his doctor's wishes, so wanted to be with the crew at the reunion that he willed himself to attend and made it back to the old A3 Site with the rest of us. He passed away just days after returning home. Indomitable Spirit is truly that of CMS Struxness. *Paul H. Rodrigues MSgt (Ret), Crew R-01, Glendale, AZ*

*Thanks for the followon information about Chief Struxness - he was featured in the article on Page 1 and is listed in our Taps for Missileers.*

**Building 306** - Was building 306 at Grand Forks AFB initially built as a SAGE sector? It sure looks like it. In 1958 when GFAFB began as an operational AFB it was an Air Defense Base. The SAC alert facilities were constructed after the Semi Automatic Ground Environment (SAGE) sector became operational. The SAGE building may have been turned over to SAC to become the home of the 321SMW. *Paul Landry, mbrno L0023. San Antonio, TX*

Just a note to your update on Bldg 306 at Grand Forks AFB. DO9, Codes, or the Missile Control Flight, was part of Operations and located on the first floor along with maintenance and the START Office. *Brian Eastwood, mbrno A0595, Cape Coral FL*

Ops had the Codes Division on the first floor. Was there for the planning and renovation of that area when I was

(Continued on Page 3)

**Letters (Cont)** - Chief of the Codes Division. We moved the training, admin, and my office to a separate area than the vault. Thanks for the info. Brings back memories. *John Mottar, mbrno A1815, Gambrell, MO*

*Yes, 306 was a SAGE building - and I should have remembered where Codes was - I stopped there enough when I was on a crew in the 321SMW.*

**First Missile Wing** - No big deal but for the sake of accuracy I would like to point out that the June article is in error. It should have read ("At the outset, however, before the arrival of the 11TMS - the 1TMS to the 36th Fighter Bomber Group at Bitburg, and the 69TMS (Formerly 69PBS) with the 50th Fighter Bomber Group at Hahn"). Additionally the 7382TMG was a Provisional Organization and as such carried the word "Provisional" after the 7382TMG title. *John BonTempo, mbrno A1883, Falls Church, VA*

I have a correction for the 'First Missile Wing' article. Near the end of the article mention is made: "... the missile units had been responsible to base commanders - the 1TMS to the 36th Fighter Bomber Wing at Hahn." The 1TMS was stationed at Bitburg and the 69TMS was stationed at Hahn under the 50th Tactical Fighter Wing. The wing at Bitburg was the 36th Tactical Fighter Wing. *Joseph Traina, mbrno A1222, Albuquerque, NM*

*The article in the June Newsletter was a reprint of the original September 1956 report in the Hahn newspaper. Obviously, the reporter didn't do his research very well when he wrote it then.*

**Lost Money** - You mentioned a website for people to check regarding money owed them by states. I recently checked a website called Missingmoney.com. Since we all move around so much in the AF, I thought there was a possibility we had unclaimed money. Sure enough, there were two items for us. This is a legitimate site as they refer you to the state department of revenue of the mentioned state, who is holding the money and will send it to you. My husband, Maj David G. Hamlin, passed away in 1982 while we were stationed at Whiteman. This summer I was out west with my youngest adult son and we toured the museum at Malmstrom. Even though my youngest son had not been born while we were at Malmstrom, he thoroughly enjoyed touring the museum and finding out a little more about the jobs his dad had

while in the AF. The museum was very informative and he gained a better appreciation of the mission. *Nancy Hamlin, mbrno SA028, Winter Park, FL*

*Member John Gezelius also told us about web sites that list money owed - since we all moved many times, it's worth checking - you may have some money.*

**From the USNA** - Thank you for the letter you sent earlier this summer with the new 4 year membership. I have just returned to school from a very busy summer of training. I had a surface cruise out of San Diego, a short internship in Washington at Naval Intel, and finally airborne school in Georgia. We had some AF personnel in our jump class and they were all top notch performers. I thoroughly enjoy the newsletters and look forward to making my first local area meeting this year if the dates match up with my leave time. I also was considering attending the meeting in Omaha in May but that will be the week-end of our ring dance which is a fairly important event here at the Academy as you might imagine. There is a chance I could attend from Wednesday to Friday but I am not certain my chain of command could assure me of leave early enough to make reservations. I look forward to the next newsletter and to making my first meeting soon. *John Topolski, MIDN, USN, mbrno SA0042, Annapolis, MD*

*Some of you may remember a Sep 1997 article about John's junior high school history project, a model of a MMIII launch facility. John and his project partner won in the Denver regional competition. He is at the USNA now and has remained a member of AAFM.*

**Whiteman Museum** - Took my family to Whiteman while we were vacationing at the Lake of the Ozarks a few weeks ago. Definitely worth the drive as I hadn't been back there since PCSing in '92. Moreover, it was neat to show my family what an LCF looks like! Whiteman has done a great job of keeping Oscar looking great. It had always been a showcase due to the volume of VIPs that toured it when it was an active LCF. Actually ran into a cop who was doing the same memory lane routine...pretty sure I remembered his being an FSC. *Gary Jones, mbrno A0893, O'Fallon, IL*

**Lost Missileers** - Lee Brannen was a TSgt at Malmstrom 1960-1962. LtCol. Rheuna (Bob) Pfeiffer was a crewmember in the 308SMW, Little Rock AFB 1963 to 1970. John Singeas was a crewmember in the 321SMW, Grand Forks, 1970s. Contact AAFM if you have info.

**Atlas (Cont)** - Not as well known is that the Atlas program is also responsible for pioneering achievements and the development of key concepts and technology in the field of digital computers. One of the two main components to the Atlas E and F guidance system was a digital computer, then often referred to by the engineers and scientists as the “brains” of the missile. The Atlas airborne digital computer was an amazing technological achievement of its time, the first all transistorized, all solid-state airborne digital computer, with no moving parts, and with unprecedented reliability and size.

Even less well known now is that both of these key ideas, the use of a digital computer and a gyroscopically stabilized platform to form an inertial guidance system for an ICBM originated with one man at one company from Long Island, NY. The Atlas airborne digital guidance computer and guidance system was conceived by American Bosch Arma’s star scientist of the 1950s, Wen Tsing Chow, of Arma Division, under whose guidance this system was successfully designed, developed and produced in quantity.

Wen Tsing Chow was born in 1919 in a small suburb of Shanghai, China, and in 1940 obtained his BS in Electrical Engineering from the prestigious Chiao-Tung University in Shanghai. He won a national competitive engineering prize that allowed him to immigrate to the United States in 1941 to study electrical engineering and conduct research at the Massachusetts Institute of Technology where he received his MSEE in 1942. He became a United States citizen in 1952.

Mr. Chow originally proposed to the Air Force a digital computer based all-inertial guidance system and established the basic design of the inertial guidance system for the Atlas ICBM in late 1954 and early 1955. His and Arma’s confidence was based on earlier research and development, originally sponsored by the Navy in the early 1950s. In particular, a 1951 study Mr. Chow had done for the Navy entitled “A Gimbal Control System for Maintaining Inertial or Horizontal Platform for a Maneuvering Vehicle,” describing a gyroscopically stabilized platform using two two-degree of freedom gyroscopes, became the basis of the Atlas system. Of course, when this was written, neither did gyroscopes nor accelerometers of sufficient accuracy and small enough size exist, nor did lightweight enough computers, digital or otherwise of sufficient reliability, size, and performance exist. But by 1954, Arma was ready to propose and build a completely digital airborne computer and guidance system based on these principles and found the vehicle for it in the Atlas ICBM.

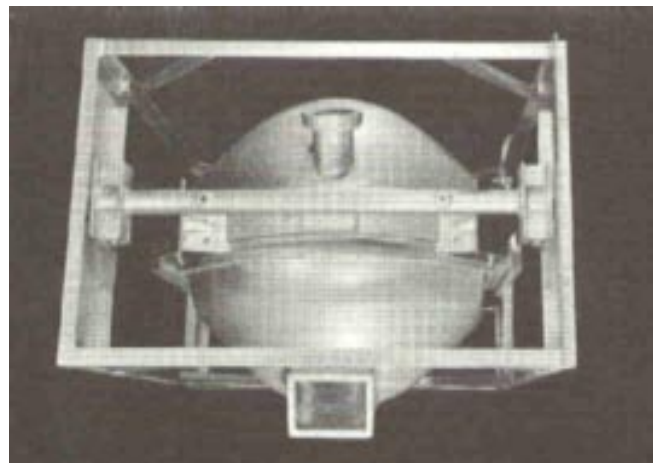
Mr. Chow frequently told that he was met with laughter and jokes when proposing and initially designing the digital computer for Atlas. As he used to relate, in one early AF presentation, a general interrupted him and said “well, Dr. Chow, that’s fine that you’ve figured out how to fit the (digital) computer into the missile, but where are you going to put the five Harvard professors you’ll need to keep it running!” provoking audience laughter.

All aspects of the proposed system were controversial and subjected to intense skepticism. The correct operation of the gyroscopically stabilized platform and accelerometers in the high vibration, high noise environment of an ICBM, that a digital computer powerful enough to perform the necessary computations could be made small enough and light enough to be a part of such a missile borne system, that a digital computer could ever be made reliable enough to survive and operate through an ICBM launch, the use of a truly inertial coordinate reference frame oriented towards the stars, and even that the approximating trigonometric expansions necessary to solve the guidance equations in the digital computer could be calculated with enough precision to meet the accuracy requirements. All these ideas, now rather obvious, were the subject of intense skepticism and controversy in the 1950s. As Mr. Chow said, his ideas had to “survive the most critical, prolonged, and punishing debate” to be realized.

Other key aspects of the Atlas/Arma guidance system, the Arma two-degree of freedom gyroscope and the Arma Vibrating String Accelerometer (invented by Mr. Chow’s friend and colleague Dr. Charles Bock), were so accurate the Soviets refused to believe such technology could exist and it was just an elaborate deception on our part. The vibrating string accelerometer was a 1955 invention of the Atlas program, after Arma began to

*The IGS Platform*

*(Continued on Page 5)*



**Atlas (Cont)** - work on the system to satisfy a critical need for an accelerometer with inherently digital output that eliminated the need for and inaccuracies and weight associated with analog to digital conversion electronics.

That it was Arma scientists and engineers that conceived, designed and actually produced the first successful such system should actually come as no surprise, given Arma's extensive history of designing and delivering high performance analog/mechanical and analog/electromechanical computer systems for US Navy submarines and warships before, during, and after World War II. These Arma analog computers, the Mk 1, 3, 4, 101, 102, and 106 fire control computers, as exemplified by the famed WWII Torpedo Data Computer also had to meet similar performance specifications, such as minimum space, weight, and power consumption, long periods of inactivity, followed unpredictably by the need for critical and highly reliable operation without immediately available maintenance time, personnel, or facilities. These characteristics also describe accurately a computer that must sit idle in a missile silo, perhaps for years until a critical moment, when it must perform perfectly. Key differences of course, are yet additional stress factors, and accuracy requirements of a missile computer that could not be endured and achieved with an analog design. AF missile accuracy specifications required the development and implementation of digital techniques that could survive the stress of an ICBM launch and flight.

The Atlas digital computer, a cube 2 ft. on each side, had over 36,000 discrete electronic components. Arma insisted on 100% testing of all operational components and had to sift through over a million discrete elements to get the 36,000 for every computer produced. The computer logic was built completely with discrete components, using diode arrays for the main computer program that implemented the guidance equations. Few manufacturers produced transistors that could meet the AF's and Arma's reliability specifications, forcing changes to semiconductor manufacturing processes throughout the nation. Arma consumed over 90% of General Electric's transistor production during the years of development and production of the Atlas computer.

One key invention associated with the Atlas computer was PROM, Programmable Read Only Memory, then called a "constants storage matrix." In the Atlas computer, the constants storage matrix stored the individual constants that parameterized the guidance equations based on launch and target locations. This invention, also by Mr. Chow, was at the direct request of the

AF to come up with a more flexible targeting system. A full diode matrix would be constructed and then certain diodes would be "burned out" by current overload, thus establishing a specific constant value in the computer's memory. This allowed for the target boards to be manufactured in large lots without advance knowledge of the guidance system constants or target and launch points. The constants were programmed in two locations, Arma facilities in Garden City, New York, and Strategic Air Command headquarters. In these locations were the first two PROM "burners." PROMs are one of the key inventions of the modern digital computer age and exist in all modern digital computer systems to this day.

The continued development and production of the Atlas airborne digital computer saw a number of other technical firsts, such as the invention and use of Triple Modular Redundancy, Dip Soldering, and the first "Clean Rooms" for manufacture of precision components. However, the most important success of this digital computer was to establish that airborne and missile borne digital computers were not only feasible but practical and producible, and thus digital computers became the basis for all missile and space computer systems that followed it. Had this computer failed, it would have set back America's missile and space programs by many years at a critical juncture in the Cold War.

Arma scientists continued the miniaturization and development of the Atlas computer throughout and after the Atlas missile program, working on miniaturized and "microminiaturized" versions of the existing production Atlas computer. The Arma computers MICRO-A/B/C, direct descendants of the original Atlas computer, were used in a number of other military and space programs in the early 1960s. These versions, architecturally similar to the original Atlas computer, incorporated the latest state of the art solid state technologies for memory, storage, processing, programming, reliability, and early integrated circuits.

The last versions of the Arma digital computer, the "MICRO-D/E" series designed in the mid to late 1960s, and now weighing less than 5 pounds, became the "brains" of the Litton LTN-51 INS (Inertial Navigation System) for use on the Boeing 707s and also the fuel control system on the Lockheed L-1011s, purchased by numerous airlines. Arma produced over 1400 of these MICRO-D and E computers for these aircraft systems, direct descendants of the original Atlas digital computer design.

Mr. Chow left Arma in 1964 to work for Aerospace Corp. in California and continued his guidance sys-

*(Continued on Page 6)*

**Atlas (Cont)** - tems and computer work for the AF in support of a number of Air Force and NASA programs including Minuteman, Titan, Saturn, Gemini, and several classified projects. In 1967, Mr. Chow went to work for IBM, working on the navigation systems and computers for the B-1 and B-52 bombers, Minutemen III, classified spacecraft, and also as scientific advisor to the IBM team for the Apollo program Saturn V guidance computer. Mr. Chow's final work with IBM in the early 1970s, before retiring from military aerospace and guidance work, was the design and development of the multiply redundant computer complex for the Space Shuttle.

American BoschArma Corp. would be swallowed up by United Technologies in the late 1970s, although by then it was just a shell of its former self and long out of the missile guidance business. Mr. Chow, following his early retirement in the late 1970s from avionics and computer work, became a managing director for the American Society of Mechanical Engineers, spending his time working on and worrying about issues related to American industrial competitiveness and decreasing investment in research and development. He did not stop working until the Cold War ended, and he finally was able to relax, satisfied and proud of his role in defeating the Communists. Mr. Chow would spend his retirement traveling and sailing his yacht. He passed away in 2001.

Mr. Chow traveled to many ICBM bases, both operational and under construction throughout the nation for a number of years during the 1950's and 1960's while working first for Arma, then Aerospace, and finally for IBM. **Any personal remembrances of Mr. Chow would be most welcome, as well as any knowledge of the whereabouts of any still existing artifacts or photographs of the Arma Atlas all-inertial guidance system, which appear now to be lost to time and secrecy. You can contact AAFM or the author directly, at dan@isinj.com.**

*Atlas Digital Computer*



**Crew R-01 (Cont)** - The crew was a mix of maintainers and operators led by Capt Russell Thresher. Although he attained the rank of Colonel before retiring, the crew still affectionately calls him "Cap'n T." They freely admit that they mean no disrespect to the rank which he earned. The nickname represents who he was to them at that time - their leader and mentor. Many admitted that the man, by handpicking them for his crew, made their careers, whether it culminated in the AF or out.

On Saturday, 14 Jun, the day began with a squadron mission brief given by the 576FLTS commander, then a short walking tour of the squadron's main facility. The group visited Missile Maintenance Operations Control (MMOC), the instrumentation and electronic labs, the countdown procedures trainer, and the Space Group's launch analysis section. The tour ended in front of the building before a pair of the squadron's heavy equipment - a transporter erector and a payload transport. While the group had interaction with only a limited number of squadron personnel, they were impressed right away. CMSgt (Ret) James Mustaine exclaimed, "These guys know their business!" Former Capt John Bailey (SSgt John Bailey on crew R-01) remarked that he'd probably have to have a PhD to be a staff sergeant in today's AF.

After lunch, the group was treated with a visit to their old working site. At the northern tip of 13th Street on Vandenberg, the old Atlas Site 576A is quietly being overtaken by rust and weeds. As the visitors gathered for a group photo, a familiar punishing and ceaseless wind had invited itself to our reunion.

Site 576A consists primarily of three launch pads and a buried control center. A lone gantry sits on pad 3, the other two gantries having been sold for scrap some time ago. The group was grateful to stand in its shadow once more. Stories of the pioneering days of ICBM operations abounded as memories flooded the members of the group. Countless hours usually turned into days as the crew was preparing for a launch. Twelve hour shifts were the minimum, and pad duty could last up to 5 days straight as a continuous string of glitches could pop up and had to be worked out of the system. MSgt (Ret) Paul Rodrigues pointed out a spot on the floor in the site supervisor's office where he used to take naps between tasks in order to keep going.

Most of the enlisted members of the crew moonlit with the company contracted to produce the technical orders (TOs) for operating and maintaining the new ICBM system. They'd work 12 hours on the pad, go write TOs for 5 hours, hit the enlisted club, get a few

*(Continued on Page 7)*

**Crew R-01** (Cont) - hours sleep, and start over again the next day. Ironically, then the same men who'd written the TOs out of uniform would be given them back when in uniform to validate. If they didn't work, they'd just rewrite them.

After crawling around the launch pad, the group was eager to visit the old control center. The abandoned blast doors swung free. The remains of a giant, intricate mural detailing all of the Atlas launches from the control center was faded and chipped away on the wall to the left of the control center entrance. A casual observer could easily miss it if the group hadn't pointed it out.

CMSgt (Ret) Roger Struxness, suffering from terminal illness, arrived that morning dependant on a wheelchair. His mobility had been suffering for some time. A renewed vigor overtook him as the bus unloaded at the control center. Forsaking his wheelchair, he eagerly entered the control center. Former SSgt Jerry Trent helped him down the main corridor. "This is memory lane we're walking down right here," he remarked. (See Letters)

There is no way to capture in words the experience these men had as they reentered the complex where they had not only observed history unfold, but in fact had made it. Before loading on the bus again, the group could not resist marking the whiteboard on the way out with their names. "The 'OLD' 576SMS crew was here," it read with their names and the names of the crewmembers who could not make it or had passed on.

As the bus departed the site, retired Chief Struxness asked me if he could share a story. I had the bus driver stop the bus, and the chief stood and turned to share his story. He recounted the time that Nikita Krushchev was passing through Vandenberg AFB by train. The Atlas crews fueled and loaded all three pads, rolled back the gantries, and made sure the ICBMs were venting evaporating liquid oxygen at exactly the time that the Russian Secretary General was passing by. His description of the event included the exact pressures and settings in order to create the venting effect. Other members of the group nodded their heads in agreement with the configuration and the recounting of the event.

The crew had another stealthy interaction with fame when President Kennedy wanted to view launch 134D. For five days straight, they toiled to make sure the missile was launch-ready, but at launch time instead of being the crew to push the button, they were told to stay in a broom closet in the basement because they hadn't shaved or showered in five days. Unsung, these men were the first silent demonstrators of deterrence.

Next, I took the group to one of the 576FLTS Minuteman III Launch Facilities. In designing the itinerary, I had wanted to bridge the gap from yesterday's ICBM operations to today's. While LF09 had not been there in their time, the group was familiar with the extreme Northern tip of base. When they had first arrived to Camp Cooke, there wasn't a single paved road on base. This spectacular part of the coastline was a place you could take your girlfriend in the 50's though.

That evening, the 576FLTS hosted the reunion group at an Alumni Dinner at the Vandenberg AFB Pacific Coast Club in the Warrior Room. Many recognized names and pictures of the first base commanders hanging on the walls. After much more reminiscing and swapping of stories between generations of missileers, the 576FLTS Commander stood and spoke, placing these men's contributions in historical perspective. A specially made video presentation then punctuated the evening in which old re-edited USAF historical footage of the first Atlas and its crews morphed into preparation and launch of a current Peacekeeper missile. "Proud Heritage...Bright Future" was the motto. The familiar mists of Vandenberg rolled into the men's eyes as they saw themselves in the grainy footage, in their "missile whites," once again young. It was a truly special evening.

On 16 Jun, a second day of touring began on South Vandenberg at the 2nd Space Launch Squadron - the unit currently charged with the Atlas mission. Capt Dan Wetmore presented a mission brief which tied into the theme of the reunion beautifully. Tracing how the Atlas mission ended up with the 2SLS, he also touched on the Atlas' future. During question-and-answer, I was once again astounded at the level of detailed technical knowledge that these men retained.

After the mission brief, the 2SLS treated the group to a tour of the control centers and then a tour of the Titan II launch pad, where the last Titan II stands ready for flight. We were able to go up the gantry and see the interstage as well as the first stage engine. It's amazing how much has not changed in 40 years. The Titan II's serial number began with 66-, denoting the year of manufacture, another reminder to the crew of the innovative work their generation had begun.

After a reminiscing lunch in the site dining facility, we traveled to the Base Heritage Museum where Jay Prichard treated the group to stories as well as vintage Atlas consoles and an Atlas engine. The knowledge these men have in their heads is invaluable to the preservation of ICBM heritage. MSgt (Ret) Dale Urhammer took one look at the Atlas engine

(Continued on Page 8)



*Dale Urhammer and the Atlas Engine*

**Crew R-01** (Cont) - and spent over a half an hour checking it out. Having been a missile engine specialist, this was the exact hardware that he had maintained in the early 60's. He felt right at home crawling in the nozzle and around the injectors, spouting off the specifications. Upon departure, his wife asked him if he wanted to give the engine one last caress before they left. He did.

The second day of touring came to a close at Site D0, the 576FLTS Minuteman III REACT-B configured Missile Alert Facility (MAF). I gave the group an overview of the life of current missile operators and the personnel who man the MAF. We then went down to the Launch Control Center (LCC) to view the "state-of-the-art" Rapid Execution and Combat Targeting (REACT) console. It was an apropos bookend to the volumes of ICBM history.

When asked, Col Thresher agreed that the men and women of the 576FLTS today are continuing the great tradition which his crew started. "Now you have TOs and the expertise to use them. That's a lot more than we had." Throughout their visit, many of us ICBM youths could not resist asking these men what it was like at the beginning. MSgt (Ret) Paul Rodrigues had observed, "We worked so hard and had so much fun, we didn't know we were making history." They now know...and so do I.

Most of the crew will be keeping their ears open for the launch of the last Atlas from Vandenberg. While they may not be able to link up again, at least some of the first crew to launch an Atlas may yet view the final flight.

## **341SMW QC Reunion**

Early members of the 341SMW maintenance Quality Control division had a reunion at Malmstrom in July. AAFM Treasurer Bob Kelchner, one of the attendees, said the group met for two days and had superb support from the members of the 341st Space Wing.

## **548SMS - First Reunion - By Tom**

*Musson, mbrno A2148, Alexandria, VA*

Another early ICBM unit had its first reunion during August. The 548th Strategic Missile Squadron (ICBM-Atlas), an Atlas E unit, became operational in October 1961 at Forbes AFB, Topeka, KS, and was part of a significant Strategic Air Command presence at the eastern Kansas base. Based on the number of assigned personnel at that time, Forbes AFB was the second largest base in SAC. In addition to the 548SMS, Forbes was home to the 21st Strategic Aerospace Division, the 55th Strategic Reconnaissance Wing (RB-47s and KC-97s), and the 40th Bomb Wing (B-47s and KC-97s).

Over 38 years after the deactivation of the 548SMS in early 1965, 66 former members, the widow and daughter of a member and about 50 spouses and guests of members gathered in Topeka on the Labor Day weekend, 27-31 August. Registration started in the early afternoon on Wednesday the 27th. Thursday morning a tour of the facilities and aircraft of the 190th Air Refueling Wing (Kansas ANG) that is based on an enclave of the former Forbes AFB, (Forbes Field is now a commercial airport). Following the tour a picnic was held at Lake Shawnee. Along with the Friday site tours a box lunch was held in a quiet park in Burlingame, Kansas. Burlingame is located about half way between the locations of the missile sites and made a good meeting point for the busses traveling to the opposite location. Saturday we had a morning tour of site 9 (Jackson Heights High School), the afternoon was left open for us to do our own thing. A reunion dinner was held on Saturday, with the guest speaker being Col (Ret) Charlie Simpson, AAFM's Executive Director. He reviewed significant events in the history of the ICBM force and related some of his own contacts during his Air Force years with missileers who served as members of the 548SMS. Many of the members said their final goodbyes at a Sunday morning buffet breakfast in the hotel.

Some of the memories relived during the reunion concerned the squadron's early years when the United States had a small ICBM force which played an important role in our nation's defense during those "high tension" years. Training classes at Sheppard AFB and Vandenberg AFB, and acceptance of the missile sites from contractors were all discussed. The squadron's activities during the Cuban Missile Crisis in October 1962, the assassination of President Kennedy in November 1963, and other crises periods of the early 1960s were also major topics of conversation.

*(Continued on Page 9)*

**548SMS** (Cont) - For one period, the 548SMS was the location for an evaluation of various helicopter types proposed for use in supporting the Air Force ICBM units. During this evaluation, missile combat crews flew to their assigned sites in H-19, H-21, H-43, or Army HU-1 helicopters. The Minuteman ICBM wings eventually received an improved version of the HU-1.

Besides renewing old acquaintances and reliving memories, the highlight for the former SAC missileers was the tour of four of the nine Atlas E coffin-style missile sites that comprised the squadron. While two of the sites were not significantly modified from their demilitarized condition, one (site 6 at Keene) has had significant upgrades and modifications, converting the underground Launch Operations Building into a modern residence. The unique features of this underground home have been described in numerous newspaper and magazine articles. The site has also been featured on the Home and Garden Television Network. Another site (site 9 at Holton) has been modified into a modern building for the Jackson Heights High School. The high school, with classroom space in both the Launch Operations Building and the Launch and Service Building, has integrated many site features into the school complex. A brilliant red, white, and blue scheme is used on the long site tunnel and provides a highlight for the students moving between their classes. The Atlas E missileers were impressed not only by the excellent use of the ex-missile site by the school district, but also by the numerous records established by the school and proudly displayed in the banner-lined gymnasium.

The Topeka area welcomed the returning missileers both individually and through press coverage. The Topeka Capital Journal newspaper had a crew accompany the missileers and their wives for some of the site tours, and a French film crew accompanied other members for the tour of site 6.

One unexpected event in the hospitality suite was the visit by a former member of the 385th Bomb Group (Heavy) of World War II who had heard about the reunion. The 385BG flew B-17's from Great Ashfield Air



548SMS Site Tour

Base in Suffolk, England from June 1943 to August 1945. The Group included four bomb squadrons, the 548th, 549th, 550th, and 551st. All four squadrons eventually provided heritage to strategic missile squadrons of the 1960s.

The major effort to plan and conduct the reunion fell on the shoulders of one squadron member. The organizer of the event, Don Peoples, began contacting squadron members in 2001. Gathering copies of orders as he contacted old squadron mates, Don was able to identify over 800 former members of the squadron. Working on the Internet he was able to develop good contact information for 360 people. Since the 548SMS was one of the early missile squadrons, 59 members of the squadron were identified as deceased, while others had health issues that kept them from attending the reunion.

As part of the reunion, the former members of the squadron completed the organization of the 548SMS Association. Don Peoples was elected as the "Commander" of the association. He will be assisted by Stan Bieleski who will be his Deputy. Jack Roberts will be organizing and publishing the association newsletter. Warren Shane will become the association treasurer. At the conclusion of the very successful reunion, tentative plans were made to meet again in 2006, perhaps at the AAFM National Meeting.

## One Plus One.....Keep Helping AAFM Grow!

We began our "One Plus One" project last October at our National Meeting - we ask each member to find one other missileer who hasn't joined us yet - and to bring one more missileer with you to Omaha in 2004!

**See the special incentive on Page 12**

**Contact AAFM if you need brochures - or download an application at [www.afmissileers.org](http://www.afmissileers.org)**

## **The IG is Coming - Part I** - by Col (Ret)

*Charlie Simpson, AAFM Executive Director.*

***This is the first of a series of articles and stories about inspections, evaluations, tests and exercises that missileers have been involved with "forever." Send in your personal stories to add to those we already have for the future issues of our newsletter.***

The IG. The Inspector General. The Black Hats. SMES. The 3901st. MSET. NSI. CAFI. NATO Tac Eval. Phase One. Phase Two. No Notice. Eval. Compliance Inspection. Disaster Preparedness Exercise. Base Appearance Inspection. And lots more.....

All of us have gone through a variety of inspections, evaluations, tests and exercises - not just as missileers, but in every specialty that we worked in - and those of you who are still serving still live with it. Over the years, some of the techniques, procedures and evaluation and inspection methods have changed, but the basic purpose hasn't. All of these activities are designed to ensure that the units we were in could accomplish both their wartime and peacetime missions. Many of us served on both sides - we were the evaluators and we got evaluated. And we all remember the old saw "I am the IG and I am here to help you."

I don't know anything about the inspections that early Matador, Mace, Thor and Jupiter units experienced, but I learned early about SAC Operational Readiness Inspections (ORI). Those of us who served in the early Atlas and Titan I units went through many IG visits. Most units failed numerous times, which just meant a return of the dreaded "IG Team" in a few more weeks - at least in less than six months. They called the first visit a "Practice ORI" - no penalty for failing, they said. And we all failed the first one in those early systems. Our squadron at Mountain Home was one of the few units to pass an IG during our short lifetime - we even passed a second time - right before we began phasing out the system.

In those days, the ORI was no-notice - we weren't supposed to know when the IG would come. We followed his travels closely - we knew when another unit got hit and knew we weren't far behind. Because we had new missile systems, the teams that came were a combination of folks from Headquarters, SAC, the numbered Air Force (15AF in our case) and the new 3901st Strategic Missile Evaluation Squadron. The 3901SMES members also came back for their own evaluations, so we got to know them pretty well. They were also the real experts - not always true of the other team members.

It usually started with a call from the command post with the statement, "There are two C-97s inbound with a total of 125 souls on board - it may be the IG." We weren't allowed to jump the gun, so we took no action until the team actually showed up at the door. We recalled everyone in the unit and went on 24 hour operation. IG team members immediately went to the three sites and conducted simulated launch countdowns, and it seemed they were inspectors everywhere.

We began preparing our nine missiles for lox-only countdowns. To pass the ORI, at least six of the nine missiles had to successfully complete lox loading, be raised topside and complete the guidance phase of simulated missile flight. I kept a big scoreboard in Job Control, where I worked - and we had lots of red missiles on our scoreboard. The old Titan I was complex and not very reliable - I think we failed three ORIs before finally passing the first in 1964. The preparation process was long and involved. Maintenance teams had to download the RP-1 into the storage tank, remove the ordnance and put in simulators, and install TV cameras in the silo, equipment terminal and topside. It took several days to go through all the missiles, and as each one was ready for exercise, the IG team would observe the launch countdown sequence.

During all this work, there were inspectors everywhere in the squadron looking at procedures, records, and facilities. One of the inspectors I saw often was then Major Bill Sands, who was then a maintenance evaluator. He would later, as a colonel, command the 3901SMES, and his son Jim, also a Colonel, recently retired after being the commander at Buckley AFB. The IG not only looked at how we went to war - they checked us for physical fitness, made sure we were good housekeepers and followed every AF and SAC regulation and manual to the letter. While it was a great relief when they outbriefed and departed, it left us with a lot of work getting those nine missiles back on alert. Then we had to start fixing all the problems that they had identified, answer the write-ups in the report - and get ready for the next one that would be in a few months.

During the next couple of issues, we will look at inspections and evaluations throughout the life of our missile systems. We already have several personal tales from members that will be part of this series - and all of you have stories to tell. Look for more - how it was in NATO, what life was like as an evaluator, humorous write-ups and more in future issues of your newsletter. Send in your stories now.

## TAC Missileers Reunion - by Robert

*Bolton, mbrnoA1119, Tac Missileers Newsletter Editor*

The Tac Missileers had a successful reunion in Denver 17-22 June, with 181 members and 143 spouses attending. All had a great time. Smiles, hugs, hand shakes and more than a few tears were evident during the entire get-together. Many conversations started off just as they were left off in Orlando at the last meeting. A lot of folks that were in attendance in Orlando didn't get to make the good times in Denver but, we certainly had a good showing from men we had not seen before at any of the other gatherings. Thanks to Terry Akre for ferreting out the Embassy Suites at the Denver Tech Center, it was an excellent choice for our venue this year. The hotel facilities and staff were fantastic. Tremendously accommodating and supportive of our group and our activities. I haven't received a single complaint about anything relating to the hotel or staff. Of course, the gratis afternoon food and booze and the lavish complimentary breakfast only reinforced the good location, good times and service.

Congratulations to Julian Esposito for the long and difficult task he undertook in getting the Schuhplattler dance group lined up to entertain us during Friday's Oktoberfest, they were a fun bunch and got a group of the Missileers and their ladies involved in the show before it was over. The dancers really set the German atmosphere for the evening. A number of missileers were gutsy enough and still slim enough to show up in their lederhosen, many of the ladies wore their dirndl and a few of the other guys added to the overall spirit by wearing their German hats sporting the hiking pin collections from their days in Germany. The authentic German fare was enjoyed, as evident by the plates being piled high with sauerbraten, bratwurst, potato salad and red cabbage. Capping off the fest was a nice selection of deserts and coffee. A cash bar kept things well lubricated through out the late evening. Although not all of the Missileers present served in Germany, accounts were given that everyone got into the spirit and had a good time. During the evening our Oktoberfest King and Queen were named, past Secretary Bob Conrad in his authentic lederhosen with all the accoutrements looked the part. While Hilde Stewart as the perfect Queen in her impressive dirndl.

Saturday's semiformal banquet went off very well also. One and all looked sharp and cleaned up real well for the evening. Everyone enjoy their personal preference of either prime rib roast, chicken or fish with



*The Belleview Park missile*

each selection being accompanied by a complementing side assortment. Following the meal raffle tickets were drawn for a number of nice prizes. Each Missileer in attendance received a stainless steel coffee cup, emblazoned with our TAC MISSILEERS badge and the phrase USAF SERVED WITH PRIDE. The bus tours were all packed and enjoyed. Each of the groups take pleasure in the attractions of the Thursday gambling excursion, the Friday Air Force Academy tour and the Saturday Coors brewery tour. Early Saturday a large number of the reunion participants met at the Mace Missile at Belleview Park.

The TAC Missileers will meet again in the summer of 2005, with the location to be announced this fall.

**Convince a Member who has not attended one of our National Meetings to join us in Omaha and get a new AAFM Coin - See Page 12**

## Reunions

**390SMW (Titan II)**, Tucson, AZ, 29 Sept-3 Oct 2004, Tucson, contact the Lashers at elainelasher@aol.com.

**Association of Air Force Missileers**, 19-23 May 2004, Marriott Regency, Omaha, NE, see back page for registration form

**556SMS**, 18-22 April 2004, San Antonio, TX Sheraton Four Points, contact Fred Crytzer, wfc@stic.net or 210-679-6542

**45th Anniversary, First Vandenberg Launch**, 16 December 2003, launch of the first Thor from SLC-2, contact The Boeing Company, Attn- Eric Lemmon, Mail Code SLC-2 Bldg 1628, PO Box 5219, Vandenberg AFB, CA 93437-0219, e-mail Eric.G.Lemmon@Boeing.com.

## Altus Museum

The Museum of the Western Prairie is developing a new exhibit on the Atlas program and its impact on the local area. The focal point of the Atlas exhibit will be a launch console from one of the Altus silos. A mock "Launch Control Center" will be constructed around this centerpiece. Any organizations or individuals interested in supporting the Atlas exhibit are invited to contact the museum. Contributors will be recognized within the exhibit. The Museum of the Western Prairie is located at 1100 Memorial Drive in Altus. The hours of operation are Tuesday through Saturday from 9:00 AM to 5:00 PM. Admission is free. Please contact AAFM or call 580-482-1044 for more information, or e-mail [muswestpr@okhistory.mus.ok.us](mailto:muswestpr@okhistory.mus.ok.us).

## Books for Missileers

I picked up two books during the Cold War History Conference in Washington that will be of interest to members. Both are available at bookstores and on-line.

"At Work in the Fields of the Bomb" by Robert Del Tredici, was published in 1987 and features black and white photos and text about nuclear weapons, including photos from Ellsworth and Vandenberg.

"Face to Face with the Bomb" by Paul Shambroom is a recently work featuring color photos of the current nuclear force, with about 25 pages of color photos from Warren, Ellsworth, Whiteman, Minot and Vandenberg, along with bomber and cruise missile photos.

## Cold War History

AAFM president Jay Kelley, board members Bob Parker and Bob Kehler and Charlie Simpson attended a conference in September hosted by the Woodrow Wilson Foundation and cosponsored by AAFM. The conference including panels on a variety of subjects relating to the history of the Cold War. More than 50 attendees included authors, museum directors and representatives from the services and other government agencies. The purpose of the conference was to develop a clearing house for Cold War History projects.

Of special interest for missileers were presentations by the National Park Service on the Minuteman Historic Site and a review of the AF Museum's plan for the new "Hall of Missiles". Assistant Secretary of the Department of the Interior Craig Manson, who served on a missile crew at Ellsworth in the late 1970s, opened the conference. He had attended the transfer ceremony last year when the Air Force turned the Ellsworth LF and LCF over to the Park Service.

## Omaha in 2004 - One Plus One

One of the initiatives developed at the 2002 National Meeting was our "One Plus One" effort - asking each member to find one other missileer to join AAFM, and to convince one member to attend the 2004 National Meeting in Omaha. As a special incentive to members, if you convince a member who has never attended one of our National Meetings to join us next May, we will award you one of AAFM's new Association Coins - in design now and available next May. This special coin will be available for all members for a donation - but you can get yours free. Just have the first-time attendee note your name in the block at the bottom of the registration form telling us that you convinced him or her to attend. And get your own registration in the mail today. Our Sixth National Meeting will be a great gathering.

## Taps for Missileers

LtCol (Ret) James Cwiak, served in the 341SMW 1975-1979, worked at Lockheed Martin and lived in Colorado Springs.

LtCol (Ret) Oscar J. Sundstrom, first commander of the 51MMS at Vandenberg, lived in Oklahoma City

Major (Ret) James E. Kornreich, was in Minuteman Ops and ALCS in the 44SMW, maintenance in the 341SMW, at Offutt with the ABNCP, and GLCM at Dugway and the 868TMTG, and a life member of the GLCM Foundation, lived in Tucson

Maj Jim Broyles, served in the 341SW and the 1st Space Control Squadron and lived in Colorado Springs.

Col (Ret) Bruce Harger, served in Minuteman in the 44SMW, 90SMW and 341SMW, at Hq SAC, Hq USAFE in GLCM and is Space in the 6595TW in Titan III and lived in Springfield, MO.

LtCol (Ret) Hubert Spraberry, served in Minuteman in the 445/91SMW and the 321SMW and lived in Brownwood, TX

Col (Ret) Ralph Dowell, an AAFM Member, commanded the 3901SMES and 44SMW and served in the 549SMS, 2AF and 1STRAD, lived in Eugene, OR

1Lt Paul Monaghan, an AAFM Member, was in the 91SW at Minot

TSgt (Ret) Paul Lackey, an AAFM Member, served in the 556SMS, 381SMW, 394SMS, 395SMS and 1STRAD and lived in Richmond, VA

CMSgt (Ret) Roger Struxness, a member of 576SMS Crew R-01, lived in Highland, CA (See Page 1 story)