AFTAC

A Nuclear Data User

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R&D Materials Portfolio Manager

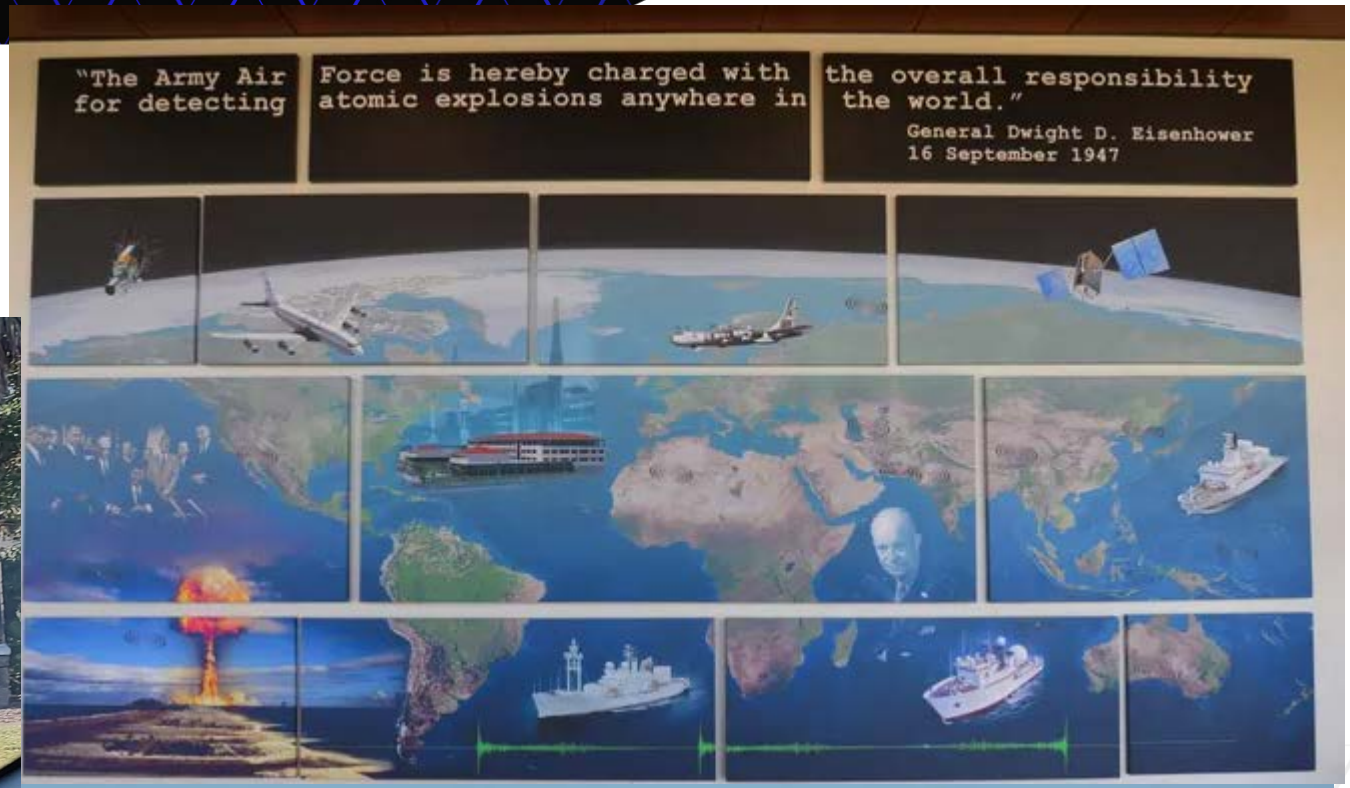
Air Force Technical Applications Center (AFTAC)
Patrick Space Force Base, Florida

- Located less than 30 miles south of the Kennedy Space Center
- An Air Force wing-equivalent center that provides national authorities quality technical measurements to preserve our nation's security
  - Monitor nuclear treaty compliance through detection of nuclear events
  - Develop advanced proliferation detection technologies
- Comprised of 2 Groups, 7 Squadrons, 4 Directorates, 10 Detachments, and 5 Operating Locations
  - Equates to over 1000 personnel both military and civilian who operate on all seven continents
  - Highly educated force - 203 associate degrees, 215 bachelor's degrees, 262 master's degrees and 67 doctorate degrees in numerous disciplines
  - Many of the higher degrees are the proud accomplishment of enlisted airmen

AFTAC's first mission - long range nuclear detection

- End of World War II, Gen. Dwight D. Eisenhower directed the Army Air Force to develop technologies capable of detecting "atomic explosions anywhere in the world."
  - Two days after the General's direction, the US Congress created the US Air Force
  - Task came under the Air Force Office of Atomic Testing (AFOAT)
  - Created and established a system of sensors and assets - acoustic, seismic, and radiological
  - Called the US Atomic Energy Detection System (USAEDS)
- USAEDS registered its first victory in 1949
  - A particulate sampler aboard an Air Weather Service modified B-29 flying between Alaska and Japan collected debris
  - The Navy collected and analyzed rain water
  - Acoustic records helped AFOAT-1 determine that the Soviet Union had conducted its first test

AFTAC – HQ – PSFB, FL



AFTAC – A Secret?

- AFOAT-1/AFTAC operated for decades
  - No one without a high security clearance and only those with a clear "need to know" were aware that AFOAT-1 was detecting nuclear tests
  - 1975 the Air Force admitted AFTAC had responsibility for operating the USAEDS
- Over time, AFTAC's various programs evolved into a unique resource
  - System monitoring compliance with nuclear treaties
  - Supporting our nation's space program
  - Helping to protect citizens during emergencies involving nuclear materials
  - Asset in Homeland Security for potential RDD or IND incidents

AFTAC – Treaty Monitoring

- **AFTAC provides direct technical, analytical and evaluative support to the IAEA and International community with Treaty Monitoring**
  - **The Nonproliferation Treaty**
    - **Prevent the spread of nuclear weapons, promote arms control and disarmament, and promote peaceful cooperation in nuclear energy**
  - **Monitors compliance with the 1963 Limited Test Ban Treaty**
    - **Prohibits nuclear testing anywhere but underground**
    - **Prohibits the venting of nuclear debris or radiation from those tests into the atmosphere outside the country's national borders.**
  - **Monitors compliance with the Threshold Test Ban Treaty of 1974**
    - **Limits the size of underground nuclear tests to 150 kilotons**
  - **Monitors compliance with the Peaceful Nuclear Explosion Treaty of 1976**
    - **Prohibits the testing of nuclear devices outside of agreed treaty sites**
  - **Works closely with the Comprehensive Test Ban Treaty Organization**
    - **Improving the International Monitoring System**

AFTAC – 24 hrs/day - 365 days/yr support

- Air Force tasked to conduct short-notice collection operations
  - April 1986, AFTAC responded to the Ukrainian nuclear accident at the Chernobyl
    - AFTAC flew 55 sorties compiling 502 flying hours
    - AFTAC's McClellan Central Laboratory processed 354 samples and logged more than 2,500 man-hours
  - March 2011, AFTAC directly supported Operation Tomodachi, Fukushima Power Plant disaster
    - AFTAC flew 9 sorties and analyzed 660 samples
    - Processed 342 seismic events
  - October 2006, AFTAC detected an event in North Korea
    - Claim of nuclear test was verified and subsequently AFTAC has monitored and collected against North Koreas further testing

AFTAC – Technological Leader

- Leading edge of technological research and the evaluation of verification technologies for current and future treaties involving weapons of mass destruction
  - AFTAC manages 11 world-class laboratories to assist the IAEA
    - In 2014, AFTAC supplemented its extensive network of contracted laboratories by opening its state-of-the-art Ciambrone Radiochemistry Lab
    - Analyzes and assesses samples from the USAEDS and AFTAC's Nuclear Debris Collection and Analysis Program
  - USAEDS now contains over 3,600 sensors globally
    - After 9/11, established an array of sensors across the US, as part of the National Technical Nuclear Forensics (NTNF) program
    - Aid the Federal Bureau of Investigation in attributing attacks on U.S. soil to foreign governments or terrorist entities
    - Protect U.S. personnel and interests from the threat of a domestic nuclear detonation

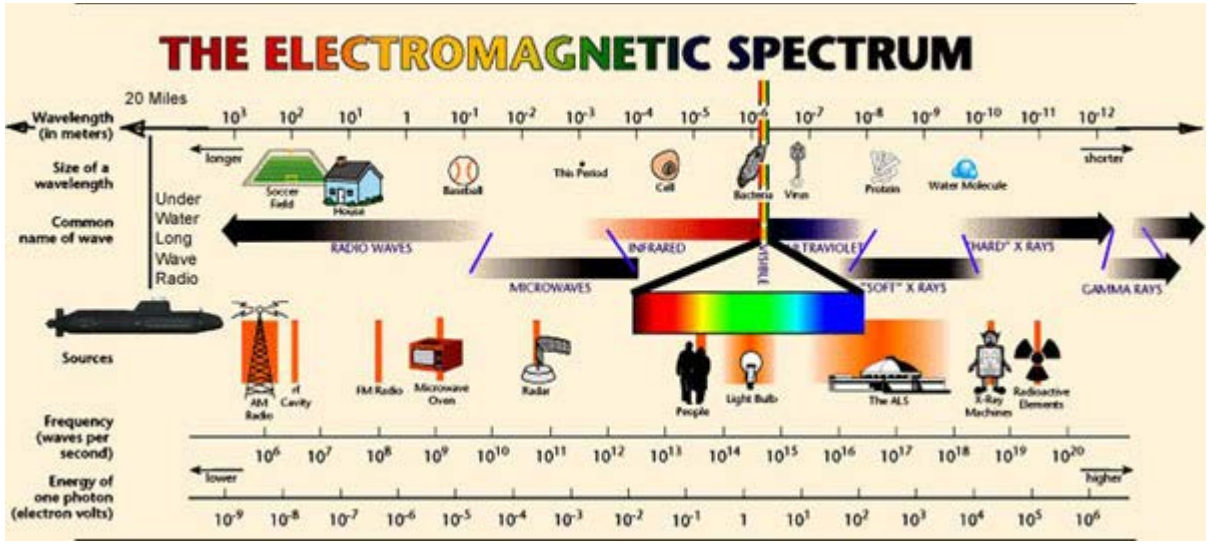
AFTAC – Special Equipment

- Air Force use various aircraft that collect particulate and gaseous effluents and debris from accessible regions of the atmosphere
  - WC-135s (Boeing 707, circa 1960) are the workhorse aircraft used by AFTAC due to range and altitude capabilities
  - Operate in solely open air space
- AFTAC leads the onboard operations team aboard the USNS Howard O. Lorenzen and USNS Invincible
  - Operated by Military Sealift Command through a support agreement with the U.S. Air Force
  - S and X-Band radar provides unique, high quality, high resolution, multi-wavelength radar products
  - Integrated surveillance and ballistic missile data collection platform to support U.S. nuclear treaty monitoring activities
  - Monitoring of U.S. or foreign space, missile, or weapons test events that may pose potential hazards or threats to air or surface navigation

AFTAC - Systems

AFTAC – Where's WANDA fit in?

- Where doesn't it?



- Treaty Monitoring of Nuclear Events, Processes, and Non-Proliferation require excellent nuclear data
- Better fidelity of data
  - As measurements improve –quality of results improve
- Specific needs are discussed with our Agency partners and National Labs
  - Used as proposal reviewers

AFTAC – Thanks you for your efforts

Questions