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Ions and betas and treaties, oh my!

By Susan A. Romano, AFTAC Public Affairs

PATRICK AIR FORCE BASE, Fla. – In a world filled with uncertainty and growing concerns about the global proliferation of nuclear weaponry, there is one organization in the Department of Defense dedicated to identifying debris from possible atomic explosions and analyzing the findings for national decision makers.



The Ciambrone Radiochemistry Laboratory, which opened its doors at Patrick Air Force Base in March 2014, is the sole DoD laboratory dedicated to the analysis of radioactive debris.

The 38,000 square foot facility is manned by scientists of varying backgrounds – chemists, physicists, nuclear engineers, radiation safety – and their primary focus is simple: determine if effluents from a potential nuclear explosion are present in environmental samples collected globally by AFTAC personnel.

Simple, yes, but not always easy. It takes a team of highly skilled, technically adept experts to operate high purity germanium, x-ray and gamma-ray detectors, alpha and beta radiation monitoring systems, mass spectrometers and precision analytical chemistry equipment.

Lt. Col. James J. Thomas, director of lab operations for the Air Force Technical Applications Center and trained physicist himself, leads nearly 60 CRL personnel who support the nation's critical nuclear treaty monitoring mission.

“Our senior leaders rely on our network of labs to assess compliance with nuclear weapons testing in support of the U.S. Atomic Energy Detections System, as well as AFTAC’s Nuclear Debris Collection and Analysis Program,” said Thomas. “Our lab professionals identify radiological or nuclear debris collected from air or ground samples to ensure signatories are complying with established treaties like the Limited Test Ban Treaty.”

The lab was named after Col. Thomas Ciambrone, a career Air Force officer who spent 20 of his 30 active duty years with the nuclear treaty monitoring center. The lab became operational in March 2014 when AFTAC moved into its new \$158 million facility. Establishing the Ciambrone Lab at Patrick AFB filled a void created when the center’s central laboratory at McClellan AFB, Calif., closed after the 1995 Base Realignment and Closure actions.

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“From 1995 until 2014, AFTAC had to rely solely on another contracted lab to conduct the NDC&A mission,” said Thomas. “Most, if not all, military leaders don’t relish the idea of a single point of failure. In 2011, one of our contracted labs had to evacuate due to a major natural disaster, and that lab’s operations had to be temporarily suspended. Time becomes an issue, especially when we’re dealing with radioactive decay and the importance of preserving perishable evidence. That’s why it was so important for us to have this redundancy.”



The lab has stringent rules, regulations and safety precautions it must take to ensure its environment is free of impurities. It’s vital to their mission.

“Much like a court trial, nations require definitive evidence before accusing another nation of violating a provision of a treaty,” said Thomas. “In some circumstances, the only unambiguous evidence of a treaty violation may be trace amounts of radioactive debris. In these cases, laboratory analysis is required to confirm the presence of nuclear materials from an explosion and distinguish them from naturally-occurring radioactive materials, or releases from peaceful uses of nuclear materials such as medical facilities or nuclear power plants.”

He added, “Because of this critical need and role, our laboratory must be ready at any given time. It is extremely important that samples are rigorously processed and protected from contamination with the environment after being collected. CRL’s environment needs to be free of impurities and pollutants such as dust, particles and vapors that may contain natural radioactivity. Lab personnel take several steps and precautions to ensure the laboratory maintains its pristine atmosphere.”

Thomas, a 2001 Air Force Officer Training School graduate, credits his success and the success of the lab directly to the men and women he works with each and every day.

“I brag on my folks as often as I can because they’re that good,” Thomas said. “We affectionately call each other The Lab Rats, and we’re very proud of the brand we’ve created for ourselves. Morale in our work center is extremely high and everyone goes the extra mile for one another – not just on the job, but also off duty. People look out for each other, and a leader can’t ask for much more than that. It’s like the old saying, ‘Take care of the people, and the people will take care of the mission.’ It certainly is the case here at Ciambrome.”

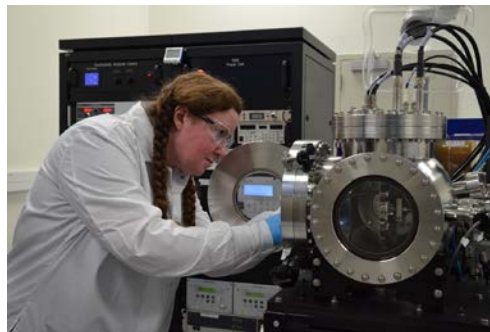
When asked what his leadership philosophy is, Thomas took no time answering. “It’s so important to lead from the front – always. I will do anything that I ask the men and women of the lab to do. I’ve learned that if you are too big for the small jobs, then you’re probably too small for the big jobs.”

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While the Ciambrone Lab is not a squadron, per se, its structure mirrors that of a typical squadron found throughout the Air Force. Gen. David L. Goldfein, Air Force Chief of Staff, referred to squadrons as the “beating heart of the Air Force” and the “engines of innovation and esprit de corps” where standards are set, excellence is fostered and healthy work environments are cultivated.



“We have five branches within the lab that are very similar to flights found in a squadron,” explained Thomas. “Our radiochemistry branch and mass spectrometry branches isolate specific elements brought to the lab. This allows them to remove the relatively large amount of radioactivity from the samples and identify the tiniest amount of nuclear debris. The measurements branch uses high purity germanium detectors and other alpha/beta detectors to capture the radioactivity levels in each sample. Our operations branch analyzes the data and produces a report to NDC&A customers to provide germane information to senior leaders and our higher headquarters. And the support branch makes up the ‘unsung heroes’ of the lab – the folks who keep operations flowing smoothly from personnel issues to computer networks.”

A squadron is also considered to be the USAF’s most basic unit that’s responsible for vital, day-to-day operations. The Ciambrone Radiochemistry Lab certainly meets those criteria. And CRL’s contributions to AFTAC’s nuclear treaty monitoring mission continue to impress the center’s commander.

“The technical analysis performed by the men and women of the Ciambrone lab provides the evidence used and scrutinized at the highest levels of government, often with great urgency,” said Col. Steven M. Gorski, AFTAC commander. “I am continually impressed with the level of expertise and degree of proficiency these scientists and technicians display on a daily basis. We recruit the best of the best in the field of radiochemistry, and that shows in the superior work they perform for our national decision makers.”