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Air Force removes nuclear excess from Alaska

Seven radioisotope thermoelectric generators are lined up aboard an Air Force C-17 Globemaster III after being removed from Burnt Mountain, Alaska, and transported to Creech AFB, Nevada, July 24, 2015, in preparation for permanent disposal at the Nevada National Security Site. The RTGs, which contain nuclear material, were once used as a power source for the Air Force Technical Applications Center's seismic array, which monitors seismic activity in the region. The RTGs were replaced with a hybrid power source. (U.S. Air Force photo by Susan A. Romano)

by Susan A. Romano
AFTAC Public Affairs

7/31/2015 - **EIELSON AIR FORCE BASE, Alaska** -- The Air Force Technical Applications Center, headquartered at Patrick AFB, Fla., removed excess nuclear material from one of the center's seismic arrays on Burnt Mountain, Alaska, and transferred it to a repository at the Nevada National Security Site after nearly 15 years of inoperability.

Ten radioisotope thermoelectric generators, or RTGs, were used as a power source by AFTAC at its array 60 miles north of the Arctic Circle. Originally placed on Burnt Mountain in 1973, the first RTG was installed to power a single seismometer. Twelve years later, due to the increase in communications equipment and demand for additional power, nine more RTGs were placed at the site.

For the next 17 years, the RTGs were operated and maintained by AFTAC's Detachment 460 based at Eielson AFB near Fairbanks, and were used because of their high reliability and low maintenance requirements to determine if regional seismic activity was caused by nuclear explosions or naturally-occurring events such as earthquakes, mining explosions, volcanic activity, etc. AFTAC's primary mission is to verify compliance with nuclear test ban treaties.

But in 1992, a tundra fire encroached on the Burnt Mountain site and damaged some of the data cables. Despite the fact the fire did not impact the generators themselves, it raised public concern among nearby inhabitants about the safety of using radioactive material as a power source at the station.

The Air Force, in coordination with multiple agencies and mission partners, made the decision to remove the RTGs and relocate them to NNSS. By regulation, radioactive material determined to be excess must be moved to a facility with a mission, capability and authorization to support long-term storage or recycling of the material. NNSS fits that bill.

Each thermoelectric generator contains between one to three pounds of a radioactive material called strontium-90. The material is about the size of a hockey puck and is securely contained in a vessel with an inner shield made of tungsten inner and a cast iron protective housing, weighing approximately 4,000 pounds.

After two years of planning and a dry run in the summer of 2013, relocation operations began July 14 and were based out of Eielson AFB. Personnel from AFTAC's Florida headquarters, Alaska's Det 460, the Air Force Inspection Agency, the Air Force Radioisotope Committee, Air Force Radiological Disposal, Nuclear Regulatory Commission and Sandia National Laboratories formed the cadre that ferried the RTGs from Burnt Mountain to Eielson via U.S. Army helicopters based at Fort Wainwright in Fairbanks.

Each day, two CH-47 Chinook helicopters transported the crew from Wainwright to Burnt Mountain. The chinooks were chosen because of their heavy lift capabilities. A single CH-47 is able to transport 33 troops and their gear, or three pallets of cargo, or a single sling load, or a combination of the three up to 26,000 pounds.

The 10 RTGs were located at five different sites within four miles of each other. Much of the terrain was rocky, pitched and covered in heavy brush, making movement somewhat challenging. At two of the sites, the crew had to lay several yards of modular interlocking surfacing to help shore up the ground as the RTGs were transferred to the helicopters.

"One of the toughest aspects of this entire operation was working in the rugged terrain amidst challenging Alaska weather," said Scott Lattimer, project manager for the relocation. "Those things, coupled with I-track set-up, tear-down and transport made several of the days a bit demanding."

Once the generators were loaded on the helos and secured for transport, the cadre returned to Eielson, where the RTGs were temporarily stored until all 10 could be relocated to Nevada.

On day three of the operation, the crew hit a significant snag when one of the Det 460 members, who was

driving a 6-wheel utility vehicle, became impaled on a 29-inch long, three-quarter-inch thick branch. The branch speared the staff sergeant deeply in his upper thigh as he drove over extremely rugged terrain in very poor weather conditions. The extent of his injury required him to be medically evacuated via one of the two available Chinooks to Fairbanks Memorial Hospital. (Editor's Note: Surgeons successfully removed the impalement and the Airman is on the road to recovery; he was released from the hospital within days and was present in the hangar when the final RTGs landed at Eielson.)

"The doctors from Fairbanks said the crew did a phenomenal job stabilizing the patient," said Joy Morris, AFTAC's radiation safety officer. "They were really impressed with their on-scene first aid actions and the fact that the responders had the wherewithal to not remove the impalement from the injured NCO, while simultaneously keeping him calm."

After hurdling the safety incident, the mission continued. Army Staff Sgt. Matthew Patterson was the senior flight engineer from B Company, 1-52 Aviation Brigade at Ft. Wainwright. As the eyes and ears in the rear of the aircraft, he was responsible for providing the muscle that handled and oversaw the sensitive cargo, ensured the safety of the passengers and served as the vital communications link to the pilot. This transport was Patterson's first with radiologic material.

"I've flown to Burnt Mountain a handful of times, but this mission required a lot more training and awareness around the nuclear materials," he said. "Our biggest challenge wasn't necessarily the cargo or the many moving parts; the weather became the predominant issue we had to overcome. That, and the very rugged terrain at some of the mountain sites."

When the helos returned to Eielson each day, the pallets were quickly downloaded with fork lifts operated by the 354th Logistics Readiness Squadron.

Tech. Sgt. Rebecca Morin, 354th LRS noncommissioned officer in charge of air terminal operations, was impressed with the organization and fluidity of the RTG removal.

"Out of all the operations I've been a part of during my career, this is one of the best I've ever seen," said Morin. "It was obvious that a lot of solid planning went into this mission. We had a few communications obstacles at first, but with so many hands and agencies in the mix, you kind of prepare yourself for that and overcome it as quickly possible to get the job done."

She added, "This was the first time my team and I have worked around nuclear materials. I'm proud of the hard work by Tech. Sgt. (Brian) Ashton, Staff Sgt. (Rebecca) Bartlett and Staff Sgt. (Michael) Berglin. Teamwork is definitely the number one key to mission success."

Once all the RTGs were recovered and shuttled to Eielson, a C-17 Globemaster III was dispatched to the base for transport from Alaska to Nevada.

Gradually, each pallet carrying one RTG was forklifted onto a K-loader - a heavy equipment transporter capable of offloading/onloading equipment from military aircraft -- until all 10 were safely strapped down into the Globemaster. The C-17, which was based out of Joint Base Elmendorf-Richardson in Anchorage, then flew to Creech AFB, Nevada, northwest of Las Vegas.

The RTGs were loaded onto ground vehicles and driven to NNSS, where they were accepted by personnel from the Department of Energy for official disposal at NNSS.

"This was, from start to finish, a 100 percent team effort," said Col. Jonathan VanNoord, on-site commander and AFTAC's Director of Operations. "To move the largest non-weapons grade nuclear material in the Air Force inventory was an incredibly intricate and complicated mission, requiring detailed planning and precise mission execution. Despite Staff Sgt. (Richard) Northey's unfortunate accident and some weather challenges in Alaska, the mission was a complete success and everyone who participated in the RTG transfer should be extremely proud of the role they played."