February 2007, Issue 123

SITES

The New Nevada Test Site: How will it change day-to-day operations?

A collaborative effort among both federal and contractor staff is designed to transform the way business is conducted at the Nevada Test Site (NTS). Dubbed the *New Test Site*, this ongoing initiative will transform operations in numerous ways.

One key element of the *New Test Site* is the proposed transition of large scale hydrodynamic (hydro) testing to the NTS, which will reduce costs by consolidating this kind of high explosive testing at one facility.

Here, a depiction of a hydro test taking place at Los Alamos National Laboratory. The "New Test Site" initiative aims to bring hydro testing, which involves radiography, to the NTS.

An advisory committee including some of the nation's premier nuclear weapons experts is advising National Security Technologies, LLC (NSTec) on how the company, working with the National Nuclear Security Administration (NNSA), can bring a more dynamic experimental capability to the NTS.

"This kind of capability includes radiography, hydrodynamic testing, and diagnostics, which give us the ability to provide more complete data to the national laboratories," says **Jim Holt**, Director, Defense Experimentation and Stockpile Stewardship for NSTec. "The labs validate the computer codes that help execute these tests, which in turn, can uncover certain problems in the stockpile. That way, experts will be able to certify weapons with a higher degree of confidence than we do today."

The tests involve no fission or fusion processes. In other words, the plutonium is not "going nuclear." Instead, it's being pounded by chemical explosives to simulate a nuclear reaction so scientists can determine how it might perform in a real world scenario.

Hydro testing is part of the certification process to ensure the reliability of the nuclear stockpile. It involves radiography, which produces x-ray images of plutonium and other surrogate materials as they are compressed by high explosives.

Diagnostics accurately measure properties of the high explosives and compress surrogate materials. When used in conjunction with computer modeling, experts can determine how the aging nuclear stockpile may react under certain conditions.

In small scale experiments, weapon components are studied to obtain a better grasp of all the intricate processes that occur when a weapon is detonated. Weapons systems include high explosives, special nuclear material, and plastics — essentially everything from screws to tubes.

"We are getting fundamental data that can be measured from a real-world perspective," explains Holt. "This includes data on as much of the integrated system as possible, as well as the individual components."

Small-scale experiments provide fundamental data that allows computer models to be extrapolated to weapons conditions. For example, the plutonium involved in these experiments is usually no bigger than a few inches in diameter. Consequently, data results must be adjusted back to actual size and mass.

Besides acquiring data in a more comprehensive fashion, another key element of the New Test Site emphasizes a collaborative effort among all the contributors, including federal, contractor, and laboratory staff.

The initiative aligns with Complex 2030, the NNSA's aggressive plan to streamline the nuclear weapons complex and increase efficiency.

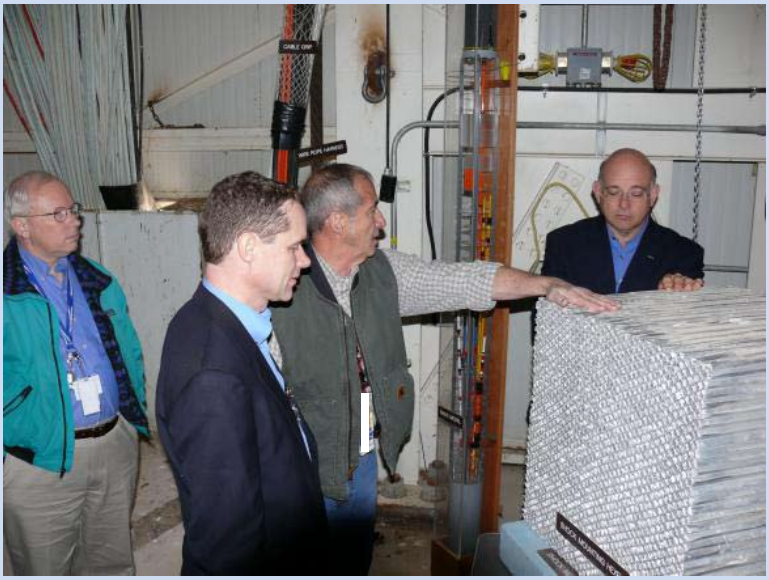
"A more comprehensive experimental capability at the NTS will help bring the integrated solutions to the forefront that the NNSA needs to achieve its vision of Complex 2030," says **Debbie Monette**, NNSA's Assistant Manager for National Security.

In This Issue

Energetic staff make Northrop Grumman tour a success

Last November, Northrop Grumman senior management, including Chairman and Chief Executive Officer Dr. Ron Sugar, paid a visit to the NTS. They toured a number of key areas, including Icecap, and the Nonproliferation Test and Evaluation Complex. Additonally, they toured the U1a Complex, an underground laboratory where experiments supporting the nation's nuclear stockpile are conducted.

"The effort that went into coordinating all of the required services and activities for this tour were outstanding and the positive support dedicated to this visit was greatly appreciated," says NSTec President **Steve Younger**.



Chuck Costa *(center) briefs (from left to right)* **Steve Younger**, **Wes Bush**, *and* **Ron Sugar** *on the finer points of Icecap. The underground nuclear test was originally planned for 1993 and halted due to the 1992 moratorium on testing.*

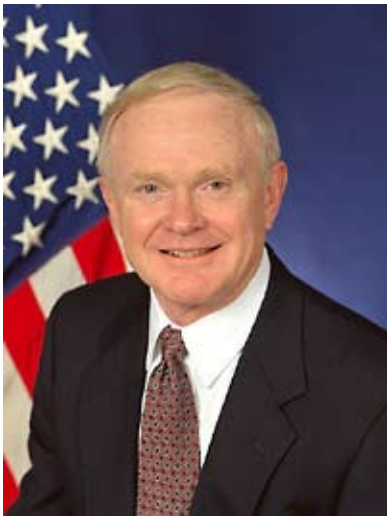
Educational outreach stimulates love of science

Imagine a place where science meets young inquisitive minds. Where children can see and hear astronauts speak about the International Space Station, the space shuttle, and space exploration.

The students and teachers participating in the 16th Annual Regional Science Bowl are going beyond mere imagination. Roy D. Bridges, Jr., a former National Aeronautics and Space Administration (NASA) astronaut and pilot of a 1985 Space Shuttle Challenger mission, will serve as the luncheon keynote speaker.

"I flew on the Challenger for eight days and 126 orbits around the earth. That experience was just awesome," says Bridges. "I was preparing to fly again on the Challenger when the accident happened in 1986. It was a very heartfelt tragedy, and it changed all of our lives."

Bridges became the Director of John F. Kennedy Space Center in March of 1997, where he was responsible for managing NASA's only site for the processing and launch of the Space Shuttle vehicle; processing the payloads flown on both the shuttle and expendable launch vehicles; and overseeing the acquisition and launch of expendable launch vehicles carrying NASA payloads. He was also responsible for the final integration, test, and processing of the elements of the new International Space Station and payloads going to the station on the Shuttle. He managed a team of about 2,000 NASA civil servants and about 14,000 contractor employees.



Roy D. Bridges, Jr.
U.S. Air Force Major General, Ret.

Bridges says his fond memories of flying started at a very early age. "Growing up, I wanted a life that was more of an adventure than the average. I remember hearing a news flash on a car radio about the launch of Sputnik and hearing President Kennedy's challenge to America to be the first to the moon, and I thought, 'What an exciting time to be alive,'" exclaims Bridges.

A retired U.S. Air Force Major General, Bridges also served as Director of NASA's Langley Research Center in Hampton, Va. He is currently the Director of Operations for Northrop Grumman Technical Services in Herndon, Va. He and his wife Benita reside in Williamsburg, Va.

Experts analyze how seismic activity could effect the DAF structure

The Device Assembly Facility (DAF) serves the critical function of providing a safe and secure facility to support nuclear explosive operations, subcritical experiments, and other national security programs. It is vital, therefore, that the facility and its equipment can withstand the shaking that could be caused by a potential earthquake.

In October 2006, two types of seismic measurements were made around the DAF; this occurred as part of the facility's seismic hazard analysis (SHA).

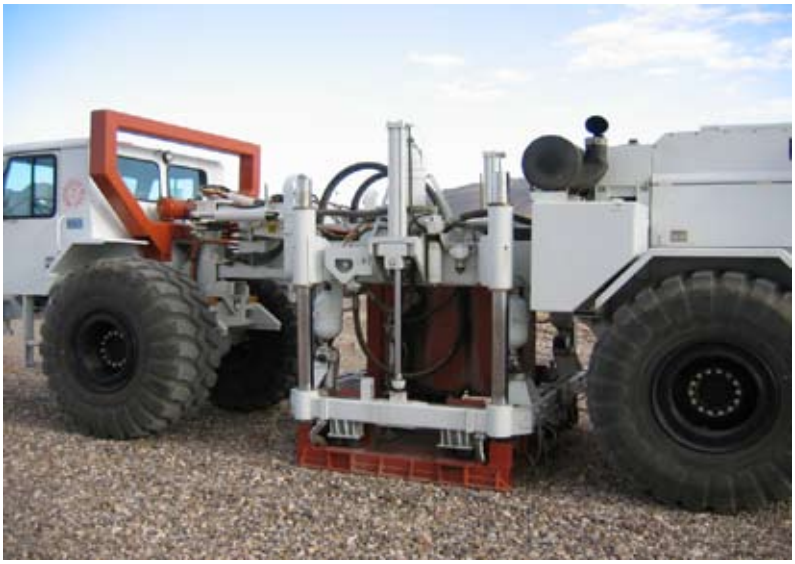
The analysis predicts how large an earthquake could potentially occur within a certain time frame; it also helps to determine how the earth materials at DAF and the structure itself would respond to such an earthquake.

Ultimately, experts will model the seismic properties of the alluvium (soil) under the DAF and produce an updated SHA. A seismic study will then be used by scientists at Lawrence Livermore National Laboratory (LLNL) and Los Alamos National Laboratory (LANL) to predict the DAF's structural response to ground motions. When complete, the analysis will be used to evaluate and qualify all safety-related systems, structures, components, equipment, and equipment anchorages in the DAF against the updated seismic hazard.

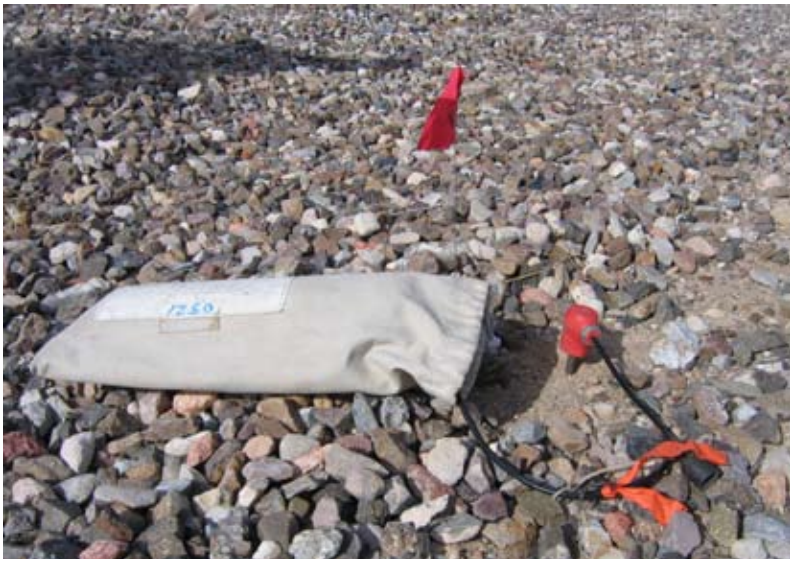
LLNL contracted with Geomatrix Consultants to prepare the seismic analysis for DAF. In a joint effort by LLNL, Geomatrix, and NSTec, geologic information for the DAF area was compiled and analyzed to aid in the understanding of the area geology. Further, the tests help determine how the alluvium on which the DAF is built might potentially react to an earthquake.

However, the measurements revealed that more precise information on the seismic characteristics of the alluvium under the DAF was needed for the required calculations. This type of information can be acquired by drilling holes to obtain samples for laboratory tests.

Drilling was considered, but **Dennis Kelly**, LLNL DAF Manager, and **Dr. Quazi Hossain**, Co-Director of the LLNL Hazards Mitigation Center, decided, based on recommendations by Geomatrix, to use non-intrusive seismic methods to obtain the data.



The Liquidator produces vibrations in the ground. Scientists monitor these readings to gather information on the seismic properties of the soil.



When a series of geophones such as these are placed on the ground, they measure the time it takes a seismic impulse to travel through the soil. This gives experts key information for the Seismic Hazard Analysis.

"We selected surface seismic methods over drilling because the seismic surveys can be conducted at a significantly lower cost and with less impact on DAF operations and security," said Dr. Hossain. The two methods employed—seismic analysis of surface waves (SASW) and refraction microtremor analysis (ReMi)—provided detailed information without drilling.

In both methods, vibrations are produced in the ground by various sources (typically hammer blows, vibrating equipment, or explosives). One source is a large thumper or shaker truck, known as Liquidator, which is used to generate the required vibrations, which are picked up on geophones. These sensors transform seismic energy into an electrical voltage.

When a series of geophones is placed on the ground, it is possible to measure the time it takes a seismic impulse to travel through the earth from geophone to geophone. This provides information on the seismic properties of the alluvium.

Before the seismic surveys started, field tests were made to verify that the vibrations generated by Liquidator would not damage DAF equipment. NSTec personnel coordinated all NTS safety and security training and support required by field crews from the University of Nevada, Reno, and the University of Texas. They also collaborated with DAF Operations and Security and Wackenhut Services Inc. to keep them abreast of daily activities and movements in and around the compound.

How did NSTec garner the Best-in-Class Award for its monitoring program?

Under the NSTec AMSI program, and in conjunction with Burge Environmental in Tempe, Ariz., a system was developed to monitor environmental contaminants in the field. In this case, the field was the Columbia River.

At a section of the Hanford Site in Washington, a groundwater plume of hexavalent chromium (metallic element used to harden steel alloy) is discharging into the Columbia River through the gravels beds used by spawning salmon. This chemical is toxic to aquatic ecosystems; of special concern are the juvenile stages of salmon using the river's gravel beds as spawning habitat. To evaluate exposure risk for aquatic receptors, key data on the element is needed from a variety of river environment locations, and at a greater frequency than with traditional monitoring methods.

The monitoring system calibrates, analyzes, and performs quality control checks and also allows for the use of a variety of different sensors, depending on the area of interest. The system can detect the element at very small parts per billon and analyses can be completed at any time of the day or night, during any season, regardless of weather, at as small as 15-minute intervals. At the completion of each analysis, analytical results are sent via wireless modem to the operator's computer, which eliminates the six-week laboratory turn-around time.

The system, in continuous use since June 2004, was first tested at the NTS and then on location at the Columbia River in Washington; the evaluation included tests under a variety of temperature extremes and weather conditions.

The competition encourages, promotes, and highlights achievements in pollution prevention throughout the Department of Energy (DOE) Complex.

To nominate an individual or team for 2007 for the award, contact Al Karns at (702) 295-5689.

"We were impressed with how well the system ran as well as the customer satisfaction that resulted."

Awards demonstrate NSO's knack with pollution prevention

Editor's Note: SiteLines will feature each award separately in upcoming issues.

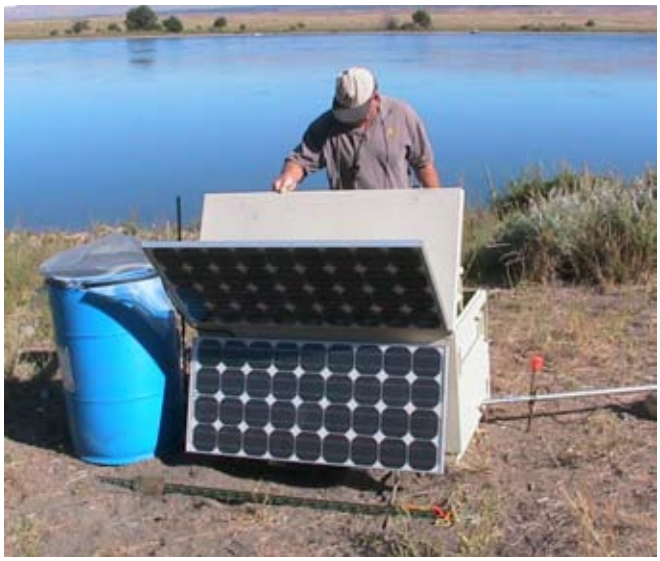
Recently, Nevada Site Office (NSO) employees submitted 10 nominations for the national NNSA Pollution Prevention Awards Program and scored big by doing so.

Nevada received two Best-In-Class awards and two Environmental Stewardship Awards.**

This article focuses on the Best-In-Class award garnered by the NSTec Advanced Systems Monitoring Initiative (ASMI) for its project, "Monitoring Hexavalent Chromium on the Columbia River." **Charles Lohrstorfer**, Manager of Environmental Technical Services, **Carmen Fannin**, and **Dr. Rick Venedam**, Program Manager, Nonproliferation Test & Evaluation, were honored

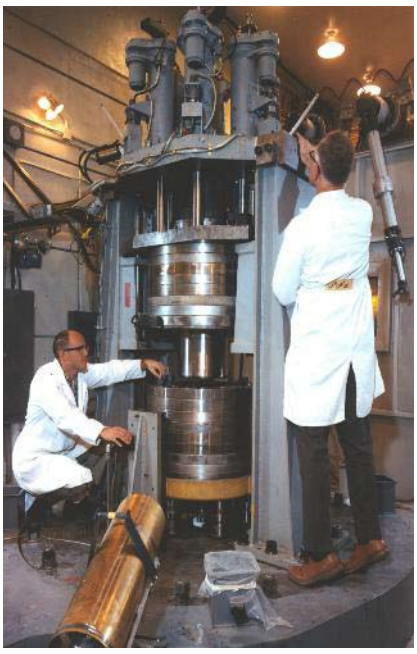
"We were impressed with how well the system ran as well as the customer satisfaction that resulted," says **Lohrstorfer.**

From left to right, NSTec team members instrumental in this award are **Dr. Rick Venedam**, **Carmin Fannin**, *senior opertions specialist, and* **Charles Lohrstorfer**.



The complete sensor unit in relation to a human.

It's a bird ... it's a plane ... It's Super K!



Super Kukla reactor being prepared for next test.

Clean up of the Super Kukla facility is underway at the Nevada Test Site, leaving behind the legacy it played during the Cold War.

Constructed in 1964, its mission was to determine how an enemy countermeasure would affect the performance of a nuclear warhead during a weaponry exchange.

The key component to the Super Kukla facility was the reactor, which provided the environment to bombard materials (placed inside) with radiation in the form of intense bursts of neutrons and gamma waves. Following the facility's closure in the late 1970s, the reactor core was disassembled. Decontamination and decommissioning activities were conducted on three of the four structures – the Reactor Building, Reactor High-Bay, and Mechanical Building. The entire two-acre facility was then fenced to protect workers and the environment until a more comprehensive cleanup could be accomplished.

Twenty-five years later, Environmental Management contractors representing the Stoller-Navarro Joint Venture (SNJV) with support from NSTec, began conducting extensive site research and characterization activities which led to the development of a plan to close the site to eliminate or reduce risks to human health and the environment.

SNJV is accomplishing cleanup in the following six phases:

- Prepared the site by installing temporary power, an office trailer, lighting, and ventilation.
- Collected samples (such as concrete and paint chips) and conducted radiological surveys, health and safety swipes, and air monitoring. In addition, the material and debris in each building was inventoried.
- Established data quality objectives and developed a plan to close the facility in place.
- Removed polychlorinated biphenyls (PCB) and non-PCB oils, lead and mercury components, asbestos, and other hazardous materials as necessary. In this phase, debris from the Mechanical Building and the Wooden Shed was placed into the Reactor Building for entombment in a later phase.
- The Mechanical Building and the Reactor High Bay were demolished down to the slab, and the Wooden Shed was completely removed since there is no concrete slab. After the three buildings were demolished and disposed, samples were taken and surveys were performed on the remaining slabs.
- The Reactor Building will be entombed with grout. Super Kukla will be the first Decontamination and Decommissioning site to be entombed in place with use restrictions. All sumps, the Basement Reactor Room, and the Access Tunnel will be included in this process. In addition, the surrounding vicinity will be graded to ensure that any possible surface water will flow away from the area. The final part of this phase is to apply appropriate use restrictions to the area.

Field work at Super Kukla is scheduled to be completed in March 2007. The final closure report is due to the State of Nevada in September 2007.

This aerial view of Super Kukla shows the Reactor High Bay, Mechanical Building, Access Tunnel Entrance and Wooden Shed.

Who regulates Industrial Sites?

Super Kukla, an Industrial Sites clean-up project, is regulated by the Federal Facility Agreement and Consent Order. Documents proposing the clean-up strategy for each Industrial Site are prepared by the Nevada Site Office and submitted to the Nevada Division of Environmental Protection (NDEP) for approval. When the documents are scheduled for submittal, a public notice is posted to the Nevada Site Office Internet website at http://www.nv.doe.gov/emprograms/environment/restoration/ffaco.htm. Additional information on the Federal Facility Agreement and Consent Order can be obtained by visiting the NDEP Internet website at http://ndep.nv.gov/BOFF/ffco.htm.

Emergency training puts responders to the ultimate test

There was a large explosion at a nearby casino. There were at least 13 dead and an unknown number injured. Emergency responders arrived on-scene and established an Incident Command System (ICS) and control around the perimeter of the accident area. The call goes out preceded by—"This is a drill!" The next time, however, it might not be a drill, and the exercise helps ensure readiness.

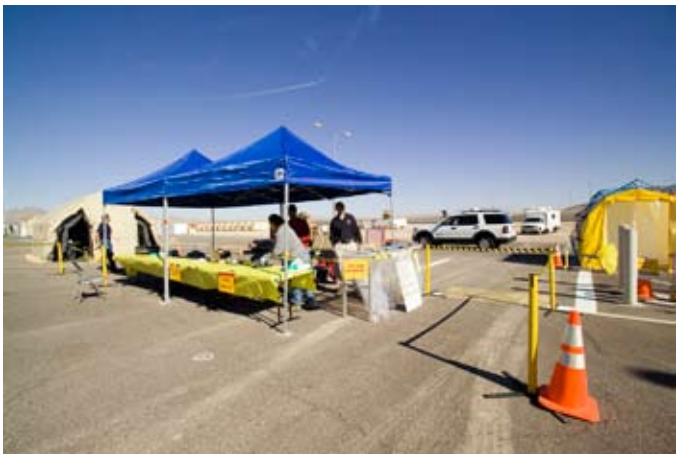
The Capstone 2006 drill scenario ran from noon on Nov. 15, 2006, to 5 p.m. Nov. 16, 2006, and was the culmination of the week-long Capstone training course (see sidebar) offered by the National Nuclear Security Administration (NNSA) to the Consequence Management Community. This community includes staff from the National Nuclear Security Administration (NNSA), the national labs, the Remote Sensing Laboratory (RSL), as well as state and local emergency responders.

During the event, the Hazardous Materials (HAZMAT) team from the local fire department identified gamma radioactive contamination scattered through the area. Based on the blast damage, the estimate was that 2,000 to 3,000 pounds of high explosives (HE) had been detonated.

The Governor's office requested federal assistance from the National Nuclear Security Administration (NNSA), notifying agency representatives **Roger Thompson** and **Colleen O'Laughlin**. Thompson acted as the Federal Radiological Monitoring and Assessment Center (FRMAC) Director, while O'Laughlin became the Unified Command Controller.

To assist in the drill, the NNSA quickly deployed a number of teams, whose members include employees from the federal agency and contractors, including NSTec. Team names give a good indication of how the roles performed in the drill and include the Consequence Management Response Team (CMRT) and Aerial Measuring System (AMS) standby teams.

NSTec employee **Rhonda Hopkins**, NSTec Radiological Emergency Response Department Manager, performed as Liaison Controller. She noted that "the drill was a fantastic opportunity to work on the integration of the FRMAC with state and local Incident Command. NNSA invited personnel from the states of Georgia, California, and Nevada. It simulated the level of interaction and made specific state requests of the trainees. This is a great way to train and prepares us to respond during a real radiological emergency."



Sample receipt/contamination control line personnel wait for field teams to return with samples to be surveyed. On the left is where the samples are dropped off. Center is the hot line to survey the people for contamination and on the right is the shower, if needed, for contaminated personnel.

Face-to-Face

Christy Sloop

Company: Navarro (SNJV)

Title: Scientist II

Hometown: Las Vegas, Nev.

Hobbies: Playing with her 2-year-old daughter, swimming, singing.

Christy believes her most significant contribution to the company so far is her attention to detail. This commitment helps her to create quality Preliminary Assessment Summaries. Through the years, Christy has learned not to sweat the small stuff. If she could have any job she wanted, she would be a zoologist or paleontologist. Most people wouldn't know that Christy someday plans to retire in Paris.

Face-to-Face

Carson Riland

Company: NSTec

Title: RSL Chief Scientist

Hometown: Sunbury, Penn.

Hobbies: Watching old movies, tinkering around the house (car maintenance, home improvement, etc.), teaching at UNLV and "coaching" students and young professionals.

Carson believes that his most significant contribution to the company has been participating in the National Emergency Response teams. This experience strengthens and increases his team focus. Carson thinks he has the best job he could have. Most people wouldn't know Carson was once a disc jockey.

Unfortunately, you could you be at risk of losing all or part of your sight.

Two leading causes of "low vision" and blindness are Age-related Macular Degeneration (AMD) and glaucoma. While these diseases both primarily impact older individuals, anyone can be at risk. Macular degeneration is the leading cause of legal blindness in people 65 years and older in the United States, affecting more than 10 million Americans, according to the National Eye Institute. Glaucoma impacts more than 2 million Americans over the age of 40 and there are possibly 65 million suspected cases worldwide.

What is AMD?

The retina of the eye is the specialized nerve layer that perceives light, which is transmitted via the optic nerve to the brain so that we can "see." The macula is the small, central area in the retina. The disease process in AMD attacks the macula resulting in loss of our central vision. There is no cure for AMD but there are treatments available. Prevention and early detection, however, remain critical.

What causes AMD?

The exact causes are not known. The following factors may put some individuals at higher risk for developing macular degeneration:

- Smoking
- High blood pressure
- Exposure to harmful sunlight
- Poor diet
- Advanced age – the risk increases at 50 and increases with advancing age
- Gender – AMD is more common in women than men
- Race – AMD is more common in Caucasians
- Eye color – AMD is more common in people with blue eyes
- Severe farsightedness
- Genetics – a positive family history of AMD increases your risk

What is glaucoma?

Glaucoma is a disease of the optic nerve – the part of the eye that carries images to the brain. Damage to the optic nerve is manifested by the development of "blind spots," which may initially go unnoticed until the damage is extensive enough to cause significant vision loss. Most individuals are unaware of this eye disease that can cause loss of peripheral vision and even total blindness if not recognized and treated early. There is no cure for glaucoma, but there are effective treatments if the disorder is recognized before permanent damage occurs.

What causes glaucoma?

The clear liquid within the eye is called "aqueous humor" and it is being produced at a constant rate. If there is a blockage of this drainage process, increased pressure within the eyeball can result and can lead to optic nerve damage.

What is considered "regular screening" for glaucoma?

According to the American Academy of Ophthalmology the following frequency schedule is recommended.

- Age 20-29: Every three to five years for individuals of African descent or with a family history of glaucoma.
- Age 30-39: Every two to four years with risk factors listed above.
- Age 40-64: Every two to four years for all individuals.
- Age 65 or older: Every one to two years for all individuals.

What is considered "regular screening" for AMD?

The American Academy of Ophthalmology encourages everyone over 50 to see an ophthalmologist for a dilated examination every 1-2 years.

For more information, go to the following Websites: www.preventblindness.org or info@preventblindness.org. Call Occupational Medicine provider **Karen Sondrol Maxwell** at **(702) 295-1474**, with any questions.

The following acronyms appear frequently in SiteLines:

BEEF	Big Explosives Experimental Facility
CTOS	Counter Terrorism Operations Support
DAF	Device Assembly Facility
DOE	Department of Energy
EM	Emergency Management
EM	Environmental Management
ES&H	Environment, Safety, and Health
FRMAC	Federal Radiological Monitoring and Assessment Center
JASPER	Joint Actinide Shock Physics Experimental Research (gas gun)
LANL	Los Alamos National Laboratory
LLNL	Lawrence Livermore National Laboratory
NNSA	National Nuclear Security Administration
NSO	Nevada Site Office
NSTec	National Security Technologies, LLC
NTS	Nevada Test Site
PIP	Process Improvement Project
R-MAD	Reactor Maintenance, Assembly, and Disassembly Facility
RSL-A	Remote Sensing Laboratory - Andrews
RSL-N	Remote Sensing Laboratory - Nellis
SC	NNSA Service Center
SCE	Subcritical Experiment
SNJV	Stoller-Navarro Joint Venture
SNL	Sandia National Laboratories
STL	Special Technologies Laboratory
WSI-NV	Wackenhut Services Inc. - Nevada

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Milestones

Desert Research Institute
15 years John Gardner, Walter Shingles

Los Alamos National Laboratory
5 years Anthony Bodin

National Security Technologies, LLC
35 years Kenneth Cooke

30 years Ruben McDaniel, Tony Salinas

25 years Joy Burk, Teresa Fortner, Arlin Houser, Pamela Jackson, William Kreitlow, David Lory, Craig Lyons, Terry McCowan, Laureen Shay, Bridget Ward-Christian

20 years Jana Halas, Kevin McCamish, Frank Mutz, Julius Robinson

15 years Terry Royder

5 years Griselda Aguirre-Sayno, James Arnett, Chauncey Davis, Cheryl Furjanic, Jon Gallardo, Ruben Guzman, Paul Hawkins, Tracy Hill, LeeAnn Inadomi, Kurt Jahn, David Lunder, Stephen Mitchell, Eric Moore, Andrew Ortega, Henry Pazos, Marvin Preston, James Reilly, Eduardo Rodriguez, Anita Ross, Lance Strandboge, Monte Warrington, Glen Watson

NNSA/NSO
30 years Darrel McPherson

20 years Edwin Martinez

Team CNSI
10 years Michael Owens

New Hires
Ronald Asuncion, Mary Bentley, Christina Brescia, Timothy Echelard, Matthew Fickle, Carrie Fitzgerald, Arnold Fowkes, William Friedlander, Gwendolyn Gardner, Richard Gale, Jennifer Hendrickson, Michael Hendrickson, Elizabeth Hepburn, Lory Jones, Deborah Lee, Alonso Martinez, Phillip Molzen, Donald Russell, Keven Shoemaker, Gillian Silver-Rodis, Harvey Smith, Stephanie Stumpo, Michael Taylor, Robin Tobin-Lopez, Gustavo Villanueva

In Memory

Deceased Former Employees

Betty Elliott
Malcolm Kennedy
Mary Shafer-Lutz
Charles Lytle
David Newsom
Edward Weaver

Retirees

Max Dolenc, NSTec
Mark Koeller, WSI
Lilyann Moore, WSI
Cletus Pierce, NSTec
Larry Rose, WSI
John Ross, WSI
Liberato Sandoval, NSTec
Maxwell Taylor, NSTec

Calendar of Events

February 19
NNSA/NSO and contractor offices closed in observance of President's Day.

March 20
NTS Public Tour, open the public. Sedan Crater, Frenchman Flat, Non-Proliferation Test and Evaluation Complex, Bilby Crater, Area 5 Low-level Radioactive Waste Management Site, Apple II houses. Contact **Brenda Carter, NSTec**, at **(702) 295-0944**.