Accomplishments and Look-Ahead

June:

- ATR NSUF User Week 2009 was held June 1-5, 2009. Over 100 total registrants participated in workshops, courses, research forums and tours. See full report below.
- University of California, Santa Barbara (UCSB) specimens were loaded at UCSB and supported by INL quality assurance personnel the week of June 24. The loaded holders were shipped and received at INL on June 29. According to UCSB PI Dr. Bob Odette, the loading "went together very nicely in the last three very long days", and he complimented the INL on their assistance during the process.
- University of Illinois (UI) specimens were provided by Carolyn Tomchik, a UI student on Monday morning June 29. Holders were loaded, and laser welded for the first 5 capsules needed to support insertion during the first irradiation cycle.
- Joy Rempe presented the paper, "New Sensors for In-Pile Testing at the ATR NSUF," at the Advancements in Nuclear Instrumentation, Measurement Methods, and their Application (ANIMMA) in Marseille, France and served as a member of the Scientific Committee at the conference June 8th.
- All ATR NSUF sponsored interns arrived at INL.
- Todd Allen visited the University of Pittsburgh and presented a talk on the NSUF.

July:

- Final loading of the University of California, Santa Barbara experiment holders into capsules began in July.
- Weld qualification data sheets for the University of Illinois were completed July 1 for all the gas mixtures requested by UI. Final loading of holders into capsules began in July.

August:

- Todd Allen participated in DOE's Nuclear Energy University Programs (NEUP) annual workshop Aug. 13-14 in Salt Lake City. He presented on the ATR NSUF university research and development program and how it fits with NEUP. During the two-day event, university professors heard about research needs related to the Advanced Fuel Cycle Initiative, Generation IV reactors and other key nuclear energy research areas.
- The University of Illinois and the University of California, Santa Barbara (UCSB) experiments were inserted into the ATR on August 19, 2009. Both experiments were complicated, but in particular the UCSB experiment was an aggressive, complex and multifaceted experiment. A vast majority of the specimens and hardware were loaded at UCSB which resulted in enormous flexibility toward meeting the insertion date.
- August 23-27, 2009, ATR NSUF sponsored the 14th International Conference on Environmental Degradation of Materials in Nuclear Power Systems. This conference is one of the most widely attended international conferences on Light Water Reactor materials. The conference was held in Virginia Beach, Virginia. Todd Allen served as the General Chair, ran the plenary session, and made a presentation on oxidation in supercritical water)

Noteworthy News

Users Week: Students and faculty from universities across the nation, representatives from industry and other experts in nuclear power converged at INL's Advanced Test Reactor National Scientific User Facility for 'User's Week 2009.'

"I'm excited to have high caliber people come into town to share their knowledge and collaborate," said Jeff Benson, ATR NSUF Education Program coordinator. "The goal of ATR Users Week is to educate people on the capabilities for nuclear research that exist at INL and are offered to researchers through the ATR NSUF."

Users Week 2009 Participants

The event has three main goals beyond giving students, faculty and researchers the chance to network:

- Inform potential users about both tools and facilities available through the ATR NSUF to advance nuclear science and technology,
- Provide a forum for researchers to discuss nuclear technology issues, and
- Educate and involve students in current issues involving nuclear technology.

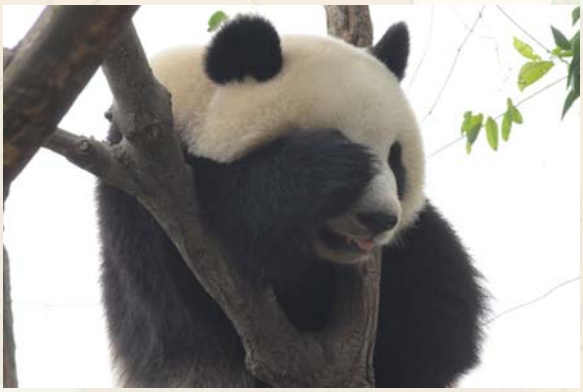
Classes, tours, presentations and hands-on experiments help meet these goals. The discussion topics this year included materials and fuels research, research utilizing the Advanced Photon Source, and current university experiments sponsored by the ATR NSUF. These experiments study the effects of irradiation on materials used in reactors. Results of the experiments could help researchers predict the behavior of materials used in reactors and lead to even better reactor designs and increased plant life. Americans receive roughly 20 percent of their electricity from nuclear power, a carbon-free source. The financial benefits of nuclear reactor advances would be significant since they would allow current plants to operate longer without needing to be replaced by new constructions.

Tour of the Focused Ion Beam Laboratory

As an investment in the future of nuclear research, ATR NSUF awarded 50 travel scholarships to university students and faculty from universities across the country to attend. The scholarships were awarded based on a competitive application submitted by students and faculty. The scholarships covered all the costs associated with attending Users Week.

One of the primary goals of the User Facility is to encourage teamwork among academic researchers, industry experts and government entities that lead to outstanding ideas for scientific experiments.

ATR NSUF in China: Todd Allen, accompanied by INL scientists Phil Sharpe and Heather MacLean, and internationally renowned material scientist Roger Staehle, spent two weeks in May 2009 visiting Chinese nuclear R&D institutions. The institutions included holding companies responsible for designing, building, and operating light water reactors, national laboratories, and major research universities. Dr. Staehle, who has been consulting with Chinese institutions for thirty years, helped establish the itinerary and introduce the INL staff to the Chinese researchers.



At each institution, the INL team listened to a presentation from the host facility and then made presentations on the U.S. nuclear programs, the INL nuclear science and technology programs, and the Advanced Test Reactor National Scientific User Facility. A significant amount was learned about the very aggressive nuclear programs in China, including light water reactors but also extending to gas-cooled and sodium-cooled systems.

A highlight of the trip was a visit to the China Advanced Research Reactor (CARR). This reactor is a new water-cooled reactor built by the China Institute of Atomic Energy (CIAE) for materials testing and neutron scattering. CARR anticipates going critical later in the summer of 2009 so the INL team was able to see the reactor in a fully constructed but not yet fueled condition.

The ATR NSUF sponsored team made many contacts through which future technical collaboration could be possible.

ATR National Scientific User Facility

EXPERIMENT UPDATE

FY 2008 Projects			
Project Institution	**Position**	**Scheduled Insertion Date**	**Scheduled Removal Date**
Colorado School of Mines	MIT Reactor	Various – Spring 2009	Various – Spring/Summer 2009
University of California, Santa Barbara	A-10	Aug 2009	Aug 2010
North Carolina State University	East Flux Trap	Feb. 2009	June 09/Nov 09
University of Illinois	A-9	Aug 2009	Dec. 2010
University of Florida	B-1	Feb. 2009	Apr. 2010
University of Wisconsin	East Flux Trap 4	Aug. 2008	Sept. 2009/ Oct 2010
FY 2009 Projects			
Project Institution	**Position**	**Scheduled Insertion Date**	**Scheduled Removal Date**
Massachusetts Institute of Technology	MIT Reactor	N/A	N/A
University of California, Santa Barbara	I-10	Oct. 2010	Oct. 2011
University of Wisconsin – PIE only	N/A	N/A	N/A
Utah State University	B-2	May 2010	Feb. 2011