

# TRU TeamWorks

A weekly e-newsletter for the Waste Isolation Pilot Plant team

October 30, 2003

## The Big Story

### ARROW-PAK



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#### WIPP Shipments (as of 10/30/03 at 6:59 a.m.)

Shipments  
scheduled to  
arrive at WIPP  
this week  
17

Total shipments  
received at WIPP  
2,129

You've heard of the TRUPACT-II, the pipe overpack, the RH-72B and even the 10-160B. But have you heard about the ARROW-PAK? ARROW-PAK is a transportation container designed to contain and transport high-wattage TRU waste.

High-wattage TRU waste makes up approximately 10 percent of the existing TRU waste inventory at the Savannah River Site (SRS). It has the potential to generate flammable hydrogen gas and would currently require repackaging to comply with Nuclear Regulatory Commission (NRC) transportation requirements.

Repackaging the waste is possible, but would yield unfavorable consequences: it would increase the waste inventory by five to 10 times. For example, to meet gas generation shipping limits, the 5,000 drums of SRS high-wattage waste would have to be repackaged into 25,000 to 50,000 drums. Repackaging would also increase the possibility of worker injuries and costs and counters established ALARA principles for safe nuclear work practices. Therefore, repackaging is not a favorable option. Enter, the ARROW-PAK.

ARROW-PAK is designed to eliminate or reduce the need for repackaging high-wattage waste. The package's thick walls form a "robust" payload container, capable of withstanding the energy of a hydrogen/air reaction. ARROW-PAK is constructed of high-density polyethylene and three assemblies fit inside the TRUPACT-II, which provides the normal TYPE B packaging.

ARROW-PAK has undergone testing required for TRU waste transport containers, successfully completing a vacuum test, design pressure test, drop test, hydrostatic pressure test to failure and a deflagration test. "ARROW-PAK has performed exceedingly well," notes John Jackson, WTS engineer. "In fact, after deflagration testing, the ARROW-PAK unit tested was cut open. The interior revealed no evidence of heat damage or physical stress as a result of the tests."



**Three ARROW-PAK  
assemblies fit into one  
TRUPACT-II**

Soon a report summarizing ARROW-PAK's test performance and specifications will be submitted to the NRC. NRC approval of the container and an approved change to the TRUPACT-II Safety Analysis Report will be required before the ARROW-PAK can be used to transport high-wattage TRU waste to WIPP.

#### In the news



## Going with the characterization flow



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TRU TeamWorks has covered different aspects of characterization in previous articles. Now here is a look at the entire process used by CCP mobile units to characterize, certify and package waste for shipment to WIPP. The flow is an interesting combination of science and technology at work.

The starting point for characterization is acceptable knowledge (AK). AK refers to existing information about a waste stream. Characterization of the waste stream is based upon an understanding of how the waste was generated and what it contains. Once the waste stream is documented, the drums are retrieved from storage and prepared for handling. This preparation involves the installation of a filter vent to allow excess gases to vent. After drums are vented they can be moved forward to the characterization and certification process.



Real-time-radiography (RTR) x-ray scanning is performed on prepared drums. If RTR reveals a prohibited item, such as an aerosol can, the drum is sent into the remediation process. In the instance of an aerosol can, the drum would be opened and a visual examination (VE) performed. The can would be removed or otherwise mitigated. VE is also performed on a sample of waste containers within a waste stream to confirm the accuracy of RTR.

**Left: A drum goes through headspace gas analysis, an important part of the characterization process.**

Non-destructive assay involves the identification and quantification of radioactive elements within the drum. It is followed by headspace gas analysis (HGA).

During HGA, drum gases are analyzed for the presence and identification of flammable gases and hazardous materials or volatile organic compounds. HGA is followed by solids sampling and analysis if necessary. Solids sampling is performed on a sample of drums containing homogenous solids to analyze for chemical hazards. These constituents are measured and the drum is readied for certification.

Certification is a paper process. In each step of the drum's progress a paper trail was generated. This trail is made up of batch reports, which are reports on 12 to as many as 50 drums within a waste stream. Batch reports are consolidated and reviewed for accuracy.

If the drum of waste passes all of the checks and the paperwork is complete, then the drums within the batch are ready to be packaged for transport to WIPP. Portions of the process may be repeated if problems are encountered at any step of the way. But the overall characterization process is engineered to minimize exposure risks to personnel and the environment through a combination of training, quality assurance, procedures and engineering and administrative controls.

**Lights, trailer, action**



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**WIPP Shipments**

(as of 10/30/03  
at 6:59 a.m.)

<p><b>Shipments scheduled to arrive at WIPP this week</b></p> <p><b>17</b></p>
<p><b>Total shipments received at WIPP</b></p> <p><b>2,129</b></p>
<p><b>Total Waste Disposed Underground at WIPP</b></p>
<p><b>CH drums</b></p> <p><b>45,766</b></p>
<p><b>CH standard waste boxes</b></p> <p><b>2,222</b></p>
<p><b>CH ten-drum overpacks</b></p> <p><b>483</b></p>
<p><b>Cubic meters</b></p> <p><b>15,962</b></p>

If a hazmat situation occurs, Idaho's Shoshone-Bannock Tribe is ready. Three years ago, the Shoshone-Bannocks completed remodeling a state-of-the-art emergency response trailer, courtesy of CBFO. The trailer, which was purchased and delivered in 1998, did not actually go into service until after the tribal fire department was restructured and personnel received incident response training in 2000.

The trailer itself is a modified 22-foot-long, 8-foot-wide dual axle aluminum horse trailer. Modified, in the case of this trailer, is an understatement. The trailer accommodates an office area with laptop computer and fax/copy machine, a library of reference materials and a variety of communications equipment – just for the support staff.

Response crews also maintain specialized equipment such as the personal protective gear needed to safely respond to a HAZMAT situation. On-board HAZMAT kits and radiological meters can be used to identify the exact classification of radiation involved in an incident.

Additionally, the trailer houses a small, but complete, weather station to alert emergency response personnel to real-time conditions, an important variable in any incident scenario. The trailer is lighted inside and out and all on-board instrumentation is powered by a 650 watt generator.

A one-ton dually HAZMAT response truck pulls the trailer. The truck was donated by FMC Corporation, a defunct fertilizer production facility. When the facility's doors permanently closed, the company donated the truck to the tribe in a goodwill effort.

To date, the Shoshone-Bannock fire department has responded to five incidents: three hazardous waste spills, and two that involved clandestine laboratories.



**Trailer above similar to the specialized Shoshone-Bannock emergency response trailer.**

Put this in your pipe. . .



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Total Waste Disposed Underground at WIPP

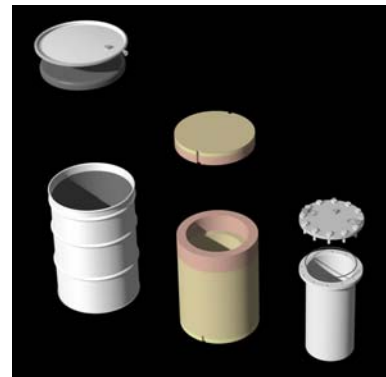
(as of 10/30/03 at 9:12 a.m.)

CH drums 45,766
CH standard waste boxes 2,222
CH ten-drum overpacks 483
Cubic meters 15,962

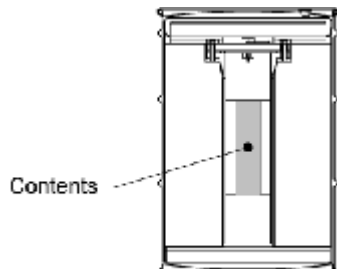
Pipe overpacks don't look that interesting: a pipe packaged in a 55-gallon drum. But from a WIPP packaging engineer perspective . . . the pipe overpack is a beautiful thing. They serve a key role in shipping higher amounts of fissile materials safely.

Why use pipe overpacks? Pipe overpacks ensure that a criticality event will not occur by segregating the fissile material within the TRUPACT-II. An NRC-approved limit of 200 fissile gram equivalent (FGE) of <sup>239</sup>Pu per pipe component allows a TRUPACT-II to safely carry 14 pipe-overpacks for a total of 2,800 FGEs – eight times the FGE of waste packaged in 55-gallon drums, that don't require pipe-overpacks.

Pipe overpacks are unique. Though disposed of in the underground, the pipe overpack is much more than a waste container. According to Brad Day, WTS principal engineer, "Pipe overpacks form part of the packaging safety basis and are as important to confinement, criticality control and dose rate attenuation as any other TRUPACT-II packaging component." Pipe overpacks passed hypothetical accident condition, 30-foot drop tests, and have fabrication and quality requirements that are as stringent as those applied to the TRUPACT-II.



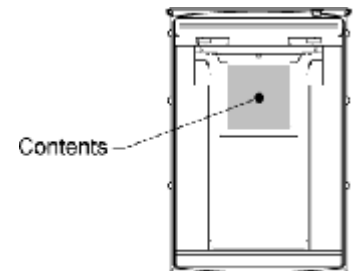
Pipe components come in two basic sizes and there are three types of pipe overpacks used at WIPP. The standard pipe overpack consists of a stainless steel six- or 12-inch diameter pipe component with a flanged lid. When overpacked, the pipe component is positioned inside a 55-gallon drum and rigid poly liner with fiberboard dunnage.



S100 Pipe Overpack

The S100, has a six-inch diameter pipe component and is used for sealed source payloads that require neutron shielding (See [October 23 Big Story](#)). Instead of fiberboard packing, the pipe component is surrounded by wrapped polyethylene sheeting which acts as a shield to attenuate the neutron dose rate.

The S200, with a 12-inch pipe component, includes a lead-lined cavity inside the pipe component used to shield gamma-source wastes. The S200 has two payload capacities: The S200A employs a one-inch-thick lead insert and is designed to hold a one-gallon-sized container, while the S200B cavity is twice as long and has a lead shield thickness of 0.60 inches.



S200 Pipe Overpack

Westinghouse Engineered Products Department of Carlsbad is the prime fabricator of pipe overpacks. Most pipe-overpacked wastes disposed at WIPP originated at RFETS.

## Salt Pile Construction Safety Update



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Activities are underway to rework the 40-foot-high mound of salt, accumulated over 21 years of mining activities at WIPP.

The construction project is a proactive measure that WIPP is taking to maintain compliance with state regulations. It will help prevent infiltration of storm water run-off or precipitation into the ground.

The construction area is posted at all four entries with signs that read "Construction Area - Construction Personnel Only – For Entry Contact George Wilcox." These signs alert all personnel and visitors in the area to be aware of the construction and safety precautions that must be observed.



Haul trucks will continue to have the right-of-way through the north gate. Haul trucks are not required to stop while entering or leaving the north gate. Cross traffic, however, must observe the existing STOP signs. Barricades will continue to be placed in the roadway when the gate is open. The barricade sign reads "STOP – Haul Truck Crossing – Proceed With Caution."

**Caution signs are highly visible around the salt construction project**

Safety meetings, postings and *TRU TeamWorks* will be used to keep personnel advised of access and traffic controls.

"Safety is first at WIPP. It is important that all personnel in the construction area wear the required personal protective equipment: hardhats, safety glasses, steel toe shoes and safety vests," says Kent Aveson, WTS Special Projects manager.

For additional information or if you have any questions about this construction activity, please contact Kent Aveson at 234-8190.

## WIPP fuels local and regional buying power



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*Think globally. Act locally.* It's bumper-sticker philosophy that clearly communicates WIPP's focus on buying business supplies and services right here at home.

WTS Procurement has proposed a regional purchasing initiative to the Department of Energy (DOE) for FY04. Buying from qualified Southeastern New Mexico-based businesses, contractors and vendors has always been a priority for WIPP. The WTS track record for meeting and exceeding goals for doing business with small, minority, disadvantaged and/or woman-owned enterprises is stellar. The proposal steps up the focus on preferred regionally based suppliers.



CBFO this month approved a one-year pilot for a regional preference program to intensify recruitment of regional suppliers for a dizzying array of supplies and equipment ranging from off-the-shelf to one-of-a-kind. The WTS regional purchasing program is among DOE economic development initiatives.

**Left: Carlsbad Block and Supply constructed blocks for massive underground room closure walls at WIPP.**

As managing and operating contractor for one of the largest employers in the region, WTS has committed to conduct business "in a manner that has a positive impact on business and economic development in Southeast New Mexico communities," says John Knoll, manager of WTS Contracts, Procurement and Property Services.

### ***What's the incentive for WIPP to purchase locally and regionally?***

Local economic growth builds on reliable business markets available to WIPP for equipment, technical services and labor. Both WIPP and the supplier benefit from establishing a local business relationship, since WIPP is geographically remote from national labor markets and industry.

### ***How do regional businesses and contractors find out about the preference program?***

WTS Procurement staff consistently recruit potential regional suppliers. The new program specifically designates purchases for Southeast New Mexico businesses. Assistance is provided to businesses and contractors to meet requirements for doing business with WIPP. Workshops and business fairs are also conducted regionally through economic development, community and educational organizations.

### ***Why is a regional preference program a good thing for Carlsbad and other regional communities?***

WIPP subcontracts, purchase orders and credit card purchases total nearly \$50 million a year. In FY2003, WIPP spent nearly half that total in Southeast New Mexico.

"We want to build on our strong record of Southeast New Mexico procurements and strengthen our supplier base in communities near WIPP. The money we spend here meets our needs to run WIPP safely and efficiently; it also helps create jobs," says Knoll.



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## Sandia National Laboratories receives 2003 excellence in technology award

ALBUQUERQUE, N.M. — The Association of University Research Parks (AURP) has presented Sandia National Laboratories its 2003 Excellence in Technology Transfer Award. The association presented the award in September at its 2003 Annual Conference in Vancouver, Canada.

The Excellence in Technology Transfer Award is given to an individual, agency or program that demonstrates great success in taking technology from the lab and nurturing it into a viable and growing business or businesses.

AURP's mission is to promote and support the development and operation of university research parks worldwide. The association serves a broad community consisting of planned and operating research parks and technology incubators around the world. A range of university, governmental, not-for-profit and private organizations interested in the development and operation of technology projects and programs comprise the balance of AURP membership.

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## Audits

CBFO has completed the characterization recertification audit at SRS.

CBFO is auditing the Gas Generation Project and TRU soils sampling from inter-modal containers this week at Rocky Flats. Results will be available next week.

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