TRANSFIX SYSTEM DESCRIPTION

Submitted to

DETROIT EDISON COMPANY

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PROPRIETARY STATEMENT

Enclosures (2) through (5) of this document are design drawings for TRANSFIX equipment and are considered proprietary to NUS Process Services Corporation. Unauthorized distribution or disclosure of these drawings is strictly prohibited.

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I. INTRODUCTION

The NUSPSC TRANSFIX System is a mobile filtration/demineralization system designed to process all of the liquid radwaste at a nuclear power station or to serve as a backup for installed in-plant systems. The system decontaminates wastewater reliably, efficiently and safely, in compliance with all applicable state and federal regulations. The system is designed, fabricated and operated in compliance with the applicable guidelines of NRC Regulatory Guide 1.143, the waste form requirements of 10 CFR 61 and disposal site regulations.

This document presents specifications and data for the system and major components and describes system operation. It also describes the training to which NUSPSC technicians are subjected and the Quality Assurance program under which TRANSFIX Systems are built and operated. Finally, this document describes operational experience at six nuclear facilities in the United States.

II. SYSTEM SPECIFICATIONS

The brochure attached as Enclosure (1) provides general specifications and data, including plant interface requirements for the TRANSFIX System.

A. Performance Criteria

The TRANSFIX System decontaminates radioactive wastewater by passing it through vessels containing filtration media and ion exchange resins. The system is designed to process wastewater at flow rates of 20 to 50 gallons per minute through as many as six vessels connected in series. Decontamination factors of 10^2 to 10^4 are achieved to allow, if necessary, release of the water to the environment without dilution in accordance with 10 CFR 20 requirements.

NUSPSC can provide either disposable vessels made of carbon steel or nondisposable, stainless-steel vessels with resin sluicing capability. The use of disposable vessels eliminates concern with sluicing contaminated resins. The disposable vessels have been sized to fit four into a 14-170 shipping cask, the standard radwaste shipping cask for the nuclear power industry.

When the capacity to remove radioactive material is exhausted, the disposable vessels are dewatered in accordance with disposal site regulations. To ensure total compliance with burial site criteria, the TRANSFIX dewatering system is designed to remove all free or pourable liquids from the vessels. After dewatering, the vessels are loaded into a 14-170 cask, if radiation levels require, and shipped to a low-level radwaste burial site for ultimate disposal.

B. <u>Reliability</u>

Reliability is a key consideration in the system design. The system was designed with an "inherent reliability through simplicity" philosophy. Power plant operations may be restricted if station waste collection tanks are full and waste cannot be processed.

The TRANSFIX system requires minimal maintenance and NUSPSC technicians are trained to perform all repairs required to keep the system operating. Components needing repairs beyond the technician's capability are simply replaced and returned to the NUS Process Services maintenance facility.

C. Design Criteria

1. Process Piping - All TRANSFIX™ process piping is designed, fabricated and tested in accordance with ANSI B31.1. All stainless materials are used in system piping and, where practical, in the selection of piping components, such as valves gauges, pumps, etc. Thus corrosion which could affect the system integrity is minimized. The waste processing lines are nominally 1 1/2 inch in diameter and are designed such that radioactive material will not collect in low points or crevices.

2. Welding - Welding of piping is performed by welders and procedures qualified to ASME Section IX. System piping is designed for an operating pressure of 150 psig and is hydrotested at 225 psig (1.5 times the operating pressure) for a minimum of 30 minutes in accordance with ANSI B31.1.

3. Vessels - All TRANSFIX™ filtration and ion exchange vessels are pressure vessels which are designed, fabricated and tested in accordance with ASME Section VIII. The vessels have a design pressure of 150 psig and are hydrotested to 225 psig. A pressure relief is provided on the Control & Sample Panel as required by Section VIII to protect the system in the event an overpressure condition occurs.

4. Hoses - Hoses with quick-connect end-fittings are used to connect system piping units and vessels. All hoses are compatible with the radwaste water environment and have a minimum operating pressure equal to that of the system pressure (150 psig). The hoses are hydrotested after fabrication to ensure the integrity of the end-fittings and the absence of defects in the hose materials. The hoses are selected to be resistant to the effects of abrasion and abuse during operations.

5. Electrical - All system electical components are selected and installed in accordance with the National Electric Code (NEC). Motors are totally enclosed, fan cooled types suitable for both indoor and outdoor applications. Motor and process controls are mounted in National Electric Manufacturers Association (NEMA) Type 4 enclosures, designed for indoor or outdoor use. NEMA Type 4 enclosures are designed to meet hosedown, dust, external icing and rust-resistance tests.

D. Radiation Safety

TRANSFIX is designed to minimize personnel exposure to radiation in accordance with NRC Regulatory Guide 8.8 (ALARA). The system is designed to be operated remotely and lead shielding is provided to attenuate radiation from the filtration and ion exchange vessels.

In addition, filtration/ion exchange is inherently effective in minimizing radiation exposures. TRANSFIX concentrates radioactive materials in the ion exchange resins which are removed when the vessels are removed from the system.

III. COMPONENT DESCRIPTIONS

The TRANSFIX System is composed of the waste processing system, which includes the Plant Connection Skid, the Control & Sample Panel and the process vessels, and the dewatering system. Piping and instrumentation diagrams (P&ID's) for the processing and dewatering systems are presented in Enclosures (2) and (3) respectively. The major components are described in the following paragraphs.

A. Process Control Equipment

The process control equipment consists of the Plant Connection Skid (PCS) and the three sections of the Control & Sample Panel (CSP).

The PCS is the interface between the stat.on radwaste system and support services and the TRANSFIX™ System. Waste is pumped from the plant to the PCS which contains process valving and service conr.ctions for electrical power, compressed air and ser ice water (noncontaminated). The PCS also contains flow meters and a waste totalizer. A centrifugal pump is installed to boost the waste supply pressure as required to maintain the system design flow rates of 20-50 gpm. This pump can be bypassed if the station pump can provide sufficient pressure to the inlet of the TRANSFIX System.

From the PCS, the waste is directed by hose to the Control & Sample Panel (CSP) which provides valving and hose connections to the filtration and ion exchange process vessels. Pressure gauges to monitor the inlet and outlet pressure of each vessel are located on the CSP. The process flow is mimicked on the panel face to assist the system operator in operating the system safely. A vent line and a pressure relief valve, as required by ASME Section VIII, are also provided on the panel. A sample sink, located at one end of the panel, provides a separate sample point for the inlet and outlet of each vessel thus preventing cross-contamination of samples.

B. <u>Filtration and Ion Exchange Vessels</u>

At the heart of the TRANSFIX™ System are the vessels containing the media which remove the radioactive material from the waste stream. The vessel fabrication drawing is attached as Enclosure (4).

The TRANSFIX™ filtration and ion exchange vessels are disposable pressure vessels which are designed, fabricated and tested in accordance with the ASME Boiler and Pressure Vessel Code, Section VIII. The vessels are constructed of carbon steel, have a design pressure of 150 psig and are hydrotested to 225 psig.

Ion exchangers containing cation resins have an interior protective coating to resist corrosive acid attack.

The standard ion exchangers contain 23 cubic feet of resin or filtration media and have a disposal volume of 29.3 cubic feet. This provides a volumetric efficiency as defined by the resin volume divided by the disposal volume of 78.5%. In addition, ion exchanger inlet and outlet distributors have been designed to provide a uniform flow profile through the vessels, thereby allowing nearly complete utilization of ion exchange resin capacity. Thus, volumetric efficiency is very high and provides maximum concentration of radioactive material for the specific disposal volume.

C. Shielding

Process shields designed for use with the TRANSFIX System pressure vessels minimize the radiation exposures of operating technicians in accordance with ALARA guidelines. The process shields are open ended, right circular cylinders constructed of lead with a rugged steel skin to provide maximum shielding capability in a minimum amount of space and to facilitate ease of handling and transport around the power plant. The cylinder shields are located in the process area and the vessels placed into the shields. The shields are 38 inches in diameter, have an overall height of 72 inches and a weight of approximately 7500 pounds. The wall thickness provides the equivalent of 2 inches of lead in attenuating gamma radiation. The fabrication drawing for the process shields is attached as Enclosure (5).

D. Dewatering System

The TRANSFIX™ Dewatering System is a skid-mounted system designed for removing free water from TRANSFIX™ pressure vessels. The system uses a blower to pull heated air through the vessel to strip and remove free water. The process is described

more fully in Section IV.F. The piping and instrumentation diagram (P&ID) for the TRANSFIX dewatering system is presented as Enclosure (3).

The performance of the system was tested in dewatering TRANSFIX vessels to free-standing water criteria specified by 10 CFR 61 and the low-level radioactive waste disposal sites. Tests were performed with both bead-type ion exchange resin and activated carbon.

In the testing, a test vessel loaded with non-radioactive ion exchange resin or activated carbon was filled with water. The vessel was dewatered in accordance with the process described . The drain plug was then removed from the test vessel to measure the volume of free water remaining in the vessel. In several of the tests, the test vessel was transported in a truck over the highway for over 120 miles prior to draining to simulate transportation conditions.

The test results demonstrated the effectiveness of the dewatering system in eliminating all free water from TRANSFIX vessels. The testing results have been submitted to and approved by the State of South Carolina Department of Health and Environmental Control.

IV. OPERATIONAL DESCRIPTION

All TRANSFIX System operations are performed in accordance with approved operating procedures.

A. System Assembly

The system components are assembled in a processing area specified by the power plant. The location selected is based on many factors including space availability, access to the waste source, access to shipping areas and background radiation levels. The

lead process shields which weigh 7500 pounds each are lifted and moved into place using the shield lifting slings and a fork truck or overhead crane. The three sections of the Control & Sample Panel (CSP) are then placed approximately 24" from the shields and the Plant Connection Skid is placed within 10 feet of the CSP. Vessels, which weigh approximately 2000 pounds and are filled with the appropriate ion exchange media, are then placed in the shields. System hoses are then connected and all cam-and-groove quick-connects are secured to prevent inadvertant disconnection. The dewatering skid must also be placed in an area where the TRANSFIX vessels will be dewatered after exhaustion. Enclosure (1) contains photographs of a typical TRANSFIX installation at an operating power station.

B. Waste Processing

Prior to initiation of waste processing, a valve lineup is performed, with inlet and outlet isolation valves opened for vessels through which waste will be processed. Bypass valves are opened for vessels which will be bypassed during waste processing. The system is then leak tested and any leaks repaired prior to waste processing.

The NUSPSC technician notifies the power station operator that the TRANSFIX System is ready for processing. The station operator makes the lineup to pump waste to the TRANSFIX System and direct decontaminated waste to the station monitor tanks. When the waste transfer pumps have been started, the NUSPSC technician throttles the flow rate to establish a waste flow rate of 20-40 gpm. If the plant supply pressure is insufficient to achieve the desired flow rate, the PCS booster pump is started to increase the system inlet pressure and flow rate. The booster pump is protected against damage from loss of waste flow with a low-pressure trip switch. The pump is also tripped on high pressure (135 psig) in case the pump

discharge is inadvertently closed. This will prevent lifting of the pressure relief and the resulting waste flow back to the plant drain.

The system is secured by turning off the booster pump (if on) and notifying the plant operator to secure waste supply to the system and the monitor tank lineup. System valves are then shut for protection against leaks during system shutdown.

C. Chemistry Analysis

System performance is monitored by analysis of grab samples obtained from the inlet and outlet of each vessel in service. The NUSPSC technician performs pH and conductivity analyses and provides samples to the plant chemistry personnel for isotopic analysis. The activity loading of each vessel is calculated using the analyses and the volume of waste processed.

D. Resin/Filter Media Selection

Deep-bed filtration using activated carbon is normally used upstream of the ion exchangers. Activated carbon performs well in removing particulates, such as activated corrosion products, and organic contaminants such as oils and other organic chemicals commonly used in power stations.

Following the filter vessel(s) are normally two cation exchangers containing strong-acid gel resin in the hydrogen form. The cation resins remove the largest portion of radioactive material in the waste stream, primarily radioactive cobalt and cesium.

Normally downstream of the cation resins is a vessel containing anion resin and the last vessel in series containing a mixed-bed resin. The anion resin is a

strong-base gel resin in hydroxide form which becomes saturated with boric acid (when present in the waste stream) soon after being placed in service. Decontamination capability is not affected, however, as the weak boric acid is displaced by the stronger acids in the waste stream. Radioactive iodine is the primary nuclide removed by anion exchangers. The last vessel in service serves as a polisher and contains a mixture of the cation and anion resins described earlier.

Another anion resin is often used in place of the mixed resin in the polishing vessel. The resin is a macroreticular, strong-based resin in the hydroxide form. The exchange capacity of this particular resin is relatively low, 0.5 meq/ml versus 1.1 meq/ml for a gel resin. The primary function, however, is not ion exchange but filtration of colloidal materials such as cobalt which may not be easily filterable or removed by ion exchange. If decontamination factors begin to decrease for the TRANSFIX System, due to leakage of cobalt, the macroreticular resin may be used to remove the cobalt.

E. Vessel Removal

Conductivity and pH measurements provide information regarding the remaining capacity of the vessels in service. This information is used in conjunction with isotopic analyses to determine when vessels are to be removed.

When using redundant cation vessels, the upstream vessel will become exhausted first. The exhausted vessel is then removed from service and the following vessel "moved up" in the process flow path by exchanging hoses. A new vessel is then placed in the backup position, thereby ensuring that older resins are exhausted first and that full-capacity new resins are used in a polishing position.

F. Dewatering

When a vessel is removed from service, it is blown down initially with service air to remove the bulk of the water. Inlet and outlet hoses are then connected between the dewatering skid and the vessel, which may be located in another shield for dewatering. The blower and heater, which heats air to approximately 150°F, are started. The suction created by the blower pulls the heated air into the vessel inlet and water-laden air from the vessel outlet to the dewatering skid. The water is then separated from the air by a coalescing filter and collected in a 15-gallon tank. The air is filtered through a high-efficiency filter prior to entering the blower. The air discharged from the blower may be released to the process area or, if desired, directed to a monitored HVAC system. In the numerous dewatering operations performed with TRANSFIX vessels, no airborne activity has ever been detected.

The volume of water collected in the tank is monitored periodically during the dewatering procedure. When no increase in the water level is observed during a dewatering cycle, all free water has been removed from the vessel and the procedure is terminated. A process control program with detailed procedural instructions is followed during actual dewatering activities.

V. PERSONNEL TRAINING

Technicians assigned to field projects are trained and qualified in accordance with the NUSPSC procedure AD-011 entitled, "Field Technician Training." The program is designed to ensure that technicians have the training and experience necessary to assure that technicians carry out their dutiesin a proper and safe manner. The program reflects a progression in skills from

Technician III (entry-level, relatively little experience) to Technician II (fully qualified for equipment operations) to Technician I (fully qualified for equipment setup, operation and supervision). The overall qualification program is divided into four major areas described in the following paragraphs:

A. Pre-employment Review - The technician's academic credentials and previous work experience are verified. The required security checks are completed.

B. General Employment Training - The technician completes a core training program on Health Physics, Quality Assurance, Industrial Safety and NUS Process Services administrative instructions.

C. Technical Qualification Checklist - This is a progressive checklist used to qualify the technician for equipment qualifications. It includes in-depth familiarization with equipment operating and maintenance procedures and actual equipment operation under qualified supervision. Log-keeping and administrative items are also covered.

D. Technician Certification - At each level of qualification, the technician is certified by the appropriate operations manager. This certification is a final subjective analysis of the technician's capabilities to assume the applicable technician position and level of certification. Technicians are recertified annually as part of the technician's annual performance evaluation.

A copy of the "Field Technician Training" procedure and the technician certification document are available for review upon request prior to the technician's assignment to the station.

VI. QUALITY ASSURANCE

A. NUSPSC Quality Assurance Program

The NUS Process Services Corporation Quality Assurance Program was established to provide assurance that the design, fabrication, testing and use of processing materials and equipment is accomplished under strict quality assurance requirements, which conform to the extent practicable with the guidelines provided in the U.S. Nuclear Regulatory Commission's Regulatory Guide 1.143. The NUSPSC Quality Assurance Manual defines the program established by NUSPSC to support the applicable sections of Regulatory Guide 1.143 and its referenced documents. This program complies with the requirements of 10 CFR 50, Appendix B and has been successfully audited by NUS and utility quality assurance groups.

It should also be noted that all process control programs which assure that waste products are acceptable to particular burial sites fall under the NUS Process Services QA Program. For example, process control programs related to resin dewatering or waste solidification are backed up with a data package which provides the assurance that performance of the procedures will result in a product meeting regulatory criteria.

NUS Process Services Corporation has an NRC approved QA Program complying with the requirements of 10 CFR 71, Subpart H, entitled "Quality Assurance," Regulatory Guide 7.10 entitled, "Establishing Quality Assurance Programs for Packaging Used in the Transport of Radioactive Material," and 10 CFR 50 Appendix B.

VII. OPERATING EXPERIENCE

Since 1982, over 7,000,000 gallons of radioactive wastewater has been processed by TRANSFIX Systems at six facilities in the United States. Table 1 summarizes the actual processing experience with TRANSFIX.

As indicated in the table, the TRANSFIX services provided at Toledo Edison's Davis-Besse, New York Power Authority's Indian Point III and Florida Power Corporation's Crystal River stations have been full-time applications in which TRANSFIX has processed all of the radioactive wastewater generated at these facilities. The installed plant waste evaporators were not used at all during the periods of TRANSFIX service.

Waste activities vary considerably between the plants but are typically 10^{-4} to 10^{-2} microcuries/cc. Effluent activities are typically 10^{-5} to 10^{-6} microcuries/cc to less than minimum detectable activity levels (MDA).

Table 1. TRANSFIX SERVICE EXPERIENCE

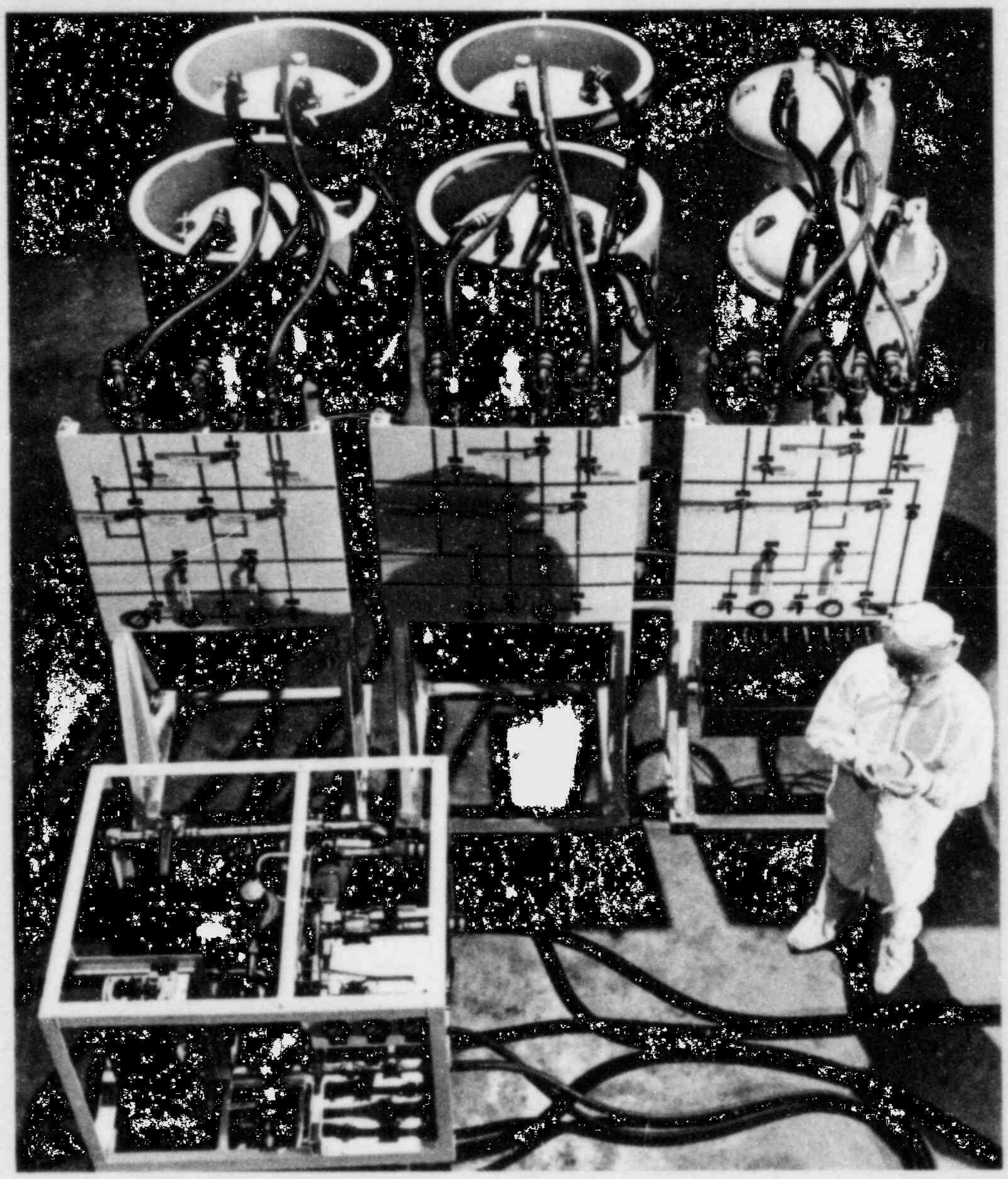
Customer	Facilty	Description	Period of Service	Gallons Processed
Toledo Edison Company	Davis-Besse	Full-time service (disposable)	Feb. '82 - Present	1,000,000
New York Power Authority	Indian Point III	Full-time service (disposable)	Feb. '82 - Present	2,400,000
Commonwealth Edison Co.	LaSalle	Emergency response	Nov. '83 - Dec. '83	Unknown
Charleston Naval Shipyard		Vessels provided	1984	Unknown
Florida Power Corp.	Crystal River	Full-time service (sluiceable)	Nov. '83 - Present	3,000,000
Portland General Electric	Trojan	Vessels/shields provided (sluiceable)	June '84 - Present	Unknown

ENCLOSURE (1)

TRANSFIX BROCHURE

TRANSFIX®:

The Most Efficient Transportable Radwaste Processing System Available



And We've Got the Numbers to Prove It

NUS PROCESS SERVICES
1501 KEY ROAD, COLUMBIA, S.C. 29201
(803) 256-4355
A Halliburton Company

WHY SO MANY NUCLEAR UTILITIES ARE TURNING TO TRANSFIX

It's no secret. The radwaste processing equipment originally installed at many nuclear plants is unreliable, costly to operate, and the source of excessive man-rem exposure during maintenance and repair. In addition, regulatory requirements have become more stringent, and the cost of disposal has increased exponentially, making it imperative for station operators to use an effective, reliable method of processing radwaste water.

To meet this need, station managers across the United States are choosing TRANSFIX Filtration/Ion Exchange Service. TRANSFIX Service includes the process control equipment, personnel, and filtration and ion exchange vessels required for waste processing. Advanced filtration and ion exchange techniques make TRANSFIX the most efficient transportable system available in the industry. At many plants, TRANSFIX is already an extremely cost-effective alternative to evaporation/solidification.

How can we make these claims? Take a look at the advantages TRANSFIX offers.

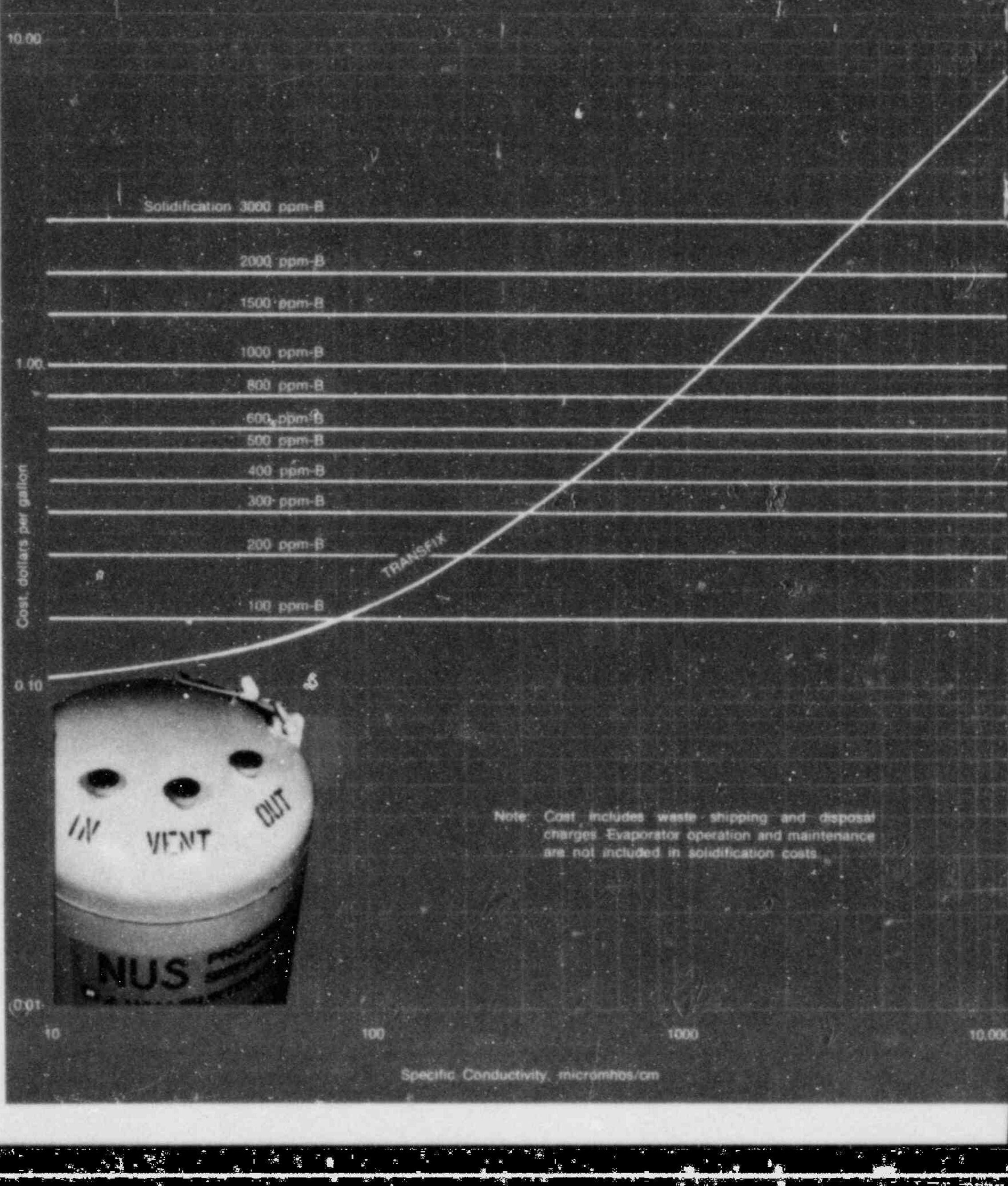
HOW DOES TRANSFIX WORK?

TRANSFIX Service decontaminates radwaste water by passing it through vessels containing filtration media and ion exchange resins. We provide either disposable vessels made of carbon steel or nondisposable, stainless-steel vessels with resin sluicing capability. When the capability to remove radioactive material is exhausted, disposable vessels are dewatered or solidified in situ and then shipped to a low-level radwaste disposal site. In both cases, the resulting end product contains zero free-standing water and complies with all federal and state disposal regulations. All vessels are fabricated in compliance with Section VIII of the ASME Boiler and Pressure Vessel Code.

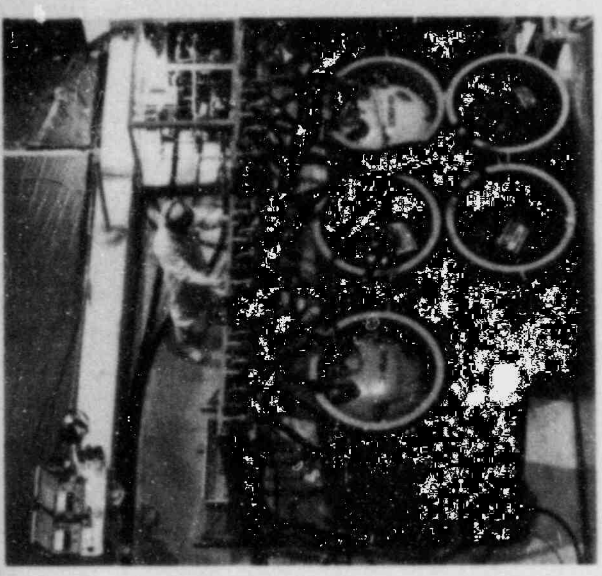
TRANSFIX equipment includes process control skids, shielding, disposable and nondisposable vessels, dewatering skids, and solidification or resin sluicing equipment. With the various equipment options, NUS Process Services can tailor the service to meet the specific conditions and requirements of your plant.

Table 1

COMPARATIVE COST OF DECONTAMINATING RADIOACTIVE WASTEWATER BY TRANSFIX AND EVAPORATION/SOLIDIFICATION



Note: Cost includes waste shipping and disposal charges. Evaporator operation and maintenance are not included in solidification costs.



CUTS COSTS 20 TO 80 PERCENT

Compared to the alternatives, TRANSFIX reduces overall processing and disposal costs 20 to 80 percent. For a typical PWR station (Table 1), we can reduce the cost of processing radwaste water by 67 percent.

Because of optimal engineering design, TRANSFIX costs significantly less than other ion exchange services available in the industry. According to the station operators at three power stations where TRANSFIX replaced other services, processing costs dropped 30 percent, 50 percent, and 50 percent, respectively.

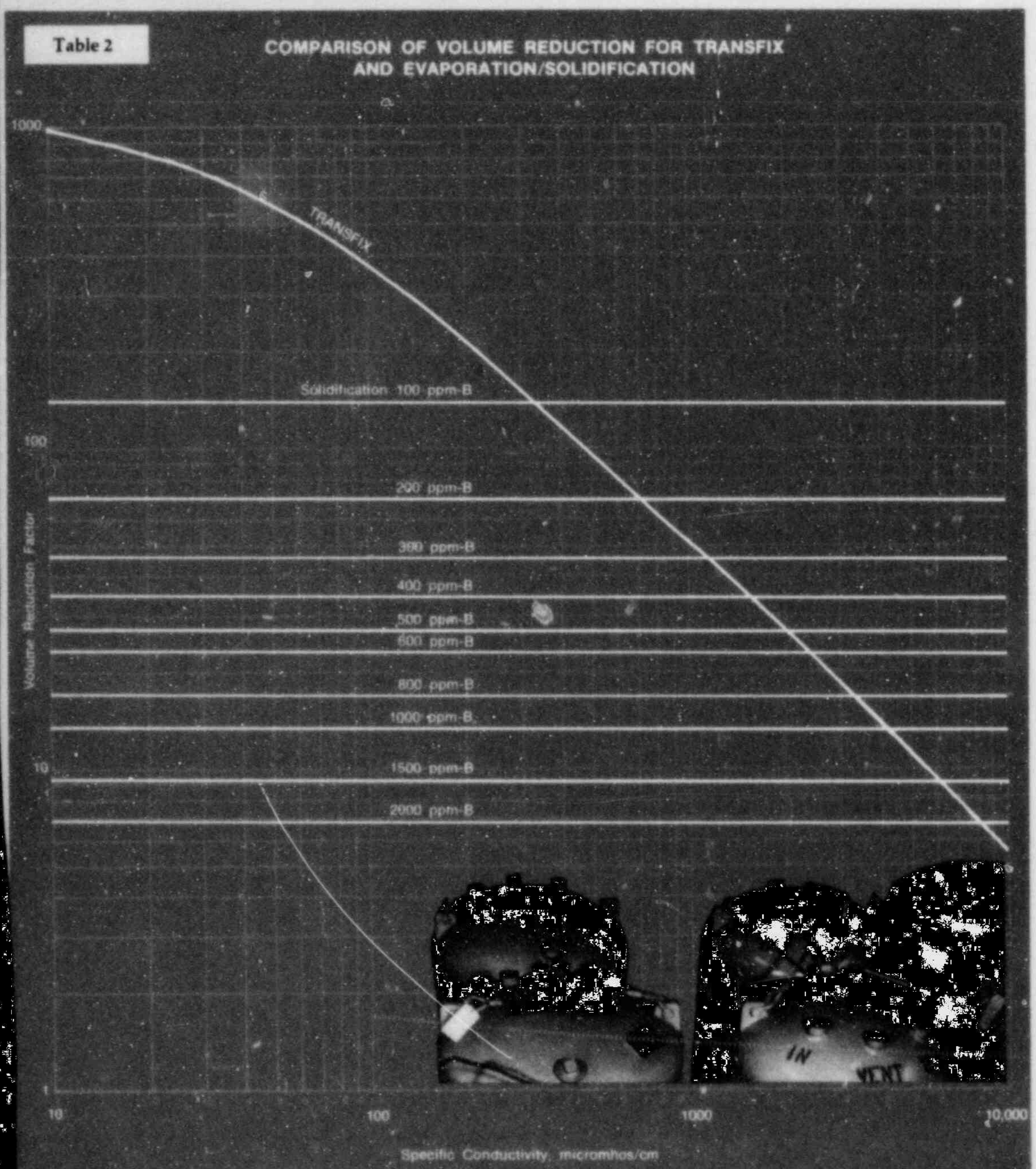


Table 2 COMPARISON OF VOLUME REDUCTION FOR TRANSFIX AND EVAPORATION/SOLIDIFICATION

HIGH DECONTAMINATION FACTORS

TRANSFIX regularly produces decontamination factors of 10^3 to 10^4 with effluent activity levels less than MDA. This high level of performance is achieved by optimizing vessel loadings with materials selected from our large inventory of high-capacity ion exchange resins and filtration media.

NINETY PERCENT LESS VOLUME THAN EVAPORATION/ SOLIDIFICATION

Disposal costs are skyrocketing. And even when a utility can cover these large cost increases, volume limitations make disposal space hard to come by. As a result, reducing disposal volume is a high priority for plant radwaste managers.

For normal waste streams, TRANSFIX achieves volume reduction factors of 100 to 500. This offers a dramatic improvement over evaporation/solidification. As Table 2 demonstrates, TRANSFIX produces 90 percent less volume than evaporation/solidification at a typical PWR with a waste conductivity of 500 micromhos/cm and a boron concentration of 600 ppm.

COMPLETE REGULATORY COMPLIANCE

TRANSFIX Service complies with all applicable state and federal disposal site regulations. We designed, fabricated, and now operate all our equipment in compliance with applicable requirements of NRC Regulatory Guide 1.143, the waste form requirements of 10CFR61 and disposal site regulations. In addition, we perform all processing and fabrication operations in accordance with procedures and process control programs developed under the NUS Process Services Quality Assurance Program. This program in conjunction with the quality assurance plan for radioactive packaging has been approved by the NRC.

The TRANSFIX System is easily maintained by the Operating Technician.

LOW MAN-REM EXPOSURE MEETS ALARA GUIDELINES

We built TRANSFIX to minimize personnel exposure to radiation in accordance with NRC Regulatory Guide 8.8 (ALARA). Our engineers designed the Control and Sample Panel to allow technicians to control the system remotely. We also provide thick lead shields for TRANSFIX vessels and 200 cubic foot concrete storage shields to store vessels or cask liners containing exhausted resins.

In addition, filtration/ion exchange inherently reduces exposure. TRANSFIX concentrates radioactive materials in the ion exchange resins, which are removed when either disposable vessels are removed or the resins are sluiced from the system. Waste evaporators, on the other hand, form highly contaminated scale and routinely require tube plugging, replacement, and chemical cleaning. High man-rem exposures have resulted; one utility reports 30 to 50 man-rem per year accumulated during evaporator repair work.

TRANSFIX GUARANTEES ABSOLUTE RESIN DEWATERING

Meeting the free-standing water requirements for the disposal of radioactive resins and solidified media is a tough management headache. At the Barnwell, South Carolina disposal site, free-standing water in carbon steel containers must be less than 0.5 percent of the waste volume or about .85 gallons for TRANSFIX vessels. This wasn't good enough for NUS Process Services. The only way to assure that the requirements are met is to remove all free-standing water from vessels prior to shipment. To do this we made a vacuum drying system as a standard feature of TRANSFIX. Because the system strips and evaporates water so effectively from the media contained in the vessel, *we guarantee 100 percent removal of free-standing water.*

HIGHER RELIABILITY THAN WASTE EVAPORATORS

With normal availability factors of only 50 to 75 percent, waste evaporators are too unreliable. We designed TRANSFIX with a *simple-is-better* philosophy that achieves maximum reliability. Power plant operations may be restricted if waste cannot be processed and sufficient waste tankage is unavailable. TRANSFIX requires minimal maintenance, and our technicians are trained to perform most repairs needed to keep the system running. Components requiring repairs beyond the technician's capability are simply replaced and returned to the NUS Process Services maintenance facility.

CERTIFIED TECHNICIANS

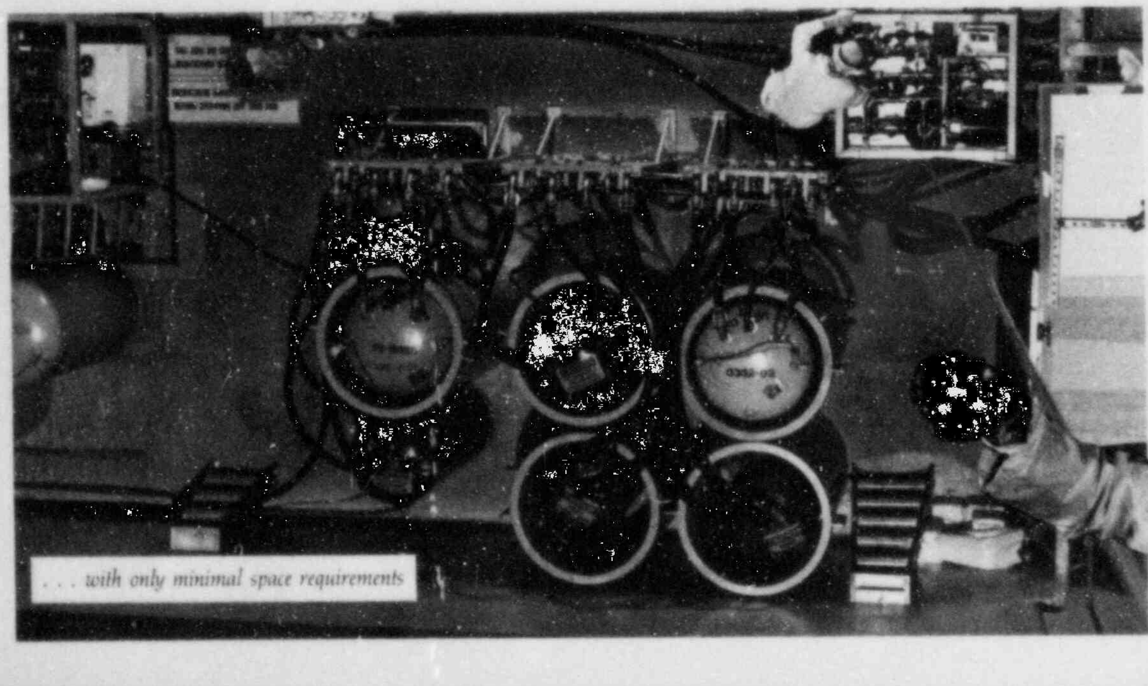
Only trained, professional radwaste technicians operate TRANSFIX equipment. Technicians assigned to field projects are trained and qualified in accordance with the NUS Process Services procedure entitled *Technician Qualification.* We only hire professionals with previous nuclear experience. They are then certified following satisfactory completion of classroom and on-the-job training. At NUS we stand by the quality of our people and are glad to provide technician certifications for review prior to a technician's assignment to a station.

TRANSFIX can be installed in less than 24 hours.

LESS-THAN-A-DAY INSTALLATION; MINIMAL SPACE REQUIREMENTS

You heard us right. Because TRANSFIX is a mobile, skid-mounted system we can install it onsite in less than a day in an area of less than 400 square feet. Table 3 lists system interface requirements. NUS Process Services provides equipment not only for routine waste processing but also for emergency operations requiring rapid response. We can mobilize personnel immediately and ship equipment from our Columbia, South Carolina facility *within hours of the initial request for assistance.*

After one BWR station lost the use of all three evaporators, we mobilized TRANSFIX Service to process the station's waste. The call for help came after five o'clock on a Friday. TRANSFIX trucks loaded with eight vessels arrived onsite at eight o'clock Monday morning. As the station radwaste manager said, "TRANSFIX really saved the bacon."



. . . with only minimal space requirements

Certified TRANSFIX Technician

Table 3

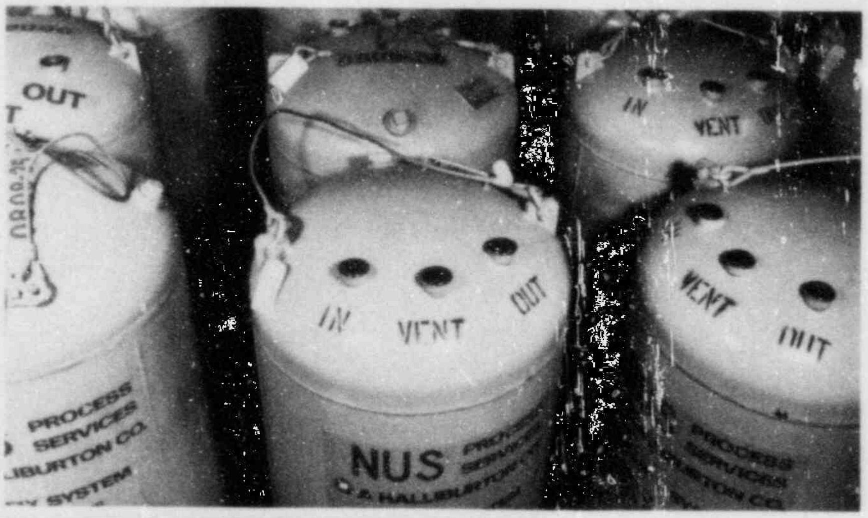
TRANSFIX INTERFACE REQUIREMENTS

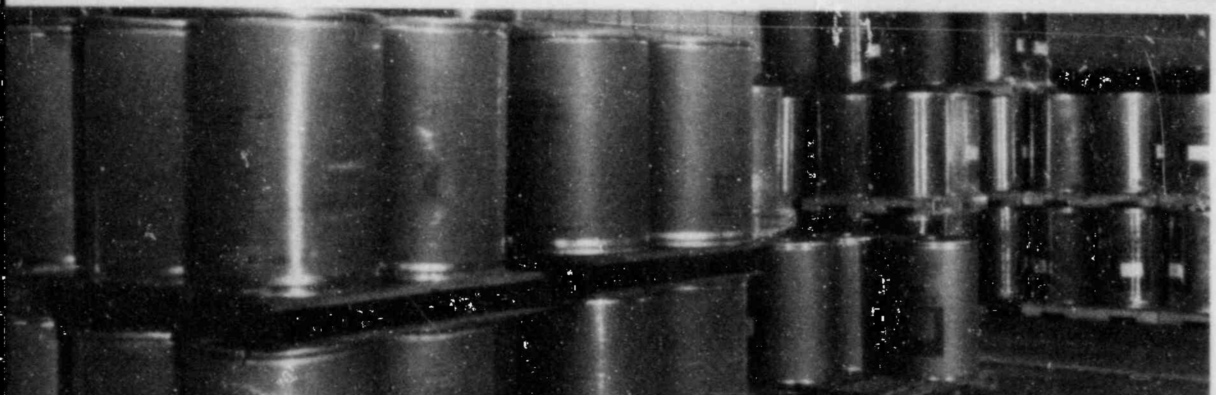
Process Area:	
Waste Processing	200 ft^2
Dewatering	75 ft^2
Vessel Solidification	125 ft^2
Electrical Power: (440/460/480 VAC, 3 phase, 60 hz)	
Plant Connection Skid	20 amp
Dewatering Skid	30 amp
Vessel Solidification	50 amp
Service Water: (noncontaminated) 15 gpm @ 80 ± 20 psig	
Service Air: (@ 100 psig)	
Plant Connection Skid	25 SCFM
Resin Fill Skid	60 SCFM
Forklift/Crane:	
Process Shield	7,500 lbs
Storage Shields	27,000 lbs
Standard Vessel	1,800 lbs
Solidification Vessel	2,500 lbs
Nondisposable Vessel	650 lbs

SUPPORT FROM NUS PROCESS SERVICES

NUS Process Services provides mobile service support from Columbia, South Carolina. The 33,000 square foot facility is licensed for the receipt, storage, maintenance, and repair of contaminated equipment. Repair parts, pressure vessels, resin, and filtration media are inventoried in Columbia to provide prompt response to any field requirements. Qualified shop personnel are also available to support these needs.

All process equipment designed and fabricated by NUS Process Services complies with the applicable requirements of Regulatory Guide 1.143, Regulatory Guide 8.8, and other industry standards. We perform all work under the NUS Process Services Quality Assurance Program.





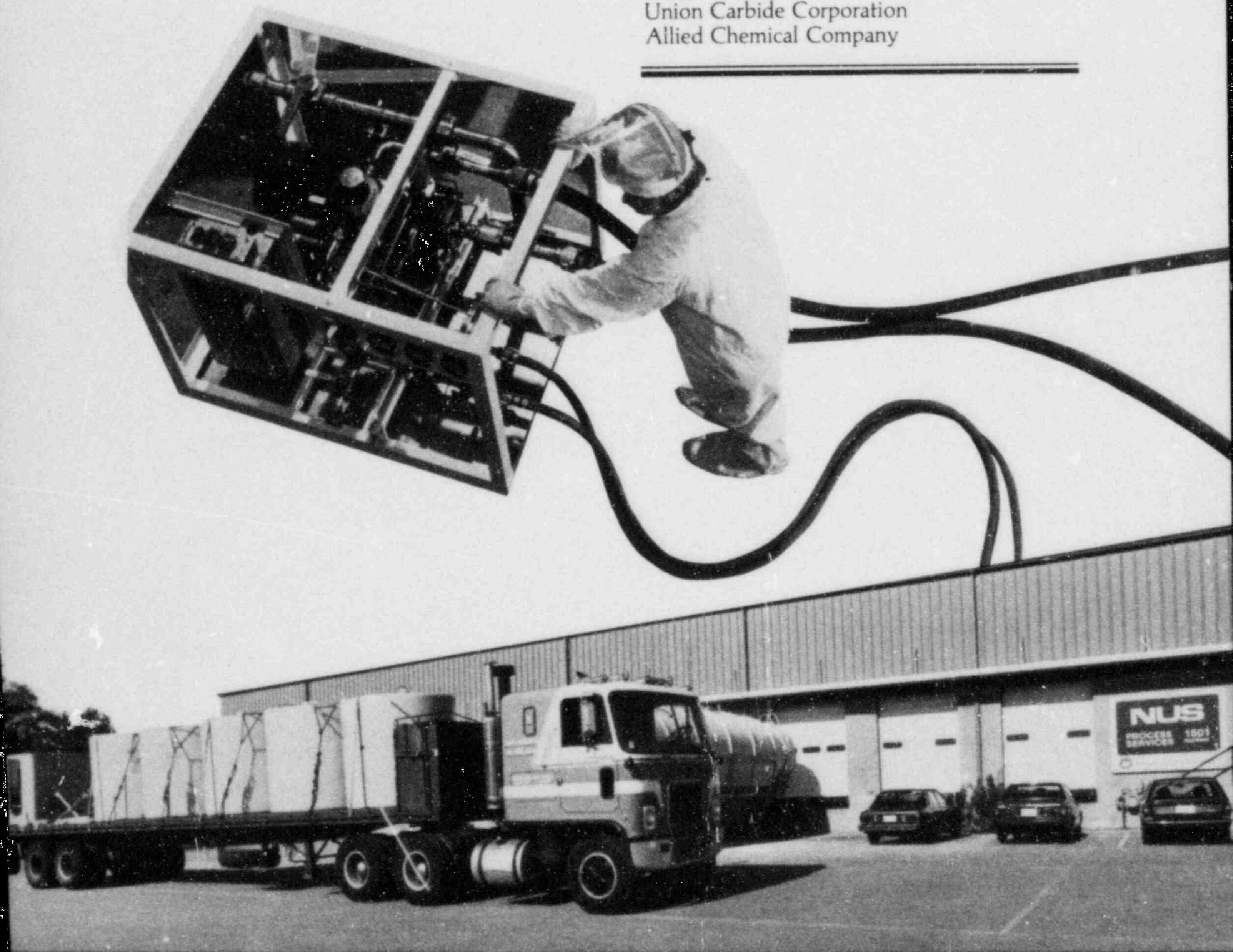
NOW YOU KNOW THE FACTS

Reducing the cost and volume of radwaste while complying with regulations is the challenge confronting radwaste managers in the 1980s. As our list of customers indicates, more and more nuclear utilities are answering this challenge with NUS TRANSFIX Service.

Can TRANSFIX help your plant? Give us a call today at 803-256-4355, and find out.

OUR CUSTOMERS

New York Power Authority
Toledo Edison Company
Florida Power Corporation
Omaha Public Power District
Detroit Edison Company
EG&G Idaho, Inc.
Cincinnati Gas & Electric Company
Southern California Edison Company
Public Service Gas & Electric Company
Baltimore Gas & Electric Company
GPU Nuclear
Iowa Electric Light & Power Company
Commonwealth Edison Company
Vermont Yankee Nuclear Power Corporation
Duke Power Company
Virginia Electric & Power Company
Dairyland Power Cooperative
Charleston Naval Shipyard
Niagara Mohawk Power Corporation
Union Carbide Corporation
Allied Chemical Company



NUS PROCESS SERVICES ALSO OFFERS:

Radwaste Solidification Service
Liquid Abrasive Decontamination
Radwaste Transportation Service
10CFR61 Consulting Service
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A Halliburton Company

ATTACHMENT 2