

**EASTERN TECHNOLOGIES, INC. LICENSE APPLICATION DATED JANUARY 30, 2004  
(NRC License No. 01-30362-01; Docket No. 030-36499)**

INFORMATION IMPORTANT TO SECURITY OF RADIOACTIVE MATERIAL HAS BEEN  
REMOVED BY THE NRC. A COMPLETE COPY OF THE DOCUMENT CAN BE FOUND AT  
ADAMS ACCESSION NO. ML040510525.



**EASTERN TECHNOLOGIES, INC.**

Post Office Box 409  
Ashford, Alabama 36312

January 30, 2004

Donna Janda  
USNRC  
475 Allendale Road  
King of Prussia, PA 19406-1415

SUBJECT: Application For Material License

J-5  
L 30362  
03036499  
03218  
(01-30362-01)

Dear Ms. Janda:

Enclosed is ETI's application for material license and supporting documentation and procedures.

I believe this submission to contain all data requested by NUREG-1556, Vol. 18. Please advise me at your convenience if I have overlooked any material.

Should you need to contact me, please do so at your convenience.

Sincerely,

Mark Fellows  
Vice President  
Eastern Technologies, Inc.

MF:mbw

134442  
NMSS/RGNI MATERIALS-002  
REC'D IN LAT FEB - 3 2004



**EASTERN TECHNOLOGIES, INC.**

Post Office Box 409  
Ashford, Alabama 36312

February 4, 2004

Ms. Donna Janda  
United States Nuclear Regulatory Commission  
Region I  
475 Allendale Road  
King Of Prussia, PA 19406-1415  
U.S.A.

**Subject: Decommission Funding Plan Cost Estimate & Radiation Protection Program**

Dear Ms. Janda:

As per our phone conversation I have reviewed ETI's Decommission Funding Plan Cost Estimate and Radiation Protection Program and have concluded that they do not need to be considered confidential or proprietary information. Thank you for bringing that to my attention.

During the review of our license application please contact me at your convenience should you have questions. I will also be glad to meet with you in person as required.

Sincerely,

A handwritten signature in black ink that reads "Mark Fellows". The signature is written in a cursive, flowing style with a long horizontal stroke at the end.

Mark Fellows  
Vice President  
Eastern Technologies, Inc.

134442

Estimated burden per response to comply with this mandatory collection request: 7 hours. Submittal of the application is necessary to determine that the applicant is qualified and that adequate procedures exist to protect the public health and safety. Send comments regarding burden estimate to the Records Management Branch (T-6 E6), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by internet e-mail to [infocollects@nrc.gov](mailto:infocollects@nrc.gov), and to the Desk Officer, Office of Information and Regulatory Affairs, NEOB-10202, (3150-0120), Office of Management and Budget, Washington, DC 20503. If a means used to impose an information collection does not display a currently valid OMB control number, the NRC may not conduct or sponsor, and a person is not required to respond to, the information collection.

## APPLICATION FOR MATERIAL LICENSE

**INSTRUCTIONS: SEE THE APPROPRIATE LICENSE APPLICATION GUIDE FOR DETAILED INSTRUCTIONS FOR COMPLETING APPLICATION. SEND TWO COPIES OF THE ENTIRE COMPLETED APPLICATION TO THE NRC OFFICE SPECIFIED BELOW.**

**APPLICATION FOR DISTRIBUTION OF EXEMPT PRODUCTS FILE APPLICATIONS WITH:**

DIVISION OF INDUSTRIAL AND MEDICAL NUCLEAR SAFETY  
OFFICE OF NUCLEAR MATERIALS SAFETY AND SAFEGUARDS  
U.S. NUCLEAR REGULATORY COMMISSION  
WASHINGTON, DC 20555-0001

**ALL OTHER PERSONS FILE APPLICATIONS AS FOLLOWS:**

**IF YOU ARE LOCATED IN:**

CONNECTICUT, DELAWARE, DISTRICT OF COLUMBIA, MAINE, MARYLAND,  
MASSACHUSETTS, NEW HAMPSHIRE, NEW JERSEY, NEW YORK, PENNSYLVANIA,  
RHODE ISLAND, OR VERMONT, SEND APPLICATIONS TO:

LICENSING ASSISTANT SECTION  
NUCLEAR MATERIALS SAFETY BRANCH  
U.S. NUCLEAR REGULATORY COMMISSION, REGION I  
475 ALLENDALE ROAD  
KING OF PRUSSIA, PA 19406-1415

ALABAMA, FLORIDA, GEORGIA, KENTUCKY, MISSISSIPPI, NORTH CAROLINA, PUERTO  
RICO, SOUTH CAROLINA, TENNESSEE, VIRGINIA, VIRGIN ISLANDS, OR WEST VIRGINIA,  
SEND APPLICATIONS TO:

SAM NUNN ATLANTA FEDERAL CENTER  
U. S. NUCLEAR REGULATORY COMMISSION, REGION II  
61 FORSYTH STREET, S.W., SUITE 23T85  
ATLANTA, GEORGIA 30303-8931

**IF YOU ARE LOCATED IN:**

ILLINOIS, INDIANA, IOWA, MICHIGAN, MINNESOTA, MISSOURI, OHIO, OR WISCONSIN, SEND  
APPLICATIONS TO:

MATERIALS LICENSING BRANCH  
U.S. NUCLEAR REGULATORY COMMISSION, REGION III  
801 WARRENVILLE RD.  
LISLE, IL 60532-4351

ALASKA, ARIZONA, ARKANSAS, CALIFORNIA, COLORADO, HAWAII, IDAHO, KANSAS,  
LOUISIANA, MONTANA, NEBRASKA, NEVADA, NEW MEXICO, NORTH DAKOTA, OKLAHOMA,  
OREGON, PACIFIC TRUST TERRITORIES, SOUTH DAKOTA, TEXAS, UTAH, WASHINGTON,  
OR WYOMING, SEND APPLICATIONS TO:

NUCLEAR MATERIALS LICENSING SECTION  
U.S. NUCLEAR REGULATORY COMMISSION, REGION IV  
811 RYAN PLAZA DRIVE, SUITE 400  
ARLINGTON, TX 76011-8064

L 30362  
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**PERSONS LOCATED IN AGREEMENT STATES SEND APPLICATIONS TO THE U.S. NUCLEAR REGULATORY COMMISSION ONLY IF THEY WISH TO POSSESS AND USE LICENSED MATERIAL IN STATES SUBJECT TO U.S. NUCLEAR REGULATORY COMMISSION JURISDICTIONS.**

**1. THIS IS AN APPLICATION FOR (Check appropriate item)**

- A. NEW LICENSE  
 B. AMENDMENT TO LICENSE NUMBER \_\_\_\_\_  
 C. RENEWAL OF LICENSE NUMBER \_\_\_\_\_

**2. NAME AND MAILING ADDRESS OF APPLICANT (Include ZIP code)**

Eastern Technologies, Inc.  
P.O. Box 409  
Ashford, AL 36312

**3. ADDRESS WHERE LICENSED MATERIAL WILL BE USED OR POSSESSED**

51 River Road  
Berwick, PA 18603

**4. NAME OF PERSON TO BE CONTACTED ABOUT THIS APPLICATION**

Mark Fellows

**TELEPHONE NUMBER**

(334) 899-4351

SUBMIT ITEMS 5 THROUGH 11 ON 8-1/2 X 11" PAPER. THE TYPE AND SCOPE OF INFORMATION TO BE PROVIDED IS DESCRIBED IN THE LICENSE APPLICATION GUIDE.

**5. RADIOACTIVE MATERIAL**

a. Element and mass number; b. chemical and/or physical form; and c. maximum amount which will be possessed at any one time.

**6. PURPOSE(S) FOR WHICH LICENSED MATERIAL WILL BE USED.**

**7. INDIVIDUAL(S) RESPONSIBLE FOR RADIATION SAFETY PROGRAM AND THEIR TRAINING EXPERIENCE. (Medical use applicants: Complete NRC Form 313A)**

**8. TRAINING FOR INDIVIDUALS WORKING IN OR FREQUENTING RESTRICTED AREAS.**

**9. FACILITIES AND EQUIPMENT.**

**10. RADIATION SAFETY PROGRAM.**

**11. WASTE MANAGEMENT.**

**12. LICENSE FEES (See 10 CFR 170 and Section 170.31)**

FEE CATEGORY 6 AMOUNT ENCLOSED \$ 12,600.00

**13. CERTIFICATION. (Must be completed by applicant) THE APPLICANT UNDERSTANDS THAT ALL STATEMENTS AND REPRESENTATIONS MADE IN THIS APPLICATION ARE BINDING UPON**

THE APPLICANT AND ANY OFFICIAL EXECUTING THIS CERTIFICATION ON BEHALF OF THE APPLICANT, NAMED IN ITEM 2, CERTIFY THAT THIS APPLICATION IS PREPARED IN CONFORMITY WITH TITLE 10, CODE OF FEDERAL REGULATIONS, PARTS 30, 32, 33, 34, 35, 36, 39, AND 40, AND THAT ALL INFORMATION CONTAINED HEREIN IS TRUE AND CORRECT TO THE BEST OF THEIR KNOWLEDGE AND BELIEF.

WARNING: 18 U.S.C. SECTION 1001 ACT OF JUNE 25, 1948 62 STAT. 749 MAKES IT A CRIMINAL OFFENSE TO MAKE A WILLFULLY FALSE STATEMENT OR REPRESENTATION TO ANY DEPARTMENT OR AGENCY OF THE UNITED STATES AS TO ANY MATTER WITHIN ITS JURISDICTION.

**CERTIFYING OFFICER - TYPED/PRINTED NAME AND TITLE**

Mark Fellows - Vice President

**SIGNATURE**

*Mark Fellows*

**DATE**

1/29/04

**FOR NRC USE ONLY**

TYPE OF FEE	FEE LOG	FEE CATEGORY	AMOUNT RECEIVED	CHECK NUMBER	COMMENTS
			\$		
APPROVED BY				DATE	134442

## **Application for Material License**

### **5. Radioactive Material**

#### **A. Element & Mass Number**

1. Any radioactive material with atomic numbers 1-83.
2. Any radioactive material with atomic numbers 84-102.
3. Natural or depleted uranium or natural thorium.
4. Uranium 235, Uranium 233, Plutonium.
5. Plutonium 238.
6. Cesium 137  
Technetium 99  
Strontium 90  
Cobalt 60

#### **B. Chemical and/or Physical Form**

1. Metal oxides contained within processing equipment as contamination. Contaminated garments, equipment, protective devices and associated decontamination waste.
2. Metal oxides contained within processing equipment as contamination. Contaminated garments, equipment, protective devices and associated decontamination waste.
3. Metal oxides contained within processing equipment as contamination. Contaminated garments, equipment, protective devices and associated decontamination waste.
4. Metal oxides contained within processing equipment as contamination. Contaminated garments, equipment, protective devices and associated decontamination waste.

5. Calibration and reference sources authorized for distribution by the USNRC.

6. Calibration and reference sources authorized for distribution by the USNRC.

C. Maximum Quantity

INFORMATION IMPORTANT TO SECURITY OF RADIOACTIVE MATERIAL HAS BEEN REMOVED BY THE NRC. A COMPLETE COPY OF THE DOCUMENT CAN BE FOUND AT ADAMS ACCESSION NO. ML040510525.

6. Purpose(s) For Which Licensed Material Will Be Used

For the collection, laundering, processing and/or decontamination of contaminated clothing, Orex material, non-apparel items, respiratory protection equipment and other such non-launderable, non-apparel items that are used in conjunction with a protective clothing program. Storage of protective clothing, associated items, and related shipping/transportation equipment.

7. Individual Responsible For Radiation Safety Program

Mark Fellows is designated as Radiation Safety Officer. Training and experience detailed in attached resume.

8. Training For Individuals Working in/or Frequenting Restricted Areas

See enclosed certifications.

## 9. Facilities And Equipment

### A. Facility Description

#### 1. General Facility Description

The complete structure is 202 feet square with a footprint of 40,804 square feet. Approximately 16,770 feet of the structure will comprise the RCA consisting of the laundry itself, radioactive material shipping and receiving, material sorting area, managers office, HP office and lab, waste water processing and filtration area and gender designated rest rooms and showers. The balance of the structure (24,034 ft<sup>2</sup>) will be utilized as a warehouse for new commercial goods, warehouse management offices, bathrooms and break area. Please review attachments for facility diagram.

Protective clothing maintained by ETI for the purpose of leasing will be stored within the RCA in a mezzanine area located over the Radioactive Material Shipping and Receiving Area. All areas of the facility will be protected by water sprinkler type fire suppression systems.

The facility utilizes concrete and steel walls, steel support structure and roofing and concrete floor. The liquid retention sump (55' X 30' X 12') of the Water Processing and Filtration Area is also constructed from concrete.

#### 2. Material Receipt Area

The Radioactive material shipping and receiving area is a 75' long by 30' wide enclosed area that is part of the laundry facility and thus within the primary RCA. Typically all incoming and out going material will be surveyed, unloaded or loaded in this area. Seven loading docks will facilitate efficient material unload and reload. Inner containers of incoming soiled

items will not be opened in this area. It will be designated a Radiation Area and a Radioactive Materials Area but will not be maintained as a contaminated area.

### 3. Material Storage

Protective clothing and associated items maintained by ETI for lease purposes will be stored in a 20' by 75' mezzanine area located over the top of the Radioactive Material Shipping and Receiving Area. Appropriate fire suppression systems will be installed.

Protective clothing and associated items maintained by ETI for worker protection will be stored within the bathroom and shower areas. Appropriate fire suppression systems will be installed.

### 4. Security

All radioactive material will be stored within the walled RCA and fenced Owner-Control Area. Radioactive material located outside the RCA in the Owner-Controlled Area will be stored within shipping vehicles or other enclosures capable of being locked to prevent unauthorized entry.

### 5. Material Monitoring, Preparation and Handling Area

The portion of the facility beginning at the discharge point of the dryers and continuing to the RCA entry/exit hall way and containing the Automated Laundry Monitors is considered the Material Monitoring, Preparation and Handling Area. This area is approximately 75' long by 60' wide (4,500 ft<sup>2</sup>).

Laundered/processed items will be prepped, surveyed, folded and packaged in this area for return to the customer. Depending upon customer preference the items will be placed in bags, baskets, boxes or any combination thereof and readied for return shipment to the originating facility.

## 6. Waste Storage

All non-launderable and non-conforming material contained within laundry/Orex shipments will be returned to the originating facility. By-product material produced as a result of the decontamination and wastewater filtration process will typically be handled by ETI. By-product material will be dried to remove excess moisture via industrial dryer or other suitable process, packaged and then loaded into one of ETI's sea/land type containers for temporary storage and subsequent shipment to a waste processor.

## 7. Measurement of Radioactive Materials

### a. Incoming Shipments

Exterior surveys of incoming shipments will typically be performed inside the fenced owner-controlled area. Survey of internal boxes or bags of material will typically be performed inside the vehicle prior to or in tandem with unloading the material from the vehicle or in the Radioactive Material Shipping and Receiving Area after unloading from the trailer. All items are surveyed prior to being placed into the sorting area. It should be noted that ETI contractually limits its' customer to individual package dose rates of  $\leq 50$  mr/hr. Individual packages exceeding 50 mr/hr will not be opened and will be returned unopened to the originating facility.

### b. Outgoing Shipments

Individual bags or containers of processed items being prepared for return shipment to customers will typically be surveyed in the Material Monitoring Preparation and Handling Area prior to placement into the Radioactive Material Shipping and

Receiving Area. Typically each bag or container of material is surveyed and tagged prior to loading into the shipment vehicle. External survey of the shipment vehicle and container used for return of processed items to customers will typically be performed within the fenced Owner-Controlled Area.

## B. Facility Equipment

### 1. Laundry Equipment

The facility will contain up to six (6) industrial washer extractors. These machines will have capacities ranging from 125 to 450 pounds of launderable material. A like number of industrial dryers will be employed for moisture removal from material processed by washer extractors. As one of the washer extractors is only employed for the extraction of free liquid, a press may be employed as a substitute should operational considerations dictate.

Lint removal from the dryers will be accomplished via a common system of one or more wet type lint collectors located above the dryers. All dryer exhaust will pass through the wet type lint collectors where the lint will be removed from the exhaust air. Captured lint will automatically be flushed to the wastewater processing system for automatic removal eliminating the potential for air borne contamination. Air leaving the wet type lint collectors will be further processed by a HEPA filtration system prior to release to the environment. An appropriate isokinetic air sampling port will be installed within the exhaust duct just prior to the atmospheric release point. Fire suppression systems will be installed in all dryer exhaust duct and systems as well as appropriate sections of the dryers themselves.

Additional equipment utilized will include automated laundry monitors (ALM's). ALM's will be utilized for the post

processing survey of protective clothing and associated items. Up to five (5) of these machines will be utilized. Mechanical components of the ALM'S are designed and constructed by ETI. Companies such as Shonka Research Associates, Eberline, etc. provide electronic components utilized.

## 2. Orex Decontamination Systems

The facility will contain up to two (2) MB600 Orex Decontamination Systems. Each MB600 has a processing capacity of  $\geq 600$  pounds of Orex protective clothing and associated products. Each MB600 is equipped with a heat exchanger for process temperature control. As potentially contaminated liquid will pass through these heat exchangers both will be located within the RCA. Exhaust air from each heat exchanger will be HEPA filtered prior to release to the environment. An appropriate isokinetic air sampling port will be installed just prior to the atmospheric release point.

## 3. Soiled Material Handling Equipment

Bags and boxes of incoming material will be transported in such a manner as to reduce worker injury. Loose bags of material will typically be transported via overhead rail system, pushcart and fork cart. Boxes of material will typically be transported via fork truck. Other methods and equipment may be employed to increase worker efficiency and or reduce the chance of worker injury. Appropriate health physics considerations will be followed.

Sorted material will typically be transported to the washer extractors and processing area by overhead rail system. Additional methods may include but not be limited to pushcarts or other device designed to reduce worker injury and or increase worker efficiency.

## 4. Laundered Material Handling Equipment

Laundered items removed from washer extractors will typically be transported to and placed into the industrial dryers via mechanized conveyers. After drying, processed items may be transported to the monitoring area by additional conveyer systems or pushcarts and/or other devices. Please review enclosed video for examples of proposed methods.

#### 5. Sorting Equipment

Soiled protective clothing and associated items will be sorted to remove non-conforming material and separate the items for appropriate processing. Sorting will be performed via utilization of down draft or cross draft sorting tables/devices (sorting equipment). Sorting equipment will maintain sufficient negative airflow to greatly reduce or eliminate the potential for personnel uptakes due to the handling of soiled and or contaminated material. Negative airflow for sorting equipment will be provided by a HEPA filtered negative pressure unit. Exhaust from the negative pressure unit will be ducted outside of the sorting area there by creating a negative pressure situation in the area and thus eliminating or greatly reducing the spread of loose contamination dislodged during the sorting process. Breathing air quality will be monitored by a low volume air sampler with a remote intake and filter located appropriately to sample breathing air quality.

#### C. Wastewater Filtration System

All non-sanitary water generated at the facility will be processed by ETI's wastewater filtration system. The source of this wastewater includes, but may not be limited to wet type lint collectors, floor drains, showers, sinks, washer extractors, presses, and Orex decontamination systems. All systems will route liquids to the Primary Liquid Radwaste Collection Tank. From that tank the liquid will be processed through increasingly restrictive stages of micro filtration prior to sampling and placement into one or more of the four 10,000 gallon Filtered Wastewater Holding Tanks. After analysis, to ensure compliance with applicable release criteria, the liquid will be

released to the environment or re-filtered should analysis determine that additional processing is necessary.

The environmental release point of the facility for liquid effluent is the Susquehanna River. Minimum flow rate over 97 years for the river, at or close to the proposed discharge point, is 11,221 gallons per second (673,260 gallons per minute). Mean flow rate for the same 97 year time period is 128,149 gallons per second (7,688,940 per minute). ETI reserves the right to update, upgrade and modify the wastewater filtration system to increase efficiency, increase its' ability to remove radioactive material or other such goals to ensure compliance with applicable regulations and ALARA principles.

#### D. Protective Clothing

ETI will utilize both launderable and single use protective clothing. These items will include but may not be limited to: coveralls; hoods; cloth shoe covers; lab coats; rubber shoe covers; rubber gloves. Plastic single use and launderable bags will also be available for storage of soiled protective clothing and waste items.

Unless required in specific instances, respirators will not be utilized. ETI will utilize engineering controls to eliminate the need for respirators. Should engineering controls fail, adequate respiratory protection will be utilized until the area can be returned to a non-airborne area. These respiratory protection devices may include but not be limited to: respirators, SCBA devices, air line feed positive pressure breathing devices.

#### E. Specialized Tools and Interlocks

Various tools and interlocks will be utilized to ensure proper operation of various radiological protection systems.

There are two main systems that protect against the release of unmonitored radioactive material to the environment. They are the Dryer Exhaust Air Filtration System and the Wastewater Collection and Filtration System.

The Dryer Exhaust Filtration System employs HEPA filtration and computerized controls and interfaces to ensure proper filtration of dryer exhaust air. As the system is a closed system and no provisions exist for bypass of the system very little possibility exists for system failure or improper system use. System failure or improper use would result in increased dry times on launderable items, due to reduced air flow caused by the HEPA filters without a properly operating helper blower, but would not result in unfiltered release unless HEPA failure occurred.

The computerized controls and interfaces on the Dryer Exhaust Filtration System prevent operation of dryers unless all components of the system are operating. This includes but may not be limited to air samplers/monitors, fire suppression systems, helper blower, emergency stop switches, system pressure and fire alarms. As currently programmed dryers may not be operated unless the filtration system is operating and all interfaces read satisfactory conditions.

To further ensure system safety, activation of any emergency stop control by personnel or automatic or manual activation of the fire suppression system automatically shuts down all related equipment, (i.e.: dryer, helper blower) closes an electrically activated damper to seal the system from and environmental release, and activates high volume audible alarms to notify all surrounding personnel.

The Wastewater Collection and Filtration System is the second major system preventing unfiltered an/or unmonitored radioactive material from release to the environment. This system is also designed to be fail-safe as no bypass provisions are provided.

All non-sanitary water (i.e.: sinks, showers, floor drains, laundry wastewater) produced in the facility is collected by this system for treatment and released (see enclosed system diagram). No operator interface is required for collection and consolidation of the various streams of water. All non-sanitary water is hard piped into a common collection system. Wastewater collected is automatically pumped through the various filtration stages of the system, samples collected and placed into holding tanks awaiting analysis and release. Audible

alarms are utilized to warn operators of high tank levels. All processing equipment is located in or directly over a safety collection reservoir should some system fail and water be released into the facility from the wastewater filtration system. The reservoir has a capacity of 148,123 gallons. At full system flow it would take approximately 31 hours to fill the reservoir and cause an unmonitored release to the environment. Dual alarm systems are installed in the reservoir to alert personnel of the presence of water.

An audible alarm activates within the facility to notify personnel that water is being collected by the emergency reservoir. Simultaneously an automatic phone notification system pages appropriate personnel of the condition. Pumps are installed in the reservoir to remove the water and place it into the collection and filtration system after the leak has been corrected.

Only one flow path is allowed for water discharged to the environment. All water must flow past the sample collection point and into one of the holding tanks prior to release. No other system is available for release of non-sanitary water.

#### 10. Radiation Safety Program

See enclosed procedures.

#### 11. Waste Management

See enclosed certification.

## 8.7.2 Authorized Users

Before using licensed material, authorized users will receive the training described in Appendix H in NUREG-1556, vol. 18, 'Consolidated Guidance About Materials Licenses: Program-Specific Guidance About Service Provider Licenses,' dated November 2000.

### 8.7.3 Ancillary Personnel

Before using licensed materials, ancillary personnel will have successfully completed the Classroom Training portion of the training course described in Appendix H in NUREG-1556, Vol. 18, 'Consolidated Guidance About Materials Licenses: Program-Specific Guidance About Service Provider Licenses,' dated November 2000.

## 8.10.2 Radiation Monitoring Instruments

### A. Instrument Availability

<b>Instrument Type</b>	<b>Model No. or Equivalent</b>	<b>Detector</b>	<b>Radiation Detected</b>	<b>Minimum Quantity on Hand</b>
<b>Portable</b>				
Dose Rate	RO-20	Ion Chamber	B, G	2
Dose Rate/Frisker Counter	ASP-2	GM	B, G	1
Frisker	RM25	GM	B, G	4
Frisker/Counter	ASP-2	ZnS	A	1
Pocket Ion Chamber (PIC)	NA	Ion Chamber	G	Note 2
<b>Stationary</b>				
Counter	HandECount	ZnS	A	1
Counter	Mini Assay 6-20	NaI	B, G	1
Counter	Canberra	NaI	G	1
Whole Body Contam. Monitor	PCM-1B	Gas Flow	B, G	1
Whole Body Counter	PM-7	Plastic Scintillator	G	1

- Notes: 1. Equivalent Instrument and detector system may be substituted.
2. Minimum quantity of PIC's on hand will be based on employee and visitor load. A minimum of one PIC or equivalent instrument, plus sufficient reserve, will be maintained for each current rad worker. Additional instruments will be maintained to allow for maintenance and calibration.

### B. Certification

"We will use instruments that meet the radiation monitoring instrument specifications published in Appendix J to NUREG-1556, Vol. 18, 'Consolidated Guidance about Materials License: Program-Specific Guidance about Service Provider Licenses,' dated November 2000. Additionally, we will implement the model survey meter calibration program published in Appendix J to NUREG-1556, Vol. 18, 'Consolidated

Guidance about Materials Licenses: Program-Specific  
Guidance about Service Provider Licenses,' dated  
November 2000. We reserve the right to upgrade our  
survey instruments as necessary."

It should be understood that although ETI will calibrate  
many types of instrumentation, we will not calibrate  
instruments utilized for measurement of dose rate. Dose  
rate instruments will be calibrated by the manufacture or  
other such qualified facility.

### 8.10.3 Material Receipt and Accountability

Ordering licensed material and package receipt and opening will follow model procedures in NUREG-1556, Vol. 18, Appendix K, where applicable.

For unsealed material ETI has a procedure detailing required surveys and actions for incoming shipments of radioactive material. The procedure details surveys required for external vehicle contamination and dose rate surveys as well as internal package contamination and dose rate surveys where applicable. Also detailed are appropriate responses and notification requirements for shipments or packages not meeting DOT requirements or ETI administrative guideline, for incoming shipments.

#### 8.10.4 Occupational Dose

ETI will monitor individuals in accordance with the criteria in the section entitled Occupational Dose in NUREG-1556, Vol. 18, Consolidated Guidance about Material licenses: Program Specific Guidance about Service Provider Licenses, dated November 2000.

ETI will also provide a bioassay program capable of properly monitoring personnel in compliance with Regulatory Guide 8.20. In addition all personnel will wear NVLAP accredited dosimetry (film badge, TLD, OSL, etc.) and that dosimetry will be processed by a NVLAP accredited entity. NVLAP accredited dosimetry will be exchanged at the frequency specified in Section 8.10.4 of NUREG-1556, Vol. .18.

8.10.6

**Safe Use of Radionuclides And Emergency Procedures**

ETI will follow the manufacturer's procedures for inspection, maintenance, source exchange, and operations that involve access to the sealed sources(s) and safety system, if applicable. Pertinent procedures supplied as part of this license request.

8.10.7      **Surveys**

We will survey our facility and maintain levels in accordance with the survey frequencies and contamination levels published in NUREG-1556, Vol. 18 "Program Specific Guidance About Service Provider Licenses" dated November 2000. Specific procedures are also supplied as part of this license request.

#### 8.10.8 Leak Tests

Leak testing will follow the model procedures in NUREG-1556, Vol. 18, Appendix O, where applicable.

## 8.11 Waste Management

ETI will use the model waste procedures published in Appendix N of NUREG-1556, Vol. 18, "Consolidated Guidance About Materials Licenses: Program Specific Guidance About Service Provider Licenses", dated November 2000. Additional applicable procedures have been included as part of this license request.

**PROPOSED LAUNDRY FACILITY DRAWING  
(Dwg. No. PF001, Revision 1)**

**REMOVED**

INFORMATION IMPORTANT TO SECURITY OF RADIOACTIVE MATERIAL HAS BEEN  
REMOVED BY THE NRC. A COMPLETE COPY OF THE DOCUMENT CAN BE FOUND AT  
ADAMS ACCESSION NO. ML040510525.

**PROCESS AREA DRAWING  
(Dwg. No. PF002, Revision 1)**

**REMOVED**

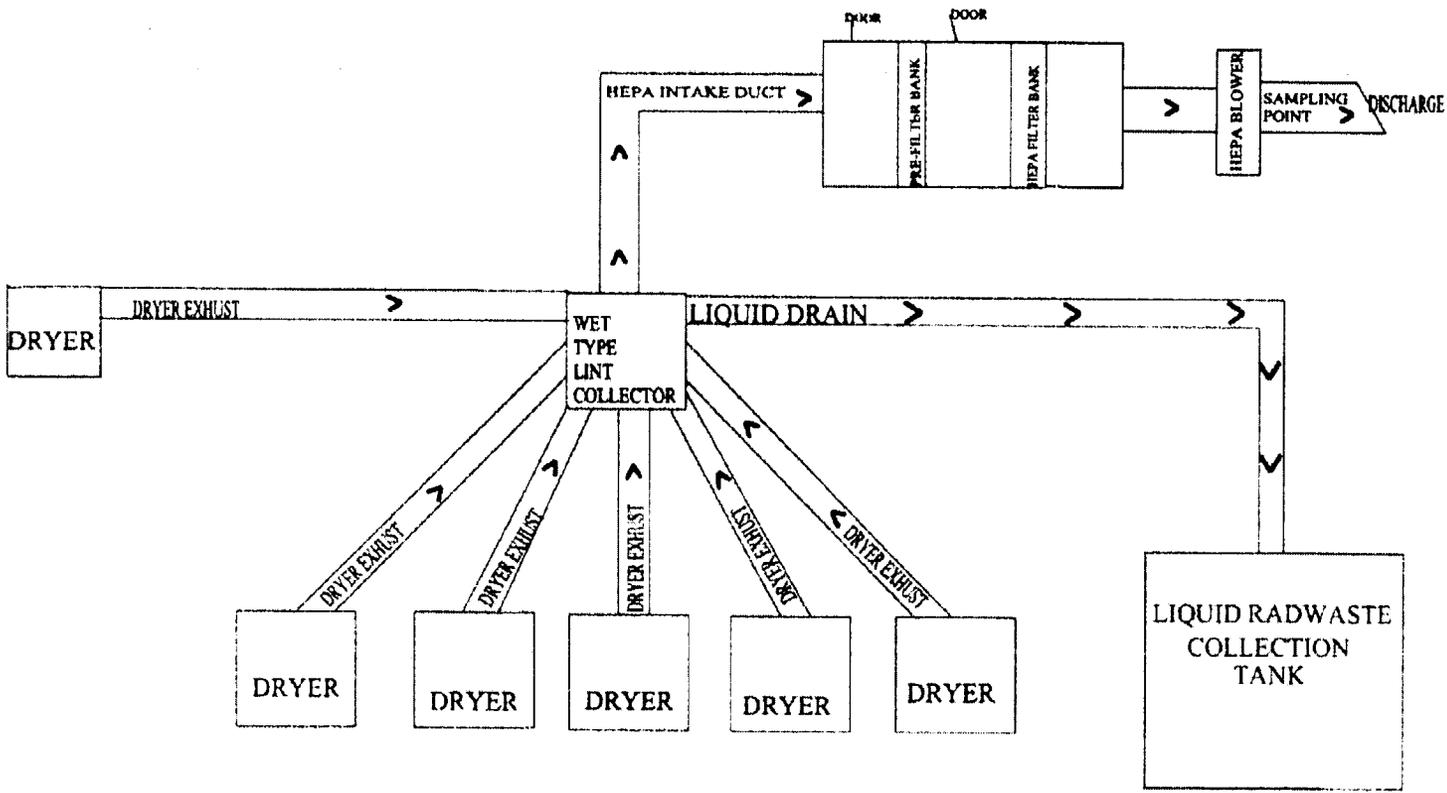
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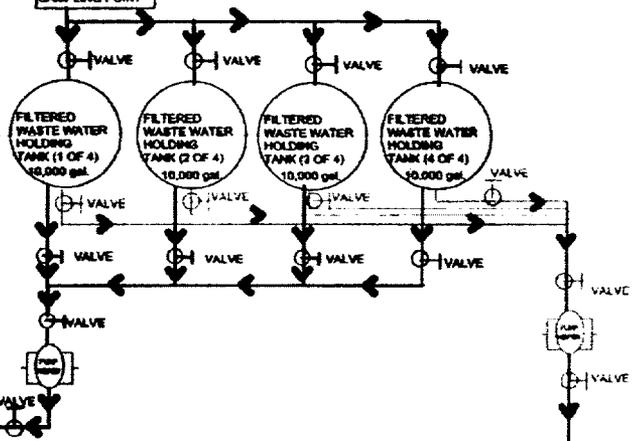
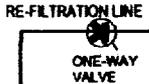
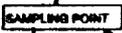
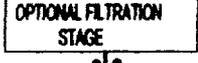
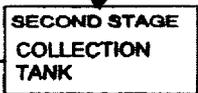
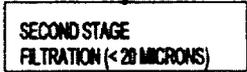
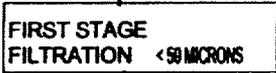
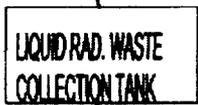
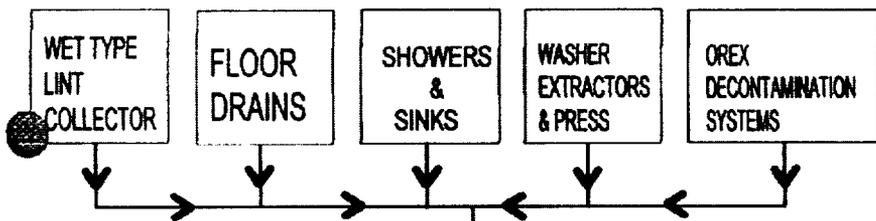
**FLOOR DRAINS DRAWING  
(Dwg. No. PF003, Revision 1)**

**REMOVED**

INFORMATION IMPORTANT TO SECURITY OF RADIOACTIVE MATERIAL HAS BEEN  
REMOVED BY THE NRC. A COMPLETE COPY OF THE DOCUMENT CAN BE FOUND AT  
ADAMS ACCESSION NO. ML040510525.

Drawing No. PF004 Revision 1
Title: Dryer Exhaust Filtration & H.E.P.A. System
Date 01/29/2004
Scale: N/A
Applicant: Eastern Technologies, Inc.





Drawing No. PF005 Revision 1
Title: Liquid Rad Waste Collection & Filtration Flow Chart
Date 01/29/2004
Scale: N/A
Applicant: Eastern Technologies, Inc.

**PROPERTY BOUNDARIES DRAWING  
(Dwg. No. PF006, Revision 1)**

**REMOVED**

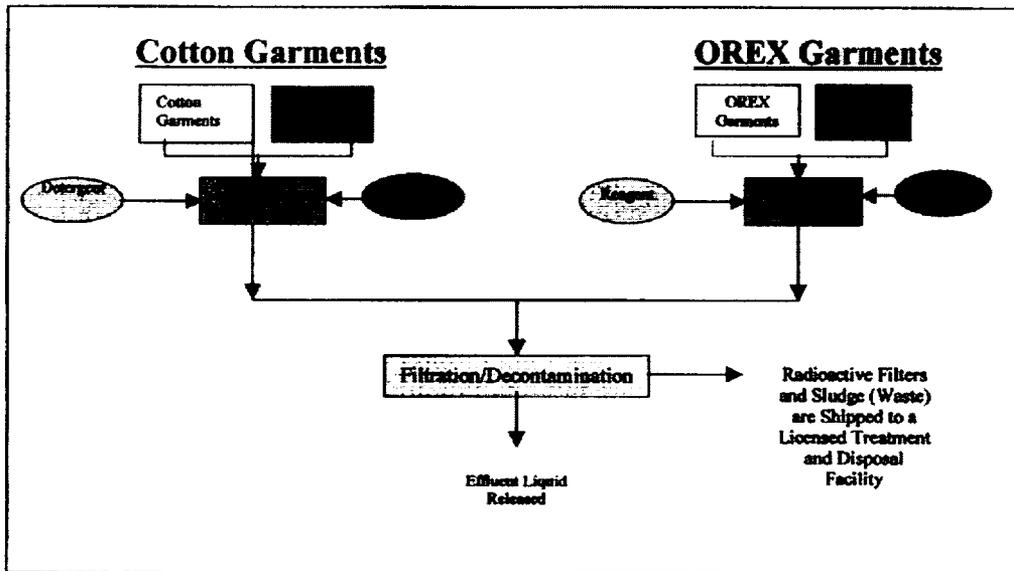
INFORMATION IMPORTANT TO SECURITY OF RADIOACTIVE MATERIAL HAS BEEN  
REMOVED BY THE NRC. A COMPLETE COPY OF THE DOCUMENT CAN BE FOUND AT  
ADAMS ACCESSION NO. ML040510525.

## OREX Decontamination Process Overview, History and Current Position

The OREX treatment process is a decontamination and release process. Radioactive contamination is removed and the remainder of material released. Any items, materials or components not able to be decontaminated and released are returned to the licensee or transferred to a licensed waste processor for final disposition. Radioactivity is removed via multiple filtration stages by the Eastern Technology Inc. (ETI) facility water treatment system. This common water treatment system is used to treat both traditional laundry and OREX processing equipment effluents in an identical fashion. Radioactivity from both traditional laundry and OREX is deposited on the same filters. The filters and associated sludge, lint, etc., becomes the laundry vendor's (ETI's) "secondary" waste.

Prior to year 2001, several vendors attempted to develop a means to process OREX or polyvinyl alcohol (PVA) based materials. All previous attempts failed to produce a technically or commercially viable means to process such material. One of the primary reasons was the technical limitation that would have led to the generation of increased amounts of radioactive waste. All previous attempts simply solubilized the PVA materials, i.e., converting them from a solid form to a liquid state. Liquid PVA does not filter effectively due to its high viscosity and other properties. Therefore, vendors making these earlier attempts came to the conclusions that processing radioactively contaminated PVA materials was not economically viable due to reduced facility throughputs, significant increases in filter loading from PVA solids and the corresponding significant increased production of low level radioactive waste which would have occurred. Those previous PVA processing challenges have recently been solved and a very effective decontamination process now exists for PVA based materials. The process in place today at the ETI facility does not result in a liquefied PVA effluent stream, as did all the pre-2001 attempts.

### Current Treatment Process Flow



Currently, there are several radioactive laundry facilities licensed and operating in the United States. These facilities receive radioactive garments and other items from nuclear power stations for decontamination. The items have been historically manifested and shipped as "radioactive material". The items vary from cloth garments, bags, rubber goods, tarping materials and decontamination supplies such as mops, rags, etc. The service companies remove radioactive contamination from the garments and materials and collect it on filter media. The quantity of radioactivity removed and collected is a small value when compared to the activities reported by the commercial generators (power plants) on their respective annual effluent reports. Allocating the activity among various generators is not easily accomplished, burdensome and provides no health and safety value. As a result, the filter media and sludges generated during these decontamination processes have historically been considered a "secondary" waste to the treatment facility and are subsequently transferred to a licensed waste processor for ultimate disposition.

A number of licensed treatment vendors receive various forms of radioactive materials, ie, metals, components, etc., from power plants and other facilities. At the present time, the Nuclear Regulatory Commission (NRC) considers all radioactive shipments from nuclear plants to vendors as radioactive material. For example, metal is shipped to Duratek routinely and effectively results in 100% volume reduction to the generator. The rationale is, according to Duratek, that metal, which cannot be released to local landfills or salvaged, is melted, thereby resulting in a 100% volume reduction to the generator. Of course, there is certainly waste that results from this process in the form of slag, and is considered "secondary" waste. With few exceptions, almost every processor or vendor creates secondary waste in the form of grit blast media, rags, used protective clothing, laundry filters, laundry resins, laundry evaporator bottoms, precoat media, slag, and other vendor-specific wastes. These wastes are never credited to the waste generator. This is reasonable considering that such residues left over from the process cannot be associated with any specific plant (e.g., filter waste, slag, resin). Similarly, Unitech and Eastern Technologies Incorporated (ETI) generate secondary wastes from their respective decontamination processes that are certainly usually not traceable to the specific generator, including incidental waste found in the laundry. However, if the quantity or volume exceeds some small amount and the material is specific to one generator, then the laundry vendor charges it back to the utility and will either ship it back to the generator or ship it to a waste processor. Specific actions are contract-specific. Of course, all leased clothing that is damaged and finally dispositioned is considered as secondary waste. This applies in the same manner to anything else that any processor or vendor leases to utilities, such as scaffolding, lead blankets, and other outage equipment that becomes radioactively contaminated. Materials or items that are processed for decontamination may or may not be reusable following the decontamination processes and these items are, in many cases, released for unrestricted use, sent for salvage value or alternatively returned to the generator for disposition. The radioactivity removed during the decontamination processes is very often not proportioned back to the generator and is instead appropriately managed as "secondary waste" by the processor.

It is important to note that OREX clothing is a substitute for traditional cotton or poly/cotton garments. Therefore the total amount of radioactivity present is divided between both OREX and traditional cloth garments and there is no net increase in radioactive constituents. In other words, the combined number of protective clothing dressouts in the nuclear industries supported by these service vendors still occurs and does not increase. Therefore the quantity of final radioactive waste to be dispositioned, i.e., filter media and sludge, does not increase. Prior to 2001, any attempts to incorporate OREX or polyvinyl alcohol (PVA) garments or materials into the nuclear industry were not technically feasible. There was no process means available to decontaminate the resulting product. Prior to 2001 several vendors tried to develop processing capabilities and all of these attempts failed based on the approach to simply dissolve the PVA materials. Liquified PVA does not filter effectively and therefore cannot be decontaminated in this fashion as those vendors found out then. Any attempts to process or discharge it would have resulted in significant increases in the final radioactive waste products handled by these vendors.

Recently, the Electric Power Research Institute (EPRI) completed a comprehensive evaluation of the OREX technology and processing capabilities currently in place at the ETI facility. A draft report (EPRI Report #TR-1003435) has been issued and the results of this evaluation were very positive technically and economically for application of this technology in the nuclear industry. The OREX technology is gaining rapid, widespread interest from the commercial nuclear sector as many plants are recognizing the true benefits of this technology during plant operations and maintenance activities.

Combinations of launderable cotton or poly/cotton garments, launderable OREX garments, rubber goods, single-use OREX clothing and vendor leased items are interchangeable in the field environment and are shipped collectively by the utilities to the service vendor for treatment. Separating the single-use items and manifesting and shipping them separately would be impractical for a number of reasons:

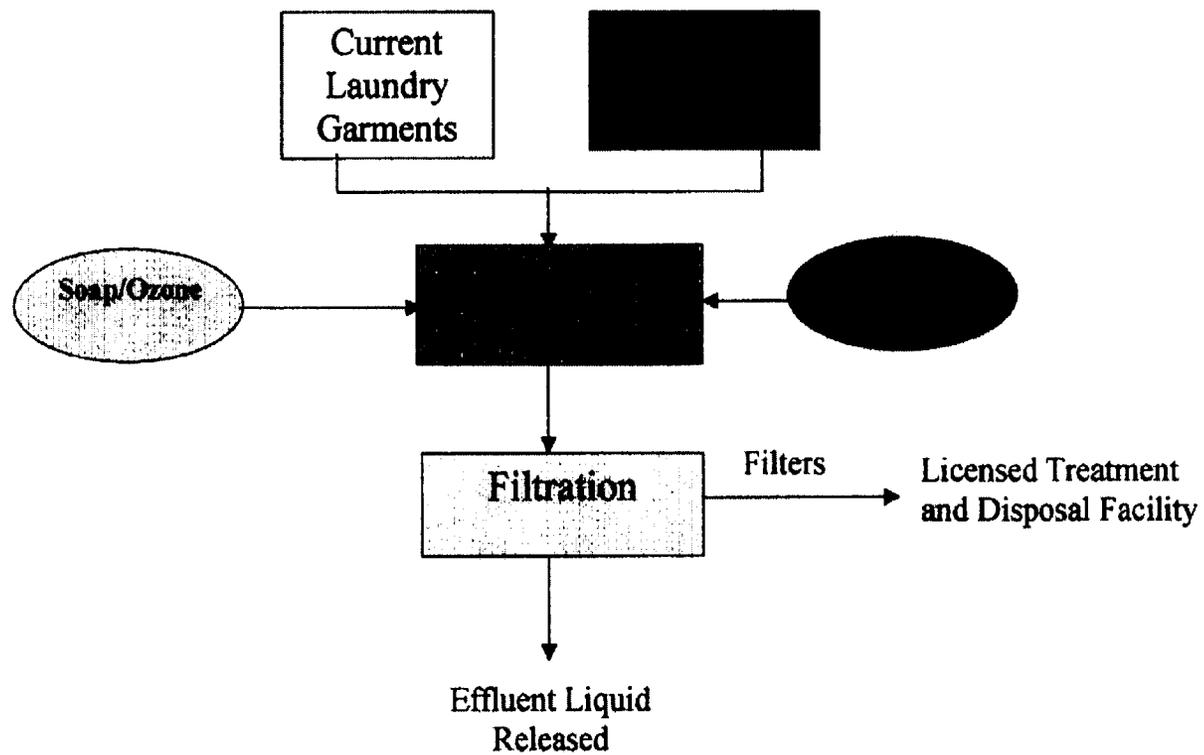
- The number of total shipments would increase without a corresponding increase in total activity over historical values. Increasing the number of shipments increases transportation risks. It also increases the cost to the generators.
- There is no net increase in the quantity of radioactivity by virtue of simply substituting OREX for traditional products. Therefore past acceptable means to manage these relatively low levels of activity should still apply and be acceptable. The final activity is still accounted for as secondary waste by the vendor and is ultimately packaged, manifested and shipped in accordance with regulations as "waste" to a vendor or facility specifically licensed to disposition that activity. All of the activity is either returned to the generator or transferred to another licensee for final disposition. The laundry service vendor is not performing any final dispositioning of any radioactivity above release levels.
- Use of OREX actually reduces the amount of radioactivity material being transported, which minimizes total risk. Current launderable items retain measurable amounts of activity following processing and are thus always shipped as radioactive material wherever they are destined, in all cases. OREX single-use items are non-radioactive until used and therefore do not pose a risk when being shipped to facilities for use.
- There is no radioactive waste material involved with the use of OREX beyond what is currently generated with launderable garments. There is no net increase in ultimate radioactive waste volumes over current practices.
- OREX products are manufactured in launderable and single-use versions with applications for both. Segregation after use solely for transportation purposes would be impractical. Especially when both will be processed at the same facility. The activity levels are indiscernible between launderable and single-use products and commensurate with traditional cotton garments. The activity is removed in a common decontamination process and all activity is deposited on common filter media without discrimination as to source of generation.

#### Some Differentiation Among "Decontamination Facilities" and "Waste Processors"

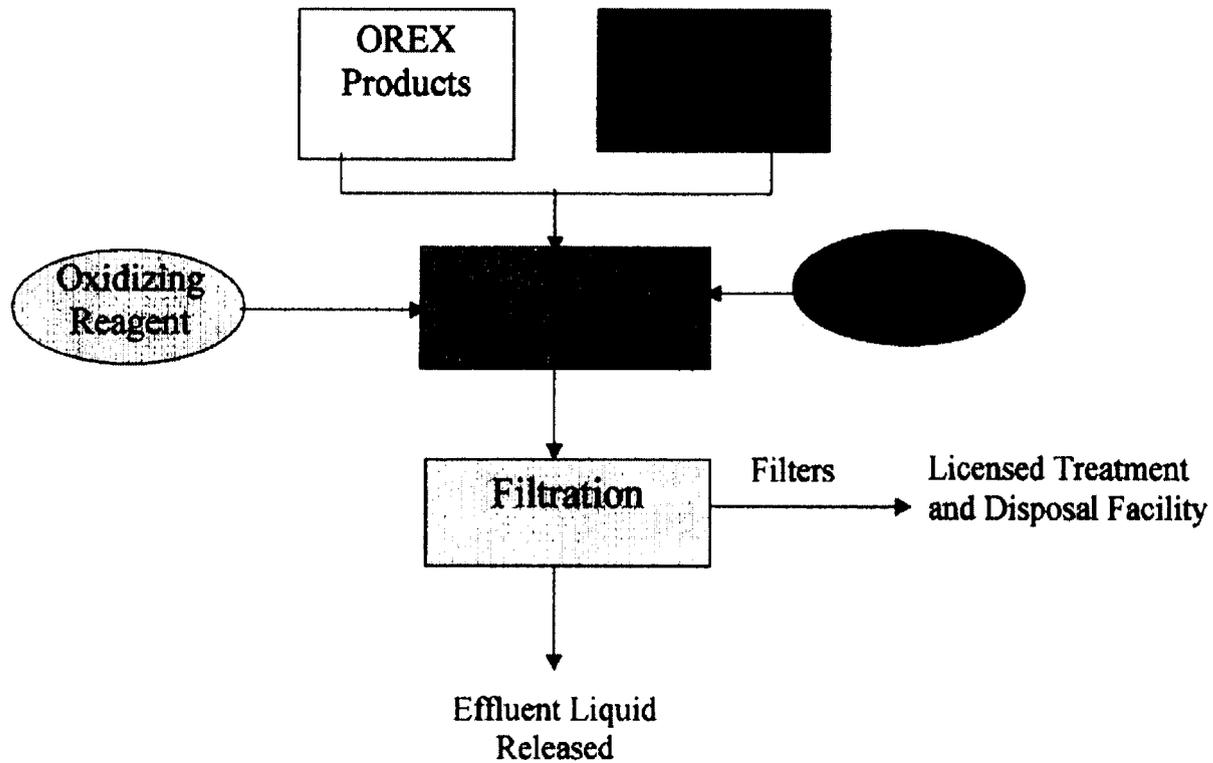
- **Decontamination Facilities**
  - Focus is on removing radioactivity from material for release or reuse.
  - Radioactivity removed is "secondary" waste.
- **Waste Processors**
  - Focus is on final disposition or burial as radioactive material.
  - May use volume reduction to reduce total volume but not radioactivity.

Prepared by: John B. Steward, CHP  
July 25, 2002

**Current ETI**  
**PROCESS FLOW**  
**DIAGRAM**



Orex  
**PROCESS FLOW DIAGRAM**



**ETI Management Structure**

**President**

**Vice President**

**Plant Manager      HP Supervisor**

**Assistant Plant Manager      HP Technicians/Foreman**

**Radiation Workers**

## MARK S. FELLOWS

[REDACTED]

**Present Position:** Vice-President - Eastern Technologies, Inc.

- Education:**
- (A) Radiation Safety Practices, Respiratory Protection Training and Re-Training at over eight (8) different nuclear power facilities.  
\*Continuing training. Year to date totals exceed 500 hours.
  - (B) Health Physics Instruments and Air Monitors, Eberline Instrument Company.  
\*Consisted of 40 hours of classroom study and practical application.
  - (C) Advanced Low Level Radioactive Waste Transportation and Disposal, Chem-Nuclear Systems, Inc.
  - (D) Radioactive Waste Packaging, Transportation and Disposal, Chem-Nuclear Systems, Inc.  
\*Consisted of 40 hours of classroom study.
  - (E) Bachelor of Science, Business Administration Management, Auburn University.

**Work Experience in Nuclear Industries:**

**ETI**                      **Vice President**    **Ashford, AL**

**Job Description:** Involved in design and construction of updated generations of ETI Mobile Water Wash Protective Clothing/Respirator Decontamination Units to include introduction and refinement of aqueous borne ozone protective clothing cleaning systems and zero (0) release capability for mobile water wash systems. Supervisor over all mobile operations October 1987 to present. Involved in design and construction of ETI's Ashford Processing Center for off-site processing of radioactively contaminated garments. Facility encompasses an area of 13,000 ft<sup>2</sup> and has a potential processing capability in excess of 60,000 pounds per twenty-four (24) hours. Personally designed all air filtering equipment used for cleaning plant exhaust air (i.e.: dryer exhaust, negative pressure systems). Personally designed and installed all plant waste effluent monitoring systems (i.e.: air, water). Personally wrote all procedures for operation of off-site decontamination facility including but not limited to: radiation protection program; contamination monitoring and control; activity

**PERSONAL INFORMATION WAS REMOVED  
BY NRC. NO COPY OF THIS INFORMATION  
WAS RETAINED BY THE NRC.**

determination for air samples, water samples and smears; posting, monitoring and control of RLA; operation and calibration of Eberline RM-20 for use in Automated Radioactive Laundry Monitor; operation and calibration of Eberline RM-14S for use in Automated Radioactive Laundry Monitor; operation and calibration of Eberline RM-20 for use with GM Probe; operation and calibration of Eberline RM-14S for use with GM Probe; operation and calibration of RM-14SA/Nia waste water effluent monitor; operation and calibration of Eberline AMS-3A alarming air monitor; operation and calibration of the Nucleus Scaler Timer; Radiation Worker Training/Retraining; laundry process control Ashford Service Center. Ultimately responsible for all radiation safety (H.P.) activities within the Ashford Service Center. Also, ultimately responsible for all radioactive material shipments entering and leaving facility. Continually involved in the management of Eastern Technologies, Inc. from its inception to present.

**Dates Worked:** Feb. 1988 - Present

**Florida Power & Light      Vice-President      St. Lucie Power Plant      St. Lucie, FL**

**Job Description:** Site Supervisor for Mobile Water Wash Protective Clothing Decontamination Unit and Mobile Automated Radioactive Laundry Monitor for unit II refueling outage; independent use of radiation detection equipment to ensure dose rates on bags read as marked (e.g.: Ludlum L 7, Eberline R02); responsible for the handling of laundry contaminated with mixed fission products and corrosive products of up to 1 Ci; responsible for the handling of compatible materials.

**Dates Worked:** Oct. 1987 - Jan. 1988

**Vice-President      Ashford, AL**

**Job Description:** Involved in design and construction of Mobile Water Wash Protective Clothing/Respirator Decontamination Unit and Mobile Automated Radioactive Laundry Monitor.

**Dates Worked:** July 1987 - Sept. 1987

**Vice-President      Ashford, AL**

**Job Description:** Over see engineering and construction of Automated

Radioactive Laundry Monitor 001 being designed and built for Alabama Power Company.

**Dates Worked:** June 1987 - July 1987

**Vice-President** Ashford, AL

**Job Description:** Formation of ETI to provide on-site services for nuclear power stations.

INS Site Service Foreman Florida Power & Light St. Lucie, FL  
St. Lucie Power Plant

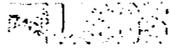
**Job Description:** Decon and certification of respiratory protection devices; operate and maintain decon equipment independent use of radiation detecting equipment to ensure dose rates on bags read as marked (e.g.: Ludlum L 7, Eberline R02); responsible for the handling of compatible materials; responsible for taking and reading smear surveys of the work areas and equipment.

**Dates Worked:** April 1986 - June 1986

**Site Service Foreman** Alabama Power Company Columbia, AL  
Farley Nuclear Plant

**Job Description:** Protective garment decon; decon and certification of respiratory protective devices; operate and maintain decon equipment; source control and handling. Responsible for the handling of compatible materials; responsible for the handling of laundry contaminated with mixed fission products and corrosive products in quantities up to 1 Ci.

**Dates Worked:** Dec. 1985 - Dec. 1986



Water Resources

Data Category:  Geographic Area:



During cold weather, ice effects on stage and discharge determinations at some stream-gaging stations are likely. Data values reported on these pages may be significantly higher or lower than actual streamflow. Adjustment of data for ice effects can only be done after detailed analysis. Users are encouraged to contact this office for more information on specific stream-gaging stations.

## USGS 01540500 Susquehanna River at Danville, PA

### PROVISIONAL DATA SUBJECT TO REVISION

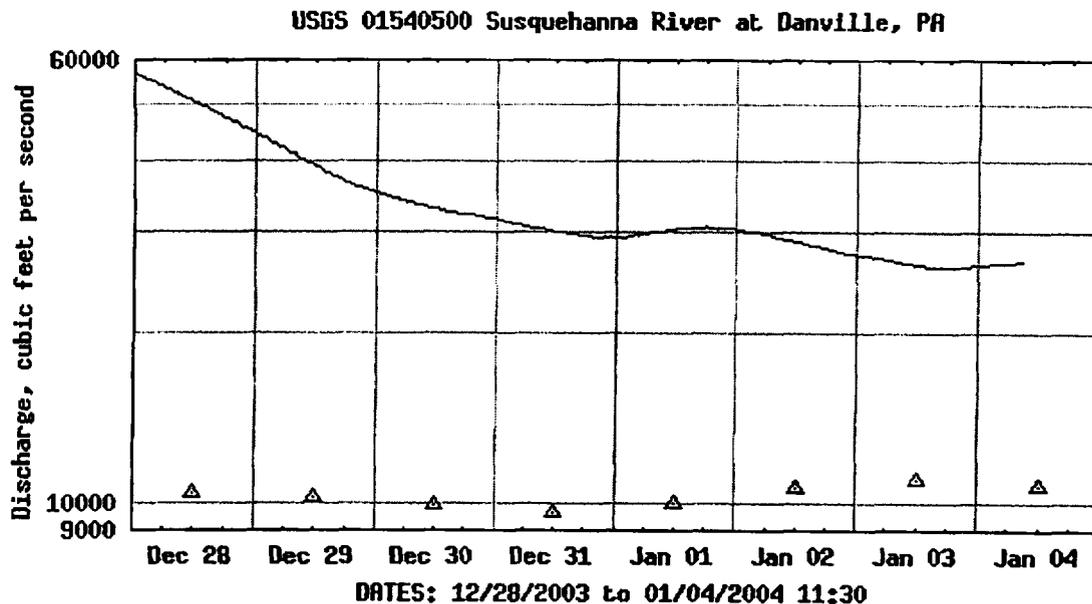
Available data for this site

**STATION.**--01540500 SUSQUEHANNA RIVER AT DANVILLE, PA (National stream-quality accounting network station)  
**LOCATION.**--Lat 40°57'29", long 76°37'10", Montour County, Hydrologic Unit 02050107, on right bank 200 ft upstream from Mill Street bridge on State Highway 54 at Danville and 0.8 mi upstream from Mahoning Creek.  
**DRAINAGE AREA.**--11,220 mi<sup>2</sup>.  
**PERIOD OF RECORD.**--March 1899 to current year. Prior to April 1905 monthly discharge only, published in WSP 1302.  
**GAGE.**--Water-stage recorder. Datum of gage is 431.29 ft above sea level. Prior to June 29, 1939, nonrecording gage at or near Mill Street bridge at same datum. Since Oct. 1, 1971, water-stage recorder for Susquehanna River at Sunbury (station 01553990), used as an auxiliary gage.  
**EXTREMES OUTSIDE PERIOD OF RECORD.**--Flood of Mar. 18, 1865, reached a stage of 28 ft, discharge not determined.  
**FLOOD STAGE.**--NOAA, National Weather Service river forecast station flood stage provided to USGS April 1999 is 20 feet.  
**COOPERATION.**--Funding for the operation of this station is provided by the Pennsylvania Department of Environmental Protection, the U.S. Army Corps of Engineers, and the U.S. Geological Survey.

Available Parameters	Output format	Days	
All 2 parameters available at this site	<input type="text" value="Graph"/>	<input type="text" value="7"/>	<input type="text" value="60 days"/>
00060 Discharge (DD 01)		(1-31)	
00065 Gage height (DD 02)			

**Discharge, cubic feet per second**

Most recent value: 26,800 01-04-2004 08:30



**EXPLANATION**  
 — DISCHARGE  
 ▲ MEDIAN DAILY STREAMFLOW BASED ON 97 YEARS OF RECORD

[Download a presentation-quality graph](#)

Parameter Code 00060; DD 01

**Daily mean flow statistics for 1/4 based on 97 years of record in ft<sup>3</sup>/sec**

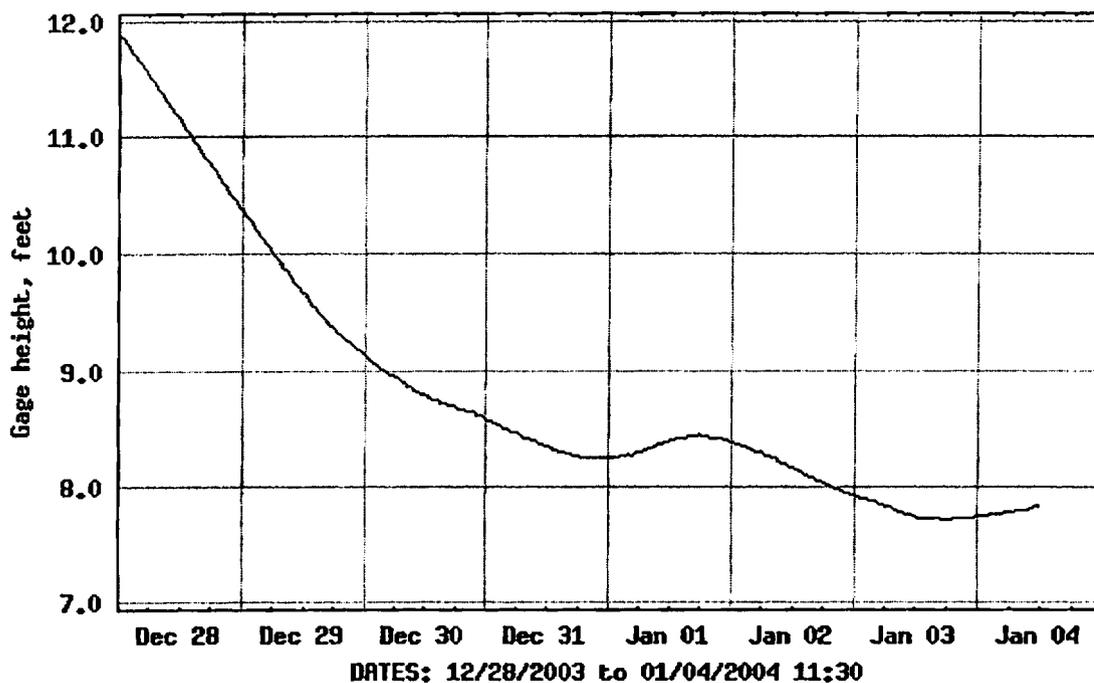
Current Flow	Minimum	Mean	Maximum	80 percent exceedance	50 percent exceedance	20 percent exceedance
26,800	1,500	17,130	106,000	5,372	10,800	28,280

Percent exceedance means that 80, 50, or 20 percent of all daily mean flows for 1/4 have been greater than the value shown.

**Gage height, feet**

Most recent value: 7.82 01-04-2004 11:30

USGS 01540500 Susquehanna River at Danville, PA



[Download a presentation-quality graph](#)

Parameter Code 00065; DD 02

Questions about data [gs-w-pa\\_NWISWeb\\_Data\\_Inquiries@usgs.gov](mailto:gs-w-pa_NWISWeb_Data_Inquiries@usgs.gov)

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Feedback on this website [gs-w-pa\\_NWISWeb\\_Maintainer@usgs.gov](mailto:gs-w-pa_NWISWeb_Maintainer@usgs.gov)

[Explanation of terms](#)

Real-time Data for Pennsylvania  
<http://waterdata.usgs.gov/pa/nwis/uv?>

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USGS Water Resources of Pennsylvania  
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EASTERN TECHNOLOGIES, INC.

DECOMMISSION FUNDING PLAN-PA

COST ESTIMATE

- I. PRECAUTIONS
- II. ESTIMATE OF TOTAL COST FOR DECOMMISSIONING
- III. METHOD FOR UPDATING AND ADJUSTMENTS
- IV. FINANCIAL ASSURANCE

APPROVED BY: Mark Fellows  
Mark Fellows  
Vice President

I. PRECAUTIONS

Berwick Service Center

- A. Floors and walls throughout the facility will be sealed with a coating to help ensure that concrete/block surfaces do not become impregnated with radioactive material.
- B. Where practical all components holding or processing radioactively contaminated liquids will be made from plastic, fiberglass or coated material. The use of plastic and fiberglass will ensure quick dismantling, decontamination and volume reduction, where applicable. The use of coatings will limit the contamination of base material and therefore speed decontamination efforts. For volume reduction and decontamination, plastic and PVC will be cored or shaved to remove contaminated material. Removal of such material to a depth of 1/16 of an inch should totally decontaminate the wetted surface of the item and allow the remainder to be surveyed for release. Coated material will have the coating removed for decontamination purposes and the remainder of the material will be surveyed for release. Any areas found that remain contaminated will have additional material removed to complete the decontamination process.
- C. House keeping techniques for the continuous decontamination of plant surfaces and components will be implemented to keep the facility as free as possible from any build up of contamination.

II. ESTIMATE OF TOTAL COST FOR DECOMMISSIONS

A. Unit Cost of Workers

<u>Position</u>	<u>Basic Salaries (\$/yr)</u>	<u>Overhead Rate %</u>	<u>Worker Cost/yr</u>	<u>Worker Cost/day</u>
Supervisor	\$60,000.00	18.28%	\$70,968.00	\$272.95
Plant Mngr.	\$60,000.00	19.81%	\$71,886.00	\$276.49
Health Physicist	\$70,000.00	18.28%	\$82,796.00	\$318.45
Health Physics Tech.	\$45,000.00	19.81%	\$53,915.00	\$208.00
Laborer	\$18,720.00	32.02%	\$24,714.00	\$95.05
Clerical	\$18,720.00	31.72%	\$24,658.00	\$94.84

Note: Daily rates are based on 245 working days per year.

Decommission Funding Plan-PA

B. Planning And Preparation

Estimated Work Days

<u>Task</u>	<u>Supervisor</u>	<u>Plant Manager</u>	<u>Health Physicist</u>	<u>Health Physicist Tech</u>	<u>Clerical</u>	<u>Total Man Days</u>	<u>Total Cost</u>
Preparation Of Documentation For Regulatory Agencies	1 @ 1		1 @ 3		1 @ 1	5	\$1,323.14
Submittal of Decommissioning Plan to NRC	1 @ 1		1 @ .5		1 @ .5	2	\$479.60
Development Of Work Plans	1 @ 1	1 @ 1	1 @ 1		1 @ .5	3.5	\$915.31
Procuring of Special Equipment	1 @ 1	1 @ .5			1 @ .5	2	\$458.62
Staffing Training	1 @ 1	1 @ 1	1 @ 1	3 @ 1	1 @ 1	7	\$1,586.73
Radiological Assessment, Mapping And Characterization		1 @ .5	1 @ 5	4 @ 5	1 @ 3	24.5	<u>\$5,538.12</u>
<b>Total Cost</b>							<b>\$10,301.52</b>

C. Radioactive Components, Associated Surface Areas And Approximate Weight

<u>Item</u>	<u>Note</u>	<u>Equipment Units</u>	<u>Total Approximate Weight</u>	<u>Total Surface Area (M<sup>2</sup>)</u>
<b>Liquid Effluent Tanks</b>				
First Stage	3	1	1,294	11.89
Second Stage	3	1	522	6.31
Holding Tanks	6	4	8,390	215.57

## Decommission Funding Plan-PA

<b>Effluent Piping – PVC</b>				
8"	5	132'	716	25.48
4"	5	23'	47	2.24
3"	5	137"	199	9.99
2"	5	70'	49	3.39
1.5"	5	255'	132	9.29
<b>Effluent Piping – Stainless</b>				
3"	7	3'	23	NA
2"	7	10'	37	NA
1.5"	7	77'	209	NA
<b>Effluent Hose</b>				
3"	7	21'	26	NA
2"	7	150'	114	NA
1.5	7	50'	31	NA
<b>Effluent Filters</b>				
Shaker Screen	3	1	300	.643
Indexing Filter	3	1	800	.462
Cartridge Filters	3	3	750	1.641
<b>Effluent Pumps</b>	3	2	226	.07
<b>Sorting Equipment</b>	3	6	1,500	37.92
<b>Washing Machines</b>				
450 lb	1,3	5	98,235	144.00
200 lb	1,3	1	8,732	18.91
<b>Dryers</b>				
600 lb	1,3	5	52,273	349.64
150 lb	1,3	1	1,314	7.64
<b>Dryer Exhaust System</b>	3,4	229'	1,145	140.49
<b>Air Conditioning System</b>	3,4	160'	800	118.91
<b>Orex Decontamination System</b>				
Solution Tank	3	2	3,220	532
Surge Tank	6	1	180	21
<b>Piping – SS</b>				
1.5"	3	60'	164	5.58
1.0"	3	80'	168	1.94
<b>Piping – PVC</b>				
1.5"	5	100'	52	9.3
Pumps	3	2	75	.03
<b>Floor Area</b>				
Laundry & Sorting	2	NA	NA	562.07
Wastewater Filtration	2	NA	NA	153.29

Decommission Funding Plan-PA

Shipping & Receiving	2	NA	NA	209.04
Monitoring & Prep.	2	NA	NA	617.81
Offices & Restrooms	2	NA	NA	130.07
Dryer Exhaust System	2	NA	NA	27.88
<b>Wall Area</b>				
Laundry & Sorting	2	NA	NA	650.32
Wastewater Filtration	2	NA	NA	189.52
Shipping & Receiving	2	NA	NA	390.20
Monitoring & Prep.	2	NA	NA	538.48
Offices & Restrooms	2	NA	NA	334.45
Dryer Exhaust System	2	NA	NA	95.13

- Notes:
1. All contact surfaces taken into consideration.
  2. To be decontaminated to unrestricted release limits.
  3. Equipment will be decontaminated and surveyed for fixed contamination. Fixed contamination will be removed where practical. Sections or parts having fixed contamination that cannot be removed through economically sound processes will be dismantled and disposed of as radioactive waste.
  4. To be dismantled; interior linens/coatings will be removed, packaged and disposed of as radioactive waste.
  5. Internally contaminated PVC water lines to be cored to remove contaminated material. Contaminated material to be packaged and disposed of at a low level waste site.
  6. Plastic tanks will be cleaned and subsequently have their internal surface area removed to a depth of approximately 1/16" from the original surface. Material radioactive removed will be disposed of as waste. Radioactive waste should not exceed 10% of the original weight of the equipment. Remainder of the tank will be surveyed for release.
  7. Total components will be disposed of as radioactive waste.

Decommission Funding Plan-PA

D. Task Performance

<u>Task</u>	<u>Supervisor</u>	<u>Estimated Work Days</u>					<u>Total Cost (\$)</u>
		<u>Plant Manager</u>	<u>Health Physicist</u>	<u>HP Tech</u>	<u>Total Laborer</u>	<u>Total Days</u>	
Decon Washers		1	.5	6	26	33.5	4,155.02
Decon Dryers		1	.5	6	26	33.5	4,155.02
Dismantle Decon Dryer Exhaust System		1	.5	6	23	30.5	3,869.87
Dismantle/Decon Effluent Piping & Filtration Equipment		1	.5	6	8	15.5	2,444.12
Dismantle/Decon Effluent Tanks		1	.5	5	8	14.5	2,236.12
Dismantle/Decon Orex VR System		1	.5	8	8	17.5	2,860.12
Dismantle/Decon HP Lab		.5	.5	1	1	3	598.76
Dismantle/Decon Sorting Tables		.5	.5	3	4	8	1,299.91
Dismantle/Decon Air Cond. System		.5	.5	6	10	17	2,494.21
Decon Walls & Floors & Resurvey		1	1	22	22	46	7,258.50
Package Waste		1	2	8	8	19	<u>3,334.25</u>
<b>Total Cost</b>							<b>\$34,705.90</b>

E. Estimate of Weight Volume

<u>Item</u>	<u>Estimated Waste Volume (.lbs)</u>
<b>Effluent Tanks</b>	
Liquid Rad Waste Collection Tank	50
First Stage Filtration Collection Tank	35
Second Stage Filtration Collection Tank	35
Holding Tanks	837
<b>Effluent Piping – PVC</b>	
8"	72
4"	5
3"	20
2"	5
1.5"	13

Decommission Funding Plan-PA

<b>Effluent Piping – Stainless Steel</b>	
3"	23
2"	37
1.5"	209
<b>Effluent Hose</b>	
3"	26
2"	114
1.5"	31
<b>Effluent Filters</b>	
Shaker Screen	50
Indexing Filter	36
Cartridge Filters	47
<b>Effluent Pumps</b>	18
<b>Sorting Tables</b>	90
<b>Washing Machines</b>	
450 lbs.	200
200 lbs.	15
<b>Dryers</b>	
600 lbs.	400
150 lbs.	17
<b>Dryer Exhaust System</b>	300
<b>Air Conditioning System</b>	228
<b>Orex VR System</b>	
Solution Tank	200
Surge Tank	18
Piping – SS	
1.5"	6
1.0"	8
Piping – PVC	
1.5"	5
Pumps	18
<b>Floor Area – All</b>	655
<b>Wall Area – All</b>	<u>1,304</u>
<b>Total Weight</b>	<b>5,099 lbs.</b>

F. Estimate of Disposal Costs For Radioactive Waste

1. Direct Disposal Cost

$$5,099 \text{ lbs.} \times \$3.50/\text{lb.} = \$17,846.50$$

Decommission Funding Plan-PA

Note: ETI's disposal contract with RACE is \$3.50 per pound.

2. Transportation Cost

1,003 miles (Berwick, PA to Memphis, TN) X \$2.00/mile =  
\$2,006.00

Note: RACE is located in Memphis, TN.

3. Total Disposal Cost

Direct Disposal Cost (\$17,846.50) + Transportation Cost  
(\$2,006.00) = \$19,852.50

G. Estimate of Utility Costs

Berwick

12 weeks @ \$350.00/week = \$4,200.00

H. Estimate of Total Decommissioning Costs

1. Planning and Preparation

\$10,301.52

2. Task Performance

\$34,705.90

3. Waste Disposal

\$19,852.50

4. Utility Charges

\$4,200.00

5. Total Decommissioning Cost

\$69,059.92

Decommission Funding Plan-PA

- 6. Contingency Fund  
\$180,940.08
- 7. Total Decommissioning Fund  
\$250,000.00

III. METHOD FOR UPDATING AND ADJUSTMENTS

The Decommission Funding Plan-PA will be updated at each license renewal unless plant or process modifications dictate more frequent updates. All associated costs included in the Decommission Funding Plan-PA will be updated to reflect current associated costs.

IV. FINANCIAL ASSURANCE

Financial assurance for this Decommission Funding Plan-PA will be provided by an Escrow Account with the assets of the account being a certificate of deposit sufficient in size to cover the estimated decommissioning cost.

ESCROW AGREEMENT

This ESCROW AGREEMENT ("Agreement") is entered into this day 6 of June 2003, between:

To be determined.

and

EASTERN TECHNOLOGIES, INC. (ETI)  
215 Second Avenue  
Post Office Box 409  
Ashford, Alabama 36312-0409

upon the following terms and conditions:

- 1. ESTABLISHMENT OF ESCROW ACCOUNT: It is agreed between the parties that ETI has elected to establish an escrow account with Escrow Agent to provide financial assurance for decommissioning of the facility described below, in the amounts shown:

Eastern Technologies, Inc.  
Post Office Box 409  
215 Second Avenue  
Ashford, Alabama 36312-0409  
Amount: \$86,864.25

- 2. DESCRIPTION OF PROPERTY IN ESCROW ACCOUNT: It is hereby acknowledged by the parties that the sum of Two Hundred Fifty Thousand Dollars (\$250,000.00) has been delivered to escrow and will remain in the escrow account created by this Agreement until one of the two conditions stated in Paragraph 3 of this Agreement has been satisfied.

ETI warrants to and agrees with Escrow Agent that, unless otherwise expressly set forth in this Agreement: there is no security interest in the property in the escrow account or any part thereof; no financing statement under the Uniform Commercial Code is on file in any jurisdiction claiming a security interest in or describing (whether specifically or generally) the escrow account or any part thereof; and the Escrow Agent shall have no responsibility at any time to ascertain whether or not any security interest exists or to file any financing statement under the Uniform Commercial Code with respect the escrow account or any part thereof.

- 3. CONDITIONING OF ESCROW AGREEMENT: The property described in paragraph 2 above, will remain in the escrow account created by this Agreement until one of the two following conditions has been satisfied: (1) the

decommissioning activities required by 10 CFR 30 have been completed, the license has been terminated, the facility site is available for unrestricted use for any public or private purpose, and the escrow account has been terminated by joint notice, in writing, from ETI and the United States Nuclear Regulatory Commission (USNRC); or (2) the escrow agent, has been notified by the USNRC, in writing, that ETI has defaulted on the agreed obligation to carry out the decommissioning for the above listed facility.

4. **DISBURSEMENT OF PROPERTY IN ESCROW ACCOUNT:** The Escrow Agent shall make payments from the escrow account upon the presentation of a certificate duly executed by the Secretary of ETI attesting to the occurrence of the events, and in the form set forth in the attached Specimen Certificate, and upon presentation of a certification attesting to the following conditions:

1. That decommissioning is proceeding pursuant to the plan approved by USNRC as certified by that department.
2. That the funds withdrawn will be expended for activities undertaken pursuant to that plan, and;
3. That the USNRC has been given thirty- (30) days prior notice of Licensee's intent to withdraw funds from the escrow account.

Note: Failure to follow all of the above mentioned guidelines will constitute a default on the part of Eastern Technologies, Inc.

No withdrawal from the account can exceed 10% of the outstanding balance of the escrow account or 3,000 dollars; whichever is greater, unless approval of USNRC is provided to Escrow Agent in writing.

Upon Escrow Agent receiving written notification of ETI's default from USNRC, Escrow Agent shall make payments from the escrow account, as the USNRC shall direct, in writing, to provide for the payment of the costs of the required decommissioning activities covered by this Agreement. The Escrow Agent shall reimburse ETI or other persons as specified by the USNRC, in writing. Upon refund, such funds shall no longer constitute part of the escrow account as described in paragraph 2, above.

5. **IRREVOCABILITY:** It is also agreed between the parties that this escrow became irrevocable upon delivery to Escrow Agent and will remain irrevocable and in full force and effect until the occurrence of one of the conditions described in paragraph 3, above.
6. **POWERS OF THE ESCROW AGENT:** The only powers and duties of the Escrow Agent shall be to hold the escrow properly and to invest and dispose of it in accordance with the terms of this Agreement.

7. **ESCROW ACCOUNT MANAGEMENT:** The Escrow Agent shall invest and reinvest the principal and income of the escrow account and keep the escrow account, invested as a single fund, without distinction between principal and income, in accordance with general investment policies and guidelines from time to time, subject, however, to the provisions of the escrow account; the Escrow Agent shall discharge its duties with respect to the escrow account solely in the interest of USNRC and with the care, skill, prudence, and diligence, under the circumstances then prevailing, that persons of prudence, acting in like capacity and familiar with such matters, would use in the conduct of an enterprise of like character and with like aims; except that:

- a. Securities or other obligations of ETI, or any other owner or operator of the licensed facility, or any of their affiliates as defined in the Investment Company Act of 1940, as amended (15 U. S.C. 80A-2 (a)), shall not be acquired or held, unless they are securities or other obligation of the Federal Government;
- b. The Escrow Agent is authorized to invest the escrow account in an interest bearing account deposit to the extent insured by an agency of the Federal Government; and

**Express Power of the Escrow Agent:** Without in any way limiting the powers and discretion conferred upon the Escrow Agent by other provisions of the Agreement or by law, the Escrow Agent is expressly authorized and empowered:

- a. To register any securities held in the escrow account in its own name and to hold any security in bearer form or in book entry, or to deposit or arrange for the deposit of any securities issued by the U.S. Government, or any agency or instrumentality thereof, with a Federal Reserve Bank, but the books and records of the Escrow Agent shall at all time show that all such securities are part of the escrow account;
- b. To deposit any cash in the escrow account in interest bearing accounts or savings certificated to the extent insured by an agency of the Federal Government;
- c. To pay taxes, from the account, of any kind that may be assessed or levied against the escrow account and all brokerage commissions incurred by the escrow account.

**ANNUAL VALUATION:** After delivery has been made into this escrow account, furnish to ETI, and to the USNRC a statement confirming the value of the escrow account. Any securities in the account shall be valued at market value as of no more than sixty- (60) days before the anniversary date of the establishment of the escrow account. The failure of ETI to object in writing to the

Escrow Agent within ninety (90) days after the statement has been furnished to ETI shall constitute a conclusively binding assent by ETI, barring ETI from asserting any claim or liability against the Escrow Agent with respect to the matters disclosed in the statement.

8. SUCCESSOR ESCROW AGENT: Upon ninety (90) days prior notice to the USNRC and ETI, Eastern Technologies, Incorporated, the Escrow Agent may resign; upon ninety (90) days notice to the USNRC and the Escrow Agent, ETI, may replace the Escrow Agent; provided that such resignation or replacement is not effective until the Escrow Agent has appointed a successor escrow agent and this successor accepts the appointment. The successor escrow agent shall have the same powers and duties as those conferred upon the escrow agent under this Agreement. Upon the successor's acceptance of the appointment, the Escrow Agent shall assign, transfer and pay over to the successor the funds and properties then constituting the escrow account. If for any reason ETI cannot or does not act in the event of the resignation of the Escrow Agent, the Escrow Agent may apply to a court of competent jurisdiction for the appointment of a successor, or for instruction. The successor escrow agent shall specify a date on which it assumes administration of the escrow account in writing sent to ETI, the USNRC, and the current escrow agent by certified mail then (10) days before a change becomes effective. Any expenses incurred by the Escrow Agent as a result of any of the acts contemplated by this paragraph shall be paid as provided in Paragraph 10 of this Agreement.
9. INSTRUCTIONS TO THE ESCROW AGENT: All orders, requests, and instructions from the Licensee to the Escrow Agent shall be in writing, signed by such persons as are signatories to this Agreement, or such other designees as ETI or USNRC may designate in writing. All orders, requests, and instructions from the USNRC shall be in writing, signed by the designees of the Division. The Escrow Agent shall be fully protected in acting in accordance with such orders, requests, and instructions. The Escrow Agent shall have the right to assume, in the absence of written notice to the contrary, that no event constituting a change or a termination of the authority of any person to act on behalf of ETI or USNRC under this Agreement has occurred. The Escrow Agent shall have no duty to act in the absence of such orders, requests, and instructions from ETI and/or USNRC, except as provided in this Agreement.
10. COMPENSATION AND EXPENSES OF THE ESCROW AGENT: The fee of the Escrow Agent for its services in establishing the escrow account shall be \$\_\_\_\_\_, payable at the time of the execution of this Agreement, to be borne by ETI.

Expenses of the Escrow Agent for the administration of the escrow account, the compensation of the Escrow Agent for services subsequent to the establishing of the escrow account to the extent not paid directly by ETI, and all other proper charges and disbursements shall be paid from the escrow account.

11. **AMENDMENT TO THIS AGREEMENT:** This Agreement may be amended by an instrument in writing executed by ETI and the Escrow Agent provided that ETI has given thirty- (30) days prior notice to the USNRC.
12. **TERMINATION:** This Agreement can be terminated by written notice of termination to the Escrow Agent signed by ETI, and the USNRC, or by the USNRC alone, if ETI has ceased to exist.
13. **INTERPRETATION:** This Escrow Agreement constitutes the entire agreement between ETI and the Escrow Agent. The Escrow Agent shall not be bound by any other agreement or contract entered into by ETI and the only document that may be referenced in case of ambiguity in this Escrow Agreement is the licensing agreement between ETI and the USNRC, or its successor.
14. **ACCEPTANCE OF APPOINTMENT BY ESCROW AGENT:** Escrow Agent does hereby acknowledge its appointment by ETI, to serve as escrow agent for the escrow account created under this Agreement and agrees to carry out its obligations and duties as stated in this Escrow Agreement.
15. **SEVERABILITY:** If any part of this Agreement is invalid, it shall not affect the remaining provisions that will remain valid and enforceable.

This Agreement shall not become effective (and the Escrow Agent shall have no responsibility hereunder except to return the escrow property to ETI) until the Escrow Agent shall have received the following and shall have advised ETI in writing that the same are in form and substance satisfactory to the Escrow Agent:

Certified resolution of its Board of Directors authorizing the making and performance of this Agreement.

Certificate as to the names and specimen signature of its officers or representatives authorized to sign this Agreement and notices, instructions, and other communications hereunder.

To Be Determined

BY: \_\_\_\_\_

ITS: \_\_\_\_\_

EASTERN TECHNOLOGIES, INC.

BY: \_\_\_\_\_  
Mark Fellows

ITS: Vice President

To Be Determined

Attention: Escrow Division

Gentlemen:

In accordance with the terms of the Agreement with you dated \_\_\_\_\_, I, Ann McWaters, Secretary of ETI, hereby certify that the following events have occurred:

1. Eastern Technologies, Inc. is required to commence the decommissioning of its facilities located at 215 Second Avenue and Old Highway 84, "The Ashford Service Center" (herein after called the decommissioning).
2. Plans and procedures for the commencement and conduct of the decommissioning have been approved by the State of Alabama, Department of Public Health, Division of Radiation Control, or its successor, on \_\_\_\_\_ (copy of approval attached).
3. The Board of Directors of ETI has adopted the attached resolution authorizing the commencing of the decommissioning.

\_\_\_\_\_  
Secretary of ETI

\_\_\_\_\_  
Date

I, Ann McWaters, do hereby certify that I am Secretary of Eastern Technologies, Inc., an Alabama corporation, and that the resolution listed below was duly adopted at a meeting of this Corporation's Board of Directors on \_\_\_\_\_.

IN WITNESS WHEREOF, I have hereunto signed by name and affixed the seal of this Corporation this \_\_\_\_ day of \_\_\_\_\_.

\_\_\_\_\_  
Secretary of ETI

**RESOLVED**, that this Board of Directors hereby authorized the President, or such other employee of the Company as he may designate to enter into an escrow agreement with (To be determined) in accordance with the terms and conditions described to this Board of Directors at this meeting and with such terms and conditions as the President shall approve with and upon the advice of Counsel.

**EASTERN TECHNOLOGIES, INC.**  
**RADIATION PROTECTION PROGRAM**

**APPROVED BY:**   
**MARK FELLOWS**  
**VICE PRESIDENT**

Radiation Protection Program-PA

I. INTRODUCTION

A. PURPOSE

The purpose of this Radiation Protection Program-PA manual is to describe Eastern Technologies, Inc.'s method of compliance with applicable regulations, licenses, industry standards and company policy.

ETI's Radiation Protection Program-PA is implemented in detail by and through this manual and other specific procedures.

B. REFERNECES

1. 10 CFR 20, Standards for Protection Against Radiation.
2. 10 CFR 19, Notices, Instructions, and Reports to Workers; Inspection.
3. Regulatory Guide 8.8, Information Relevant to Ensuring that Occupational Exposures at Nuclear Power Stations Will Be as Low as is Reasonably Achievable.
4. Regulatory Guide 8.10, Operating Philosophy for Maintaining Occupational Radiation Exposures As Low as is Reasonably Achievable.
5. NUREG-0041, Manual of Respiratory Protection Against Airborne Radioactive Materials.
6. Regulatory Guide 8.13, Prenatal Exposure.
7. Regulatory Guide 8.15, Acceptable Programs for Respiratory Protection.

C. RESPONSIBILITES

The success of the Radiation Protection Program-PA depends largely on the training, self-discipline and cooperation of each individual. Each individual must commit himself to protection policies by obeying applicable provisions of NRC regulations, procedures and practices, and recognizing and reporting any condition, which may lead to unnecessary exposure to radiation or radioactive material or cause a violation of regulations and/or licenses.

Radiation Protection Program-PA

II. RADIATION PROTECTION STANDARDS

A. GENERAL

1. Scope

This section prescribes the maximum permissible exposure to external and internal radiation as set forth in reference 1 and company limits. The exposure limits and regulations prescribed in this manual shall be applicable to all persons employed by Eastern Technologies, Inc.

2. Responsibilities

a. Individuals

1. Take reasonable precaution to avoid unnecessary exposure and minimize those exposures that are considered necessary.
2. Report to Supervision, as soon as possible, known or suspected high exposures due to external radiation or internal contamination.
3. Report promptly to Supervision all injuries that involve radioactive contamination.
4. Report to supervisor any sickness or physical condition which might alter ones capability for work in a radiation area or RCA.
5. Report to ETI management any new or unusual situation, which could lead to unnecessary exposure.
6. Understand their 'rights' as defined in 10 CFR 19 "Notices, Instruction, and Reports to Workers; Inspections" and/or other applicable sections of 10 CFR.
7. Know and follow the requirements of Radiation Work Permits.

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8. Report to Supervision any known or anticipated radiation exposure including medical exposure (external or internal) prior to each days work.

b. Supervisor Personnel

1. Ensure that employees are informed of radiation hazards in their work area and frequently check with employees to ensure that radiation protection measures are being utilized.
2. Take all reasonable steps in planning each job to avoid unnecessary exposure of employees.
3. Limit the accumulation of high individual exposures by distributing workloads and assigned duties.
4. Be alert for new or unusual situations, which might lead to unnecessary exposure.

c. Management

1. Establish and apply radiation protection standards and practices for maintaining occupational radiation exposures A.L.A.R.A.
2. Inform the Vice President of Eastern Technologies, Inc. of the current radiation exposure status of each employee via periodic reports.
3. Collect data and prepare reports on radiation incidents such as high exposures, inadvertent releases and spills.

B. EXPOSURE LIMITS FOR PERSONNEL

1. Definitions

a. Intake

Amount of radioactive material that the individual is exposed to via airborne activity.

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- b. Uptake  
Amount of radioactive material that actually enters the body's transfer compartment (e.g.: blood).
- c. Deep Dose Equivalent (DDE)  
Applies to external whole body exposure. It is the dose equivalent at a tissue depth of 1 cm. (1,000 mg/cm<sup>2</sup>)
- d. Shallow Dose Equivalent (SDE)  
Applies to the external exposure to the skin or any extremity and is taken as the dose equivalent at a tissue depth of 0.007 centimeter (7 mg/cm<sup>2</sup>) averaged over an area of one square centimeter.
- e. Lens Dose Equivalent (LDE)  
The external exposure to the lens of the eye that is taken as the dose equivalent at a tissue depth of 0.3 centimeters (300 mg/cm<sup>2</sup>)
- f. Committed Dose Equivalent (CDE)  
The dose equivalent, to organs or tissues of reference (Gonads, Breast, Red Bone Marrow, Lung Thyroid, Bone Surfaces, others), that will be received from an intake of radioactive material by an individual during the 50-year period following the intake.
- g. Committed Effective Dose Equivalent (CEDE)  
The sum of the products of the weighting factors applicable to each of the body organs that are irradiated and the committed dose equivalent to these organs or tissues.
- h. Total Organ Dose Equivalent (TODE)  
The sum of the deep dose equivalent (external) and the committed dose equivalent (internal) to the maximally exposed organ other than the eye.

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i. Total Effective Dose Equivalent (TEDE)

The sum of the deep dose equivalent (for external exposures) and the committed effective dose equivalent (for internal exposures).

2. Exposure Limits

a. Annual Exposure

TEDE	5 rem/yr
TODE	50 rem/yr
Lens of the Eye	15 rem/yr
Skin/Extremities	50 rem/yr
Embryo/Fetus	0.5 rem/yr
Public	0.1 rem/yr

b. Planned Special Exposure

Subject to 10 CFR 20.1206 no planned special exposure shall be authorized that would cause an individual to receive a dose from all planned special exposures and all doses in excess of the limit to exceed:

1. The numerical values of any of the dose limits in 10 CFR 20.1201.
2. Five times the annual dose limits in 10 CFR 20.1201 during the individuals' lifetime.

c. Emergency Exposure

During certain emergency situations a one time exposure in excess of annual limits is allowed. The situations and exposure limits are as follows:

<u>Situation</u>	<u>Exposure Limit</u>
Save Equipment	10 rem
Save a Life	75 rem

Note: Any exposure in excess of allowable dose must be approved by the President, Vice President or RSO.

Radiation Protection Program-PA

3. Internal Exposure

- a. The staff will, as a precautionary procedure, use process or other engineering controls, to the extent practicable, to limit concentrations of radioactive materials in air below the limits defined in 10 CFR 20 Appendix B, Table II, Column 1. When it is impracticable to apply process or other engineering controls to limit concentrations of radioactive materials in air to less than 30% of the limits, other precautionary measures, such as increased surveillance, reduction in working times, or use of respiratory protective equipment will be considered to minimize the intake of radioactive materials by any individual.
- b. No individual under 18 years of age shall be exposed to airborne radioactive materials in an average concentration in excess of 10% of the limits specified in 10 CFR 20 Appendix B, Table II, Column 1.

C. ACCUMULATION OF RADIATION EXPOSURE

1. Medical Exposure

Significant exposure to ionizing radiation for medical reasons should be reported. Therefore, each employee is required to notify Supervision of therapeutic radiation treatment or diagnostic radiation (excluding annual chest x-rays and routine dental x-rays). Supervision will determine if the medical exposure will affect the status of any individual.

2. Radiation Exposure at Various Locations

An individual working for ETI, who visits other nuclear facilities where he may be exposed to radiation, shall notify Supervision prior to departure and as soon as possible upon return. An up to date estimate of the exposure received at the facility must be given to ETI supervision before resuming work at ETI facility.

3. Other Non-Employment Related Exposure

An individual shall not cause himself to be exposed off the job site

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to ionizing radiation for other than medical reasons. When not on the job, exposure (including accidental exposure) received off the job shall be reported to Supervision as soon as is practical or upon return to work whichever is earliest.

D. DOSIMETRY RECORDS

Personnel who have a signed, current statement of occupational dose may receive up to 5 REM for the current year; this includes any occupational dose for the current year prior to working for ETI. Dosimetry will be issued to an individual after he has provided a signed statement of his occupational dose for the current year.

III. PERSONNEL MONITORING

A. GENERAL INFORMATION

1. Scope

This section describes required personal monitoring devices (PMD's), urinalysis sampling and whole body counts.

2. Responsibility

- a. It is the responsibility of each radiation worker to wear personal monitoring devices (PMD's) in the prescribed manner and to assure their safekeeping. The loss, damage or contamination of any PMD requires the immediate notification of Supervision.
- b. ETI Supervision will administer the personal monitoring program consistent with the requirements of 10 CFR 20.

B. DOSIMETRY

1. Issuance

a. Thermo Luminescent Dosimeters (TLD's)

Individuals requiring long term and/or continuous access to the radiation-controlled area (RCA) shall be monitored for radiation exposure via thermo luminescent dosimeters

## Radiation Protection Program-PA

(TLD's). Prior to issuance and at termination of permanent TLD, urinalysis, gross activity analysis, or a whole body count must be performed on the individual in question, unless otherwise authorized by ETI supervision.

### Notes:

1. Documented whole body counts from other facilities may be utilized in lieu of this requirement.
2. Visitors are exempt from bioassay testing requirements unless otherwise required by ETI supervision.
3. Issuance of TLD's to visitors is not required unless otherwise specified by ETI supervision.

### b. Self Reading Dosimeters (SRD's)

Individuals requiring access to the RCA must at a minimum be issued a Self Reading Dosimeter in addition to any other monitoring device required.

Note: The dose limit for visitors utilizing an SRD for entry is  $\leq 30$  mr for the entire visit. Additionally no High Radiation and/or Airborne Activity Areas may be entered.

### c. Special Purpose Dosimeters

Special purpose dosimeters (e.g.: extremity badges, multibadge packs, etc.) will be issued as required by associated radiological conditions and ETI supervision.

## 2. Processing

### a. Thermo Luminescent Dosimeters

Permanent Issue: Permanently issued TLD's will be exchanged/processed quarterly.

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Temporary Issue: Temporarily issued TLD's will be processed as needed to verify exposure.

b. Self Reading Dosimeters

Self-reading dosimeters will be processed (read) for documentation purposes, upon each exit of the RCA or upon the individuals transfer to another RWP, whichever occurs first.

c. Special Purpose Dosimeters

Special purpose dosimeters will be processed as needed to verify exposure.

3. PMD Placement

PMD's, except extremity dosimeters, (i.e. finger rings, etc.), shall be worn on the front of the body at or above the waist and below the shoulders except as designated by the HP supervisor or the Radiation Safety Officer for specific instances.

The PMD should be worn in a plainly visible manner unless there is a significant possibility of loss or contamination. For harsh working conditions PMD's may be worn inside the coveralls or inside any suitable protective covering as determined appropriate by the HP supervisor or the Radiation Safety Officer. In such cases, utilization of a skin dose correction factor may be required.

C. BIOASSAY

1. Whole Body Gross Activity Analysis

Whole Body Gross Activity Analysis will be the primary method for establishing concentrations of internally deposited radionuclides. Analysis is required prior to issuance, annually, and upon termination of permanent dosimetry (TLD), unless otherwise authorized by the Radiation Safety Officer. After initial analysis subsequent testing will be performed annually or radiation workers with permanently issued dosimetry. Special case testing may be required by supervision when deemed appropriate.

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Notes:

1. Visitors are exempt form bioassay testing.
2. Urinalysis may be utilized in lieu of whole body gross activity analysis.
3. Documented whole body counts performed by ETI or other facilities may be utilized in lieu of whole body gross activity analysis or urinalysis.

2. Urinalysis

Urinalysis testing, via gamma spectroscopy, will be the secondary method of establishing concentrations of internally deposited radionuclides. Sample collection is required prior to issuance and upon termination of permanent dosimetry (TLD), unless otherwise authorized by the Radiation Safety Officer. After initial urinalysis, subsequent testing will be performed annually on radiation workers with permanently issued dosimetry. Special case testing may be required by supervision when deemed appropriate.

Notes:

1. Visitors are exempt form urinalysis testing.
2. Documented whole body gross activity analysis may be utilized in lieu of urinalysis testing.

3. Whole Body Counting

Whole body counting will be the follow up method of establishing concentrations of internally deposited radionuclides. Whole body counts will be preformed, as required; to verify and quantify findings of internally deposited radionuclides discovered through whole body gross activity analysis or urinalysis. Whole body counts will also be performed as per RSO or management requirements.

Notes:

Radiation Protection Program-PA

1. Whole body counts may be used in lieu of whole body gross activity analysis or urinalysis testing.
2. Documented whole body counts performed by ETI or other nuclear facilities may be utilized to fulfill whole body counting requirements.

4. Other Analysis

Analysis of body excreta (e.g. fecal analysis) or tissue (biopsy) may be performed as deemed necessary by the Radiation Safety Officer or medical consultant.

D. MEDICAL EXAMINATIONS

1. Required

Individuals whose job functions will require them to use respiratory protection equipment require an initial and annual lung function test.

2. Optional

The following medical examinations may be required by the RSO, Supervisor or medical consultants.

- a. Complete or partial physical for persons involved in incidents where regulatory limits may have been exceeded.
- b. Special testing such as blood count may be required for individuals whose exposure exceeds regulatory limits.

IV. RADIATION EXPOSURE CONTROL

A. GENERAL INFORMATION

1. Scope

This section covers procedures, practices and measures, which apply to the Radiation Controlled Area (RCA).

2. Responsibilities

Radiation Protection Program-PA

- a. It is each individual radiation worker's responsibility to obey all Radiation Work Permits and to report to his respective work supervisor any circumstances where there is doubt as to the radiological safety of an operation.
- b. It is the work supervisor's responsibility to assign personnel and plant work in such a manner that personnel exposure is kept ALARA.
- c. It is the Radiation Safety Officer's and/or HP supervisor's responsibility to designate areas according to radiological hazards present and prescribe precautionary measures to be taken when working in these areas.

3. Special Instructions

- a. No eating, drinking, smoking or chewing is permitted inside the RCA unless the Radiation Safety Officer allows such behavior on a case-by-case basis.
- b. There shall be no unprotected wounds present on the body. Serious wounds shall be sealed with a suitable bandage prior to entry. HP supervision shall determine on a case-by-case basis what work restrictions, if any, shall apply to individuals having wounds. Depending upon wound severity, work restrictions may include exclusion from the RCA.

B. RCA POSTING CLASSIFICATIONS

Each area within the Radiation Controlled Area shall be surveyed and conspicuously posted with appropriate caution signs as required by the following criteria:

1. Radiation Area

An area, accessible to individuals, in which radiation levels could result in an individual receiving a dose equivalent in excess of 0.005 rem (5 millirem) (0.05 msv) in one hour at 30 centimeters from the radiation source or from the surface that the radiation penetrates.

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2. High Radiation Area

An area, accessible to individuals, in which radiation levels could result in an individual receiving a dose equivalent in excess of 0.1 rem (100 millirem) (1 msv) in one hour at 30 centimeters from the radiation source or from any surface that the radiation penetrates.

3. Airborne Radioactivity Area

A room, enclosure or area in which airborne radioactive materials, composed wholly or partly of licensed material, exist in concentrations:

- a. In excess of the derived air concentrations (DACs) specified in Appendix B, to 10 CFR 20.1001-20.2401 or,
- b. To such a degree that an individual present in the area without respiratory protective equipment could exceed, during the hours the individual is present in a week, an intake of 0.6 percent of the annual limit of intake (ALI) or 12 DAC-hours.

4. Radioactive Materials Area

Any area or room which there is used or stored an amount of licensed or registered radioactive material exceeding 10 times the quantity of such material specified in Appendix C of 10 CFR 20.

5. Contaminated Area

Any area or room, which contains significant removable surface radioactive contamination. (e.g.:  $> 1,000$  dpm/100 cm<sup>2</sup> Beta/Gamma or  $> 150$  dpm/100 cm<sup>2</sup> alpha).

6. Radiological Restricted Area

Any area posted for the purpose of controlling or restricting access to that area for radiation protection purposes. These areas will normally be areas of inaccessibility (e.g.: ventilation filter housings, etc.) and will not require a survey except during special entry.

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C. RADIATION WORK PERMIT

1. General Information

The Radiation Work Permit (RWP) is the primary administrative control for insuring that surveys are performed and that adequate safeguards have been established to govern work in areas where significant radiation hazards may exist. Any entry into an RCA must be governed by at least one RWP. Each person entering the RCA shall assure himself that he knows the RWP requirements for the job. Persons working intermittently in a particular area or on a particular job will ensure that RWP requirements are known and have not changed prior to re-entry. All personnel shall frisk themselves at the nearest frisking station after crossing a step off pad. Personnel working under the authority of an RWP shall not deviate from the requirements of the RWP unless from the requirements of the RWP unless specifically authorized by ETI supervision.

2. RWP Types and Related Requirements

a. Special Radiation Work Permit (SRWP)

An SRWP is a RWP issued for a specific task or related series of tasks. A SRWP is require for:

1. Entry into areas posted SPECIAL RADIATION WORK PERMIT REQUIRED.
2. Job assignments where whole body exposure to any individual is likely to exceed one hundred (100) mrem/day.
3. Job assignments (i.e.: grinding, cutting, etc.) involving activities that have the potential for significantly increasing radiation or contamination
4. Entry into Posted High Radiation Areas.

Note: Special RWP's are initiated by the work supervisor. The HP Supervisor

Radiation Protection Program-PA

or RSO then completes the appropriate portions and then approves the work. The Special RWP is considered terminated when covered tasks are completed or cancelled or the radiological conditions change unexpectedly.

b. Routine Radiation Work Permit (RWP)

Routine RWP's are for those areas in which radiological hazards are stable and/or predictable and routine entries are necessary for operation of the facility. A routine RWP is required for:

1. Entry into any RCA.
2. Job assignments involving activities within any area of the RCA.

Note: In special cases the presence of supervisory personnel may be substituted for an RWP with the approval of HP Supervisor or RSO.

D. RESPIRATORY PROTECTION

1. General Information

The primary objective of the respiratory protection program is to minimize or eliminate the inhalation of radioactive material. This will be accomplished through the application of engineering controls such as contaminant and ventilation equipment in addition to pre-planning of work. However, if it is necessary that some work function be performed in confined or localized areas where the levels of airborne radioactive material warrant protection and other controls are not feasible, respiratory protection devices may be used to provide necessary protection as per 10 CFR 20, so long as the use of respiratory protection is ALARA.

Note: For the purpose of Radiological Protection, nuisance dust masks are not considered to be respiratory protection devices.

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2. Responsibility

ETI Supervision is responsible for administering the respiratory protection program inside RCA's. This includes issue, cleaning, decontamination, inspection, maintenance, sanitizing, repairs, and storage of respiratory protection equipment. Additional responsibilities include required training of personnel and performance of pulmonary function tests as required by procedure.

3. General Guidelines

Respiratory protection devices will be provided to protect personnel from airborne radioactivity in accordance with 10 CFR 20. Respirators may be utilized provided they do not increase exposure (e.g.: respirator use must be ALARA) cause significant discomfort, create a safety hazard or unduly restrict an individual in the performance of his work. These requirements will be evaluated and modified as the radiological work conditions dictate. Personnel who are required to wear respirators must be clean-shaven in the area where the mask seals with the face. Facial conditions must remain the same as when the individual was fitted and qualified and the individual must have been certified able to wear a respirator via a lung function test.

4. Notification of Required Use

The requirement for respiratory protection devices will be specified on the applicable RWP.

5. Post Use Analysis

To check the effectiveness of respiratory protection devices used for protection against airborne radioactivity, nasal smears shall be taken and analyzed after each respirator use.

E. RADIATION INCIDENT REPORT

Violations of ETI Radiation Control and Protection Procedures, potential or actual over-exposures or actions which involve potential or actual unnecessary radiation exposure are documented by a Radiation Incident Report (RIR).

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The RIR will be used as a means of documenting identified problems and the resulting corrective action(s).

V. RADIOACTIVE MATERIAL CONTROL WITHIN THE RCA

A. TOOLS

Any tools or material brought into the radiation controlled area (RCA) shall be considered contaminated and shall not be removed from the RCA unless surveyed and released by appropriate personnel. Tools not meeting fixed activity release criteria or tools that contain smearable contamination shall be held for decontamination and/or restricted for use only within the RCA.

If it becomes necessary to utilize un-contaminated tools within a contaminated area the tools should be protected, if possible or practical, to reduce the change of contamination the tool. After the use, the tools shall be wiped down and/or cleaned so as to remove any contamination deposited on the tool during use. If decontamination efforts are not successful and fixed contamination remains above levels allowed by release criteria, then the tool shall be restricted for use only within the RCA. Restricted use tools should be stored in areas designated by supervision. As a precaution, tools having a fixed radiation level  $\geq 2.5$  mr/hr shall be conspicuously marked, prior to initial placement into restricted use inventory, to allow for easy identification.

If, due to special circumstances, it becomes necessary to utilize tools containing smearable contamination in an uncontaminated area of the RCA these tools shall be contained within a bag or other protective covering, except when in use. Additionally, permission for such activity must be granted by appropriate supervision prior to movement of any contaminated tool or material into an un-contaminated area. Immediately upon completion of the task, the tools will be returned to the protective enclosure and transported to the appropriate storage area. The work area must also be surveyed for contamination and if appropriate, decontaminated before the area is released for general entry.

B. COMPONENTS

Components are considered, valves, fittings, parts, special tools, equipment, etc., that are contaminated. It does not include waste, mops, or other related items.

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Components removed from a contaminated system or area shall be surveyed for radiation and contamination levels and labeled appropriately. Decontamination of the item will be undertaken if appropriate, possible and/or practical. HP supervision will ensure that the item is properly packaged, if required, and tagged. HP will also ensure that the tag contains the required information. After processing and tagging, the item shall be stored as per supervisory directives.

C. PROTECTIVE CLOTHING

For work inside the permanent RCA, protective clothing requirements will be listed on the governing RWP. Protective clothing will be stored in an area designated for that purpose. Protective clothing will not be removed from the permanent RCA without the approval of HP, RSO or other appropriate supervision. Should protective clothing be required for work inside of a temporary RCA it shall remain within the confines of that RCA until returned to the permanent RCA. Protective clothing may not be worn outside an RCA unless permission is granted on a case-by-case basis by HP, RSO or other appropriate supervision.

VI. RCA EMERGENCIES

A. INJURIES

1. Minor Injury

In cases of minor injury, personnel will leave the work area immediately and have appropriate supervisory personnel check the wound for contamination. If contamination is found, decontamination will be attempted by appropriate personnel as first aid is administered. Bioassay samples may be required to check for possible uptake of radioactive contamination at the discretion of ETI supervision.

2. Major Illness or Injury

In case of major illness or injury the following guideline should be followed:

- a. The individual who discovers the affected person will render any first-aid for which he is qualified and notify Supervision.

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- b. First-aid personnel will determine the extent of the injury or illness and perform emergency first-aid.
- c. Protective clothing will be removed and if required, decontamination will be performed, if possible, without aggravating the patient's condition. LIFE SAVING MEDICAL ATTENTION HAS TOP PRIORITY.
- d. The patient will be transported to the hospital as per received instructions if appropriate.

**B. FIRE**

The senior person in charge will supervise fire-fighting efforts and determine required protective clothing and respiratory equipment.

**C. UNSUSPECTED HIGH RADIATION LEVELS**

If unusual or unsuspected high radiation levels are detected in work areas, occupied by personnel, the following procedure should be followed:

1. Clear the area.
2. Notify ETI supervisor immediately.
3. Check dosimeter readings of all personnel involved.
4. Survey the area and evaluate the hazard.
5. Place barricades and radiation caution signs as required.
6. Determine cause of high radiation.
7. Determine mitigating actions required
8. Implement mitigating actions.
9. Repost area with regard to current conditions.

Note: Action #1 and #2 may be performed by any individual involved in the incident. Other actions should be

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performed and/or directed by appropriate supervisory personnel.

D. RADIOACTIVE MATEIRAL SPILLS

1. Minor Spill

- a. Stop or confine the spill immediately, if possible.
- b. Clear personnel and restrict further entry of personnel not involved I containing and/or cleaning up the spill.
- c. If appropriate, restrict entry by roping off and posting the area.
- d. Notify Plant Manager, HP or other appropriate supervision.
- e. HP technicians or other appropriate supervision will survey and monitor all personnel involved. If appropriate, decontamination of personnel will be initiated.
- f. HP technicians or other appropriate supervision will survey the area of the spill. If appropriate, decontamination of affected areas will be initiated.
- g. Normal entry and work within the area may be resumed when the area is returned to normal condition.

2. Major Spill

- a. Stop and confine the spill immediately, if possible, to prevent additional release of radioactive material.
- b. Notify ETI supervision immediately.
- c. Clear personnel and restrict further entry of personnel not involved in containing and/or cleaning up the spill.
- d. Restrict entry by roping off and posting the area.

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- e. HP technicians or other appropriate supervision will survey and monitor all personnel involved. If appropriate, decontamination of personnel will be initiated.
- f. Normal entry into and work within the area may be resumed when the area is returned to normal condition.

VII. CORPORATE ALARA PROGRAM

A. PHILOSOPHY AND COMMITMENT

The intent of this chapter is to define a corporate management philosophy for maintaining occupational exposure "As Low As Reasonable Achievable" (ALARA).

It is ETI's intention to ensure that all activities be conducted in a manner such that occupational exposure will be kept ALARA.

If it can be shown in a reasonable fashion that the radiation exposure is "truly unavoidable" or the "cost" of reducing radiation exposure is unreasonable in comparison with the commensurate benefits, then it is by definition ALARA. Maintaining occupational radiation exposure ALARA is a management commitment and designated individuals within the company will be charged with the responsibility of implementing it. To be achieved successfully, ALARA must be practiced by employees, contractors and visitors. To fulfill the commitment, a basic management ALARA program will be defined and implemented. This program will recognize that future design; modifications and operating experience are interrelated. Equivalent designs, when applicable, will be reviewed against radiation exposure information to determine potential impact.

B. OBJECTIVES

The objectives of corporate management's program of keeping occupational doses ALARA are:

1. To maintain the annual dose (REM) to individual personnel ALARA.
2. To maintain the annual integrated dose (man-rem) to all personnel at the plant ALARA.

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C. GUIDELINES

When evaluating proposed ALARA radiation exposure reduction measures, a cost of \$6,000.00 for each 1 man-rem/year of occupational radiation exposure reduction will be considered cost effective. A higher cost per man-rem/year may be justified in specific cases.

D. RESPONSIBILITY

1. Management

The ALARA program will be implemented under the direction of the Vice President or his designee. Responsibilities include program development, implementation and management.

2. Supervision

Responsibilities include:

- a. Ensuring all personnel in their group comply with the ALARA Program guidelines.
- b. Ensuring suitable advanced planning, management notification and special training and performed prior to jobs involving radiation exposure.
- c. Identify to the Radiation Safety Officer work activities, which have the potential for resulting in 5 man-rem or greater of exposure or activities, which the Supervisor believes merits an ALARA review.

3. All personnel

All ETI personnel are responsible for identifying radiation exposure problems and corrective measures, which may be taken to reduce radiation exposure.

VIII. ANNUAL RP PROGRAM REVIEW

The ETI Radiation Protection Program shall be reviewed at least annually. The review should evaluate the content and implementation of the program to ensure compliance with applicable regulations and terms of conditions of the facility

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radioactive material license. The review should also assess occupational doses and doses to members of the public to ensure they are ALARA.

The annual review may be conducted by ETI staff or by consultants. Individuals conducting the review should be knowledgeable of applied radiation protection practices and applicable regulations. Results of the review shall be documented. The documentation should include the date of the review, names(s) of the person(s) conducting the review, persons contacted by the reviewer, areas reviewed, review findings, corrective actions and follow-up.

If, during the course of the review, violations of regulatory requirements or license conditions are identified, the safety significance of each violation should be evaluated to set priorities and determine resources necessary to correct the violations. The violations should also be evaluated for required notification of and/or reporting to applicable regulatory agencies.

**EASTERN TECHNOLOGIES, INC.  
REQUIREMENTS AND PROCEDURES  
FOR  
BIOASSAYS**

APPROVED BY:



**MARK FELLOWS  
VICE PRESIDENT**

I. WHOLE BODY GROSS ACTIVITY ANALYSIS

A. When Required

1. Prior to issuing permanent dosimetry.
2. Upon termination of permanent dosimetry.
3. Annually.
4. As required by special cases (e.g.: ingestion, inhalation, or absorption of radioactive material, etc.)
5. As required by HP Supervisor or the RSO.

Notes:

1. Visitors are exempt from whole body gross activity analysis.
2. Urinalysis may be used in lieu of whole body gross activity analysis if circumstances warrant such action.

II. WHOLE BODY COUNTS

A. When Required

1. If whole body gross activity analysis indicates a cumulative activity  $\geq 1\mu\text{ci}$ . This activity is equal to 1% of the ALI for cesium 137 or 0.5% for cobalt 60.
2. Upon request by HP Supervisor or the RSO.

Note: Whole body counts may be performed by any facility whose instrument is properly operating and within its calibration date.

III. URINANALYSIS

If urinalysis is utilized, the sample is to be collected in the following manner:

- A. Use only sterile sample bottle.

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- B. Have appropriate personnel collect all liquid excreta.
- C. Label sample appropriately.
- D. Seal sample bottle.
- E. Send off site for analysis if appropriate.

**EASTERN TECHNOLOGIES, INC.  
PERSONNEL MANUAL  
FOR**

- I. CARE AND USE OF PERSONNEL  
MONITORING DEVICE (PMD)**
- II. PROTECTIVE APPAREL**
- III. MONITORING FOR PERSONNEL  
CONTAMINATION**

APPROVED BY:



**MARK FELLOWS  
VICE PRESIDENT**

I. CARE AND USE OF PERSONNEL MONITORING DEVICE (PMD'S)

A. Thermo Luminescent Dosimeter/Film Badge

1. Issue and Return

TLD/Film Badges should normally be picked up from and returned to the Health Physics office or at the entrance to the RCA. The TLD/Film Badge must be picked up before and properly worn during any entrance into a radiologically controlled area.

Note: Visitors are exempt from use issuance and use of TLD/Film Badges.

2. Use

a. Placement

In normal conditions the TLD/Film Badge should be worn on the chest. If more than one badge is issued, because of a particular RWP, the Health Physics Technician on duty or RSO will determine their placement.

b. Care

The TLD/Film Badge is not sensitive to shock but should be worn with care so as not to damage it. If your TLD badge is lost or becomes damaged, you should leave the radiation controlled area immediately and report to HP or RSO.

B. Self Reading Dosimeters (SRD's)

1. Issue and Return

SRD's will normally be picked up from and returned to the HP office or at the entrance to the RCA. The SRD must be picked up before and properly worn during any entrance into a radiologically controlled area.

2. Placement

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Unless otherwise directed by HP or RSO, SRD's should be worn at a point between the waist and the shoulders on the front of the torso.

3. Use

SRD's are used to measure your external gamma dose only. Read your SRD periodically (e.g.: every 15-30 minutes) while you are working in the radiologically controlled area to stay aware of radiological conditions in that area. You should always insure that your SRD is properly set before you enter a radiologically controlled area:

If while you are working you SRD either:

- A. Goes off scale, loses its display, or
- B. Reads higher than expected you should:
  - 1. Alert co-workers to check their SRD's
  - 2. Leave the area
  - 3. Notify HP or RSO
  - 4. Try to remember you last SRD reading.

4. Recording Exposure

The reading of the SRD should be recorded on the RWP sign in sheet upon entrance to and exit from the RCA. The difference between the two readings will determine the estimated amount of exposure received for that time period.

5. Care

Depending upon the type utilized, SRD's can be sensitive to heat, humidity, and impact. Care should be taken to avoid dropping/jarring the SRD or exposing it to contact with water or vapors. If digital dosimeters are utilized, error functions or loss of display indicate improper operation. If this occurs, leave the area

and contact HP or RSO. IF you are using a pocket ion chamber, dropping or jarring can cause the hairline to move up scale or go off scale. If this occurs you should leave the area and contact HP or RSO.

## II. PROTECTIVE APPAREL

### A. Protective Clothing

#### 1. Selection

The type and quantity of protective clothing to be used for a work activity within the RCA is listed on the Radiation Work Permit (RWP) associated with that job. Read the RWP carefully to ensure that all requirements are met.

#### 2. Use

Protective clothing should be used for the purpose for which it was designed.

Examples:

<u>Type</u>	<u>Use</u>
Skull Cap	Protect head, hair and forehead from contamination.
Hood	Protect head, hair forehead & neck from contamination
Coverall	Protect major portions of body from contamination (e.g.: chest, back, legs, arms)
Gloves	Protect hands from contamination
Booties	Protect shoes from contamination
Shoe Covers	Protect shoes from contamination
Plastic Suits	Protect whole body from liquids carrying contamination

3. Precautions

Protective clothing is not designed to protect ones body from radiation but rather to protect your body from coming in contact with contamination. Because most protective clothing is made from cloth, penetration of contamination through the material could result if proper work practices are not utilized. Care should be taken not to touch or rub contaminated equipment or areas anymore than necessary to perform a job function. Special attention should be paid to areas or equipment that might damage the protective clothing. Cuts or tears in protective clothing will allow contamination to reach the body. If the protective clothing is cut or torn while within the RCA you should stop the job function, leave the area, undress and check the area in question for contamination. If the skin is broken or contamination is found contact HP or the RSO.

4. Undressing

Protective clothing should be taken off in the following order.

- a. Remove tape or unlatch Velcro strips.
- b. Remove rubber shoe covers (leave clothing shoe covers or "booties" in place).
- c. Remove rubber gloves.
- d. Remove surgeon's cap or hood.
- e. Remove security badge and dosimetry.
- f. Remove coveralls.
- g. Remove booties (as you step on 2<sup>nd</sup> step off pad).
- h. Remove cotton glove liners.

B. Respiratory Protection

1. Selection

The type of respiratory protection to be used for a work activity within the RCA is listed on the RWP associated with the job.

2. Fitting The Mask

Don and adjust mask in fresh air only. Pull out headband straps, especially the "Front" or forehead strap so that the ends are at the buckle, then grip face piece between thumb and fingers. Insert chin well into lower part of face piece and pull headbands back overhead. To obtain a firm and comfortable fit against the face at all points, adjust headbands as follows:

- a. See that straps lie flat against head.
- b. Tighten lower or "Neck" straps.
- c. Tighten the "Side" straps (Do not touch forehead or "Front" strap).
- d. Place both hands on headband pad and push it towards the neck.
- e. Repeat operations b and c.
- f. Tighten forehead or "Front" strap a few notches if necessary.

3. Testing For Tightness

**THE FACE PIECE MUST BE SUBJECTED TO THE FOLLOWING TIGHTNESS TEST BEFORE EACH USE:**

Test the mask for tightness by holding the hand tightly over the air inlets to the filter. Inhale gently so that the face piece collapses slightly and hold the breath for ten seconds. The face piece should remain collapsed while the breath is held, providing the assembly is airtight. If any leakage is detected around the facial seal, readjust head harness straps and repeat test until there is no leakage. If other than facial seal leakage is detected, the condition must be investigated and corrected before another test is made. The face piece must pass the tightness test before the user should

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attempt to enter any Airborne Activity Area. The mask will not furnish protection unless all inhaled air is drawn through a suitable filter.

4. Precautions

a. Prior To Use

Do not enter any atmosphere with this mask unless you KNOW that:

1. The filter is the proper type for the contaminant or contaminants present.
2. Concentration of the contaminants does not exceed the concentration for which the assembly is approved. Do not enter atmospheres containing concentrations of contaminants, which are unknown or immediately dangerous to life or health.
3. Amount of oxygen is sufficient to support life (that is at least 19.5 percent oxygen by volume at sea level). If oxygen concentration sufficient to support life is questionable, use Self-Contained Breathing Apparatus only.
4. Mask does not leak (see test for tightness).
5. Filter does not need replacing.

b. During Use

Return to fresh air immediately if:

1. Leakage is detected.
2. High breathing resistance is encountered.
3. Any feeling of nausea, dizziness or ill being develops. (Individual may remove mask and immediately exit the area and report to HP or RSO)

### III. MONITORING FOR PERSONNEL CONTAMINATION

#### A. When

All personnel must monitor (“frisk”) themselves when exiting any contaminated area and upon leaving the RCA.

#### B. How

Using either of two pieces of equipment, a personnel contamination monitor or a frisker can perform frisking or monitoring for contamination. If a frisker is used the following techniques should be used.

- Ensure the “frisker” is “on”
- Ensure frisker is set to appropriate scale
- Ensure background less than 150 cpm
- Monitor hands prior to touching probe
- “Frisk” with probe within ½ inch of skin or clothing
- Go Slow! 1-2 inches per second
- “Frisk” all of your body’s or clothing’s external surface

**EASTERN TECHNOLOGIES, INC  
SECURITY PROVISIONS-PA  
FOR**

- I. VISITOR ACCES**
- II. PREVENTING THEFT OF RADIOACTIVE MATERIAL**

APPROVED BY:



**MARK FELLOWS  
VICE PRESIDENT**

Security Provisions-PA

I. VISITOR ACCESS

A. Policy Statement

Access to owner controlled or radiologically controlled areas of the ETI facility, by persons other than authorized employees, must be regulated and under the positive control of qualified ETI personnel. Under no circumstances is a person to be allowed access to a restricted area that does not meet the minimum requirements of section B below.

B. Access Requirements

The following are minimum requirements that must be met before any visitor will be allowed access to owner controlled or radiologically controlled areas:

1. Owner Controlled Area
  - a. Legitimate need for entry.
  - b. Has permission from appropriate supervisor.
2. Radiologically Controlled Area
  - a. Legitimate need for entry.
  - b. Has permission from upper level ETI management (e.g.: President, Vice President, Plant Manager, HP Supervisor).
  - c. Has completed required training and/or is going to be continuously escorted by personnel who have completed required training.
  - d. Has been issued monitoring devices, if required, in accordance with applicable procedures.

Note: The dose limit for visitors utilizing an SRD for entry is  $\leq 30$  mr for entire visit. Additionally, no high radiation and/or airborne activity areas may be entered.

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II. PREVENTING THEFT OF RADIOACTIVE MATERIAL

A. Access Control

1. Authorized

a. Public

Regulated in accordance with Section I above.

b. Employees

Access to owner controlled or radiologically controlled areas of the ETI facility by employees, are on a need to be there basis. This rule must be implemented by the appropriate supervisor.

2. Unauthorized

Unauthorized access to owner controlled or radiologically controlled areas of the ETI facility, during non-operational hours, will be controlled using the following techniques.

a. Security fence.

b. Lighting of area to expose unauthorized access.

c. All radiologically controlled areas within the fenced area will be locked during non-operational hours.

d. Police drive-by and observance of the facility and surrounding area.

B. Guidelines For The Removal Of Radioactive Material From Restricted Areas For Use By Personnel

1. Documentation

Forms detailing the item or items to be removed and the reason for their removal from the RCA must be submitted to proper supervisor. In addition, this form must include the proposed new

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location of the material and the estimated length of time it will be maintained there.

2. Permission

Permission to remove radioactive material from controlled areas must be received from ETI supervision prior to commencement of the removal process. Plant manager or a HP supervisor is the lowest tier supervisor that can grant permission.

3. Survey

HP must survey the material to determine associated radiological conditions and contamination levels.

4. Comparison

HP or the RSO must compare these conditions against the guidelines set forth in 10 CFR 20, to determine if the material can be released for the purpose stated.

5. Preparation

Item or items must be properly packaged, labeled and tagged.

6. Related Restrictions

Person responsible for control of the material must be informed of the restrictions relating to its use.

7. Acknowledgement

Person must acknowledge in writing that he has received these instructions.

**EASTERN TECHNOLOGIES, INC  
MONITORING AND/OR SURVEY REQUIREMENTS  
FOR**

- I. LIQUID RELEASES TO UNRESTRICTED AREAS**
- II. AIR RELEASES TO UNRESTRICTED AREAS**
- III. OWNER CONTROLLED AREA**
- IV. UNRESTRICTED AREA**

APPROVED BY:   
**MARK FELLOWS**  
**VICE PRESIDENT**

Monitor-Survey Requirements-PA

I. LIQUID RELEASES TO UNRESTRICTED AREAS

A. Minimum Requirements For Release

If a liquid release from the RCA to an unrestricted area is required, it must be performed in the following manner.

1. Obtain required sample.
2. Analyze sample to determine types and quantities of radioactive material present.
3. Evaluate against applicable NRC regulations.

Notes: 1. If quantities of radioactive material present exceed 75% of the limits of Appendix B, Table III of 10 CFR 20 the release can only be authorized by Plant Manager, HP Supervisor or RSO.

2. Each month's average concentration for individual isotopes should not exceed 90% of the values detailed in Appendix B, Table III of 10 CFR 20. Month to date isotopic concentrations should be reviewed to ensure that the release will not cause the month end average concentrations to exceed ALARA goals.

4. Receive proper permission.

Notes: 1. If quantities of radioactive material present are < 75% of the limits of Appendix B, Table III of 10 CFR 20 the Assistant Plant Manager or HP Technician can authorize releases.

2. Each month's average concentration for individual isotopes should not exceed 90% of the values detailed in Appendix B, Table III of 10 CFR 20. Month to date isotopic concentrations should be reviewed to ensure that the release will not cause the month end average concentrations to exceed ALARA goals.

Monitor-Survey Requirements-PA

5. If directed by supervision (e.g.: President, Vice President, Plant Manager, or HP Supervisor) implement proper methods to reduce quantities of material present to < 75% of allowable NRC limits.
6. Ensure all documentation is in order.
7. Make release.

B. Laboratory Procedures For Analysis Of Liquid Sample

The following guidelines should be followed for analyzing liquid samples. The information obtained can then be used to determine processing techniques and disposal methodology.

1. **Gross Beta/Gamma Activity Analysis via GM Tube and Scaler/Counter or Equivalent Instrument**
  - a. Collect sample in appropriate container.  
  
Note: Ensure large liquid sample is thoroughly mixed in container prior to transferring liquid to smaller receptacle.
  - b. Transport sample to lab area in accordance with proper practices and procedures.
  - c. Transfer 100 ml of sample to proper container for evaporation.
  - d. Evaporate (boil) sample to provide "residue" in planchette for counting.  
  
Note: During evaporation process other non-contaminated liquid may be added to the mix to wash down container surfaces so that all residual materials (radioactive material) will be located in planchette.
  - e. After complete evaporation, count sample as per appropriate procedure.
  - f. Properly document results of sample analysis.

Monitor-Survey Requirements-PA

- g. Ensure that all laboratory and sampling containers are properly cleaned.

2. Gross Alpha Activity Analysis via Eberline SAC-4 or Equivalent Instrument

- a. Collect sample in appropriate container.
- b. Transport sample to lab area in accordance with proper practices and procedures.
- c. Transfer 100 ml of sample to proper container for evaporations.

Note: Ensure sample is thoroughly mixed before and during transfer.

- d. Evaporate (boil sample to provide "residue" in planchette for counting.

Note: During evaporation process other non-contaminated liquid may be added to the mix to wash down container surfaces so that all residual materials (radioactive material) will be located in planchette.

- e. After complete evaporation, count sample using as per appropriate procedure.
- f. Properly document results of sample analysis.
- g. Ensure that all laboratory and sampling containers are properly cleaned.

3. Activity Analysis via Gamma Spectroscopy

- a. Obtain required sample.

Note: Ensure large liquid sample is thoroughly mixed in container prior to transferring to subsequent container or analysis apparatus.

Monitor-Survey Requirements-PA

- b. Transport samples to lab area in accordance with proper practices and procedures.
- c. If appropriate, transfer liquid into proper container for analysis.
- d. Analyze sample as per appropriate procedure.
- e. Properly document results of sample analysis.
- f. Ensure that all laboratory and sampling containers are properly cleaned.

II. AIR RELEASES TO UNRESTRICTED AREAS

If air releases from the RCA are required, the following guidelines and minimum requirements must be followed.

- A. Insure release point has proper sampling equipment installed (i.e.: regulated air sampler).

Note: Insure that sampler utilized is within its calibration period.

- B. If utilizing an alarming air monitor ensure alarm levels do not exceed effluent concentrations for air detailed in Appendix B, Table II, Column 1 of 10 CFR 20.

III. OWNER CONTROLLED AREA

- A. Area Controlled Area around Radiologically Controlled Areas will be monitored via Thermo Luminescent Dosimeters (TLD's). Locations and minimum quantities of TLD's are to be as follows:

<u>Location</u>	<u>Quantity</u>
Northern Boundary	1
Southern Boundary	1
Eastern Boundary	1
Western Boundary	1
Shipping & Receiving	1

Monitor-Survey Requirements-PA

Note: TLD's will be exchanged quarterly. Results will be documented and filed.

B. Area Contamination Survey

1. Surface Surveys

Surveys of the outside surfaces of the facility are to be taken on a quarterly basis. The results of the related analysis will be documented on the appropriate survey map.

Note: Periods of non-operation  $\geq$  survey interval negates requirement for survey.

2. Soil Samples

Soil samples of the owner controlled area are to be taken and analyzed quarterly. Samples are to be representative of the four (4) sides of the facility (i.e.: North, South, East, West) and must be taken from or near the same location each time. Samples may be analyzed through gross activity analysis or Gamma Spectroscopy. If gross activity analysis is utilized results are to be compared to initial baseline sample. Increases in differential activity of more than 50% will require investigation to determine if additional and/or more accurate analysis or corrective action is required. If Gamma Spectroscopy is utilized samples having an MPC greater than 25% of the value determined by the NRC to be acceptable for free release shall require investigation to determine if additional analysis or corrective action is required. All results must be documented and filed.

Note: Periods of non-operation  $\geq$  survey interval negates requirement for survey.

IV. UNRESTRICTED AREAS

A. Area Dose Rate Monitoring

Unrestricted areas surrounding Owner Controlled Area will not be monitored for associated does rates unless required by ETI management and/or appropriate licensing agencies.

Monitor-Survey Requirements-PA

B. Soil Samples

Soil samples of the unrestricted areas surrounding the owner-controlled area will not be taken unless required by ETI management, and/or the USNRS and permission from property owner can be obtained for sample collection.

**EASTERN TECHNOLOGIES, INC.  
PROCEDURES  
FOR**

- I. CONTAMINATION SURVEYS**
- II. DOSE RATE SURVEYS**

APPROVED BY:

  
MARK FELLOWS  
VICE PRESIDENT

Contamination-Dose Rate Surveys-PA

I. CONTAMINATION SURVEYS

A. Frequency

1. Operations Periods

a. Accessible Plant Areas

Utilized areas within the RCA that are readily accessible must be surveyed on a daily basis. Additional surveys may be required based on operational considerations, special activities or as directed HP or the RSO

Note: Daily surveys are not required for unutilized areas in which radiological conditions are unlikely to change. Performance of activities that do not affect radiological conditions also eliminate the requirement for daily surveys.

b. Inaccessible Areas

Areas of inaccessibility within the RCA (e.g.: ventilation filter housing, etc.) do not require a survey except during special entry or upon request by HP or the RSO.

2. Non-Operational Periods

a. Accessible Plant Areas

During periods of non-operation surveys are not required except as warranted by applicable conditions or as required by HP.

b. Inaccessible Areas

Areas of inaccessibility within the RCA (e.g.: ventilation filter housing, etc.) do not require a survey except during special entry or upon request by HP or the RSO.

B. Type

1. Smear Survey

Contamination-Dose Rate Surveys-PA

100-cm<sup>2</sup> smears taken at random intervals within the survey area. Number and location of smears to be based on associated operational considerations.

2. Gross Wipe

Minimum 300-cm<sup>2</sup> wipe taken at random intervals within the survey area. Number and location of wipes to be based on associated operational considerations.

3. Air Samples

Maximum twenty-four- (24) hour particulate air samples taken via appropriate collection device. Number and location of samples to be collected is to be based on associated operational considerations.

C. Posting

Re-Posting of contamination levels, determined by survey, will be accomplished, if required, as soon as possible after the survey has been completed. However if contamination levels could cause an up take to plant personnel (e.g.: > 100,000 dpm/100-cm<sup>2</sup>) posting will be done immediately. In addition re-posting of the area to a more restrictive or less restrictive area must be carried out if warranted by survey information.

D. Documentation

Survey will be documented on appropriate survey map.

II. DOSE RATE SURVEYS

A. Frequency

1. Operational Periods

a. Accessible Plant Areas

Utilized areas within the RCA that are readily accessible must be surveyed on a daily basis. Additional surveys may be required based on operational considerations, special activities or as directed HP or the RSO

## Contamination-Dose Rate Surveys-PA

Note: Daily surveys are not required for unutilized areas in which radiological conditions are unlikely to change. Performance of activities that do not affect radiological conditions also eliminate the requirement for daily surveys.

b. Inaccessible Areas

Areas of inaccessibility within the RCA (e.g.: ventilation filter housing, etc.) do not require a survey except during special entry or upon request by HP or the RSO.

2. Non-Operational Periods

a. Accessible Plant Areas

During periods of non-operation surveys are not required except as warranted by applicable conditions or as required by HP.

b. Inaccessible Areas

Areas of inaccessibility within the RCA (e.g.: ventilation filter housing, etc.) do not require a survey except during special entry or upon request by HP or the RSO.

B. Posting

Re-Posting of radiation levels, determined by the survey, will be accomplished, if required, as soon as possible after the survey has been completed. However if radiation levels could cause excessive exposure to plant personnel (e.g.: > 100 mrem/hr) posting will be done immediately. In addition re-posting of the area to a more restrictive or less restrictive area must be carried out if warranted by survey information.

C. Documentation

Survey will be documented on appropriate survey map.

**EASTERN TECHNOLOGIES, INC.  
POSTING AND CONTROL  
OF RADIOLOGICALLY  
RESTRICTED AREAS**

- I. POSTING REQUIREMENTS**
- II. CONTROL**

Approved By:   
**Mark Fellows**  
**Vice President**

I. POSTING REQUIREMENTS

Associated areas of the plant must be posted as follows if the stated requirements for posting are met.

A Radioactive Material Area

1 Definition

Radioactive Material Area - Any area or room, which contains radioactive material, other than natural uranium or thorium, in excess of ten (10) times the quantity of radioactive material specified in Appendix C of 10 CFR 20.

OR

Any area or room, which contains natural uranium or thorium in excess of one hundred (100) times the quantity specified in Appendix C of 10 CFR 20.

2. Required Posting

a. Entrance

Radiological warning signs displaying the logo "Caution-Radioactive Material (s)" or "Danger-Radioactive Material (s) Area" along with a standard trefoil in magenta printing on a yellow background.

b. Individual Items

Properly packaged radioactive material must be marked and labeled as follows:

1. "Caution - Radioactive Material (s)" or "Danger -Radioactive Material (s)"
2. Radiation levels
3. Date for which activity is estimated

Posting-Control Restricted Areas-PA

B. Radiation Area

1. Definition

Radiation Area - An area, accessible to individuals, in which radiation levels could result in an individual receiving a dose equivalent in excess of 0.005 rem (5 millirem) (0.05 Msv) in one hour at 30 centimeters from the radiation source or from the surface that the radiation penetrates.

2. Required Posting

Radiological warning signs posted at the entrance displaying the logo "Caution - Radiation Area" or "Danger - Radiation Area" along with a standard trifoil in magenta printed on a yellow background.

C. High Radiation Area

1. Definition

High Radiation Area - An area, accessible to individuals, in which radiation levels could result in an individual receiving a dose equivalent in excess of .01 rem (100 millirem) rem (1mSv) in one hour at 30 centimeters from the radiation source or from any surface that the radiation penetrates.

2. Required Posting

Radiological warning signs posted at the entrance displaying the logo "Caution - High Radiation Area" or "Danger - High Radiation Area" along with a standard trifoil in magenta printing on a yellow background.

D. Airborne Radioactivity Area

1. Definition

Airborne Radioactivity Area - A room, enclosure, or area, in which airborne radioactive materials composed wholly or partly of licensed material, exist in concentrations:

- a. In excess of the derived air concentrations (DACs) specified in Appendix B, Table I of 10 CFR 20.

Posting-Control Restricted Areas-PA

- b. To such a degree that an individual present in the area without respiratory protective equipment could exceed, during the hours the individual is present in a week, an intake of 0.6 percent of the annual limit on intake (ALI) or 12 DAC hours.

E. Contaminated Area

1. Definition

Contaminated Area - Any area or room, which contains significant removable surface radioactive contamination (e.g.: >1000 dpm/100cm<sup>2</sup> Beta/Gamma, or >150 dpm/100cm<sup>2</sup>, Alpha).

2. Required Posting

Radiological warning signs posted at the entrance displaying the logo "Caution - Contaminated Area" or "Danger - Contaminated Area" along with a standard trifoil in magenta printing on a yellow background.

F. Radiological Restricted Areas

1. Definition

Radiological Restricted Area - Any area, access to which is limited for the purpose of protecting individuals against undue risks from exposure to sources of radiation (e.g.: ventilation filter housing, etc.) and will not require a survey except during special entry.

2. Required Posting

Radiological warning signs describing the conditions associated with the restricted area, if known. These signs must display the appropriate logo or logos relating to the associated conditions, along with a standard trifoil in magenta printing in a yellow background.

II. CONTROL

A. Special Instructions

- 1. No eating, drinking, smoking or chewing is permitted inside the RCA unless the Radiation Safety Officer allows such behavior on a case by

Posting-Control Restricted Areas-PA

2. There shall be no unprotected wounds present on the body. Serious wounds shall be sealed with a suitable bandage prior to entry. There may be cases where a certain wound shall cause E.T.I. supervisory personnel to restrict a person to less contaminated areas and in some cases wounds may be serious enough to cause an individual to be denied access to RCA.

**B. Entry Requirements**

The following are minimum requirements that must be met by personnel before unrestricted entrance into the RCA will be allowed:

1. **Completed Rad Worker Training**

**Note:** If individual has not completed Rad Worker Training, entrance can be allowed so long as the individual is escorted by trained personnel.

2. **Had Whole body Gross Activity Analysis Performed**

**Notes:** 1. Unless otherwise directed by HP or the RSO, visitors are exempt from urinalysis testing.

2. Urinalysis may be used in lieu of urinalysis.

3. **Have been issued and are properly wearing required dosimetry.**

4. **Read and understand RWP.**

5. **Properly wearing the protective equipment required by the RWP governing that job or area.**

**C. Access Controls**

The following are minimum access controls that must be applied to applicable radiologically controlled areas.

1. **Radioactive Material Area**

Access governed by applicable RWP and or other related procedures.  
Area properly posted.

Posting-Control Restricted Areas-PA

2. Radiation Area

Access governed by applicable RWP and or other related procedures. Area properly posted.

3. High Radiation Area

Access governed by applicable RWP and or other related procedures. In addition, the area must be properly posted and barricaded. If practical the area should be locked to prevent access except when the access is required and positive control over each entry is maintained by HP or the RSO.

4. Airborne Radioactivity Area

Access governed by applicable RWP and or other related procedures. In addition the area must be properly posted and barricaded. If practical the area should be locked to prevent access except when the access is required and positive control over each entry is maintained by HP or the RSO.

5. Contaminated Area

Access governed by applicable RWP and or other related procedures. In addition the following minimum access controls must be put in force:

1. Area properly posted.
2. Designated entry/exit as marked by appropriate step off pads or other suitable device.
3. Barrier ropes (yellow & magenta) surrounding the area.

and/or

4. Boundary tape (yellow & magenta) on the floor surfaces to delineate the area.

Note: Boundaries may consist of external portions of equipment or walls.

6. Radiologically Restricted Areas

Access governed by applicable RWP and or other related procedures. In

Posting-Control Restricted Areas-PA

addition the area must be properly posted and barricaded. If practical the area should be locked to prevent access except when the access is required and positive control over each entry is maintained by HP or the RSO.

D. Required Corrective Actions

1. High Radiation Area

After area has been properly posted and the required access controls have been put in place the following actions are required.

- a. Determining the cause of the "High Radiation".
- b. Determine corrective actions needed to remove the cause of the "High Radiation".
- c. Implement a special RWP for the work, if required (Performed by HP or RSO).
- d. Implement the required corrective action.
- e. Re-survey the area to determine associated radiological conditions.
- f. If conditions permit re-post accordingly.

Note: All actions subject to HP or RSO approval.

2. Airborne Radioactivity Area

After area has been properly posted and the required access controls have been put in place the following actions are required:

- a. Determine the cause of "Airborne Radioactivity".
- b. Determine corrective actions needed to remove the cause of "Airborne Radioactivity". (i.e.: Remove excessive loose contamination, implement practical engineering changes, etc.)
- c. Implement a special RWP for the work, if required. (Performed by HP or the RSO)

Posting-Control Restricted Areas-PA

- d. Implement the required corrective action.
- e. Re-survey the area to determine associated radiological conditions.
- f. If conditions permit re-post accordingly.

Note: In non-accident conditions if airborne activity exceeds one (1) DAC, respiratory protection, having an appropriate protection factor, may be worn as long as dose received is ALARA. The cause of airborne activity will be mitigated to return airborne activity to <1 DAC before normal operations are resumed in the affected area.

EASTERN TECHNOLOGIES, INC.  
EMERGENCY ACTION GUIDE  
FOR  
TRANSPORTATION OF RADIOACTIVE MATERIALS

- I. MANAGEMENT ACTIONS
- II. CARRIER ACTIONS

APPROVED BY:



Mark Fellows  
Vice President

I. MANAGEMENT ACTIONS

Upon notification that an accident has occurred involving shipment of radioactive materials owned or transported by ETI the following management actions should be taken:

A. Determination

1. Determine if the accident requires reportability.  
(See Attached Copy of 49 CFR 171.15 & 171.16)
2. Determine if a container holding radioactive material has been breached.

B. Notification

The following agencies should be notified immediately.

1. Proper State agency in which the accident occurred.
2. Department of Transportation. (Per 49 CFR 171.15)
3. Particular facility to which the material belongs.
4. Pennsylvania Division of the NRC.

C. Response

The proper management personnel (e.g.: President, Vice President, HP Supervisor, RSO) must immediately take the following actions.

Note: These actions apply in circumstances in which a container holding radioactive material has been breached or appropriate authorities required assistance in determining current site radioactive conditions.

1. Gather appropriate equipment (e.g.: monitoring devices, postings, barriers, boundaries, protective apparel, smears, personal monitoring devices, etc.).
2. Transport or arrange for transport of the appropriate equipment to the accident site.

3. Travel to accident site as soon as possible.
4. One on site, determine and implement definitive protection and mitigation measures in accordance with applicable guidelines and regulations.
5. Cooperate at all times with appropriate authorities.

## II. CARRIER ACTIONS

The following type specific emergency instructions should be followed by the driver or drivers of the vehicle involved in an accident:

## III. EMERGENCY INSTRUCTIONS

### A. Radioactive Material, Low Specific Activity, N.O.S., 7, US2912

#### 1. Potential Hazards

##### a. Health Hazards

Fire may produce irritating or poisonous gases. Radioactive material; degree of hazard will vary from little to moderate, depending on type and quantity of radioactive material. Runoff from fire control or dilution water may cause pollution.

##### b. Fire or Explosion

Some of these materials may burn, but none of them ignites readily.

#### 2. Emergency Actions

##### a. General

Keep unnecessary people at least 150 feet upwind of spill. Isolate hazard area and deny entry. Limit entry to shortest possible time. Self-contained breathing apparatus (SCBA) and structural firefighter's protective clothing will provide limited protection. Delay clean up until arrival or instruction of qualified Radiation Authority. CALL

CHEMTREC AT 1-800-424-9300 FOR EMERGENCY ASSISTANCE. If water pollution occurs, notify the appropriate authorities.

b. Fire

Do not move damaged containers; move undamaged containers out of fire zone. Small fires: Dry chemical, CO<sub>2</sub>, Halon, water spray or standard foam. Large fires: Water spray, fog or standard foam is recommended.

c. Spill or Leak

Do not touch damaged containers or spilled material. Large spills: Dike far ahead of liquid spill for later disposal. Cover powder spill with plastic sheet or tarp to minimize spreading.

d. First Aid

Use first aid treatment according to the nature of the injury. If not affecting injury, remove and isolate contaminated clothing and shoes; wrap victim in blanket before transporting. If not injured, remove and isolate contaminated clothing and shoes; shower victim with soap and water. Advise medical personnel that injured persons may be contaminated with radioactive material.

B. Radioactive Material, N.O.S., 7, US2982

1. Potential Hazards

a. Health Hazards

External radiation from unshielded radioactive material. Internal radiation from inhalation, ingestion, or skin absorption. Radioactive material; degree of hazard will vary greatly, depending on type and quantity of radioactive material. Runoff from control or dilution water may cause pollution.

b. Fire or Explosion

Some of these materials may burn, but none of them ignites readily.

2. Emergency Action

a. General

Keep unnecessary people at least 150 feet upwind; greater distances may be necessary if advised by qualified Radiation Authority. Isolate hazard area and deny entry. Enter spill area only to save life; limit entry to shortest possible time. Self Contained Breathing Apparatus (SCBA) and structural firefighter's protective clothing will provide limited protection for short-term exposure to these materials. Detain uninjured persons and equipment exposed to radioactive material until arrival or instruction of qualified Radiation Authority. Delay clean up until arrival on instruction of qualified Radiation Authority. CALL CHEMTREC AT: 1-800-424-9300 FOR EMERGENCY ASSISTANCE. If water pollution occurs, notify the appropriate authorities.

b. Fire

Do not move damaged containers; move undamaged containers out of fire zone. Small fires: Dry chemical; CO<sub>2</sub>, Hallon, water spray or standard foam. Large fires: water spray, fog (flooding amounts). For massive fire in cargo area, use unmanned hose holder or monitor nozzles. Fight fire from maximum distance. Stay away from ends of tanks.

c. Spill or Leak

Do not touch damaged tanks or spilled material. Damage to outer container may not affect primary inner container. Small liquid spills: Take up with sand, earth or other noncombustible absorbent material. Large spills: Dike far ahead of spill for later disposal.

d. First Aid

Call emergency medical care. If not affecting injury,

remove and isolate contaminated clothing and shoe; wrap victim in blanket before transporting. If not injured, remove and isolate contaminated clothing and shoes; shower victim with soap and water. Except for the injured, detain persons and equipment exposed to radioactive materials until arrival or instruction of Radioactive Authority. Advise medical care personnel that injured persons may be contaminated with radioactive material.

C. Radioactive Material, Excepted Package-Limited Quantity of Material, 7, UN2910

Radioactive Materials, Excepted Package-Instruments or Articles, 7, UN2910; Radioactive Material, Excepted Package-EMPTY Packaging, 7, UN2910

1. Potential Hazards

a. Health Hazards

Fire may produce irritating or poisonous gases. Low-level radioactive material; little personal hazard.

b. Fire or Explosion

Some of these materials may burn, but none of them ignites readily.

2. Emergency Actions

a. General

Keep unnecessary people away. Isolate hazard area and deny entry. Self Contained Breathing Apparatus (SCBA) and structural firefighter's protective clothing will provide limited protection. Delay clean up until arrival on instruction of qualified Radiation Authority. CALL CHEMTRC AT 1-800-424-9300 AS SOON AS POSSIBLE. Especially if there is no local hazardous material team available.

b. Fire

EmerActionGuide-TransportRADMaterial-PA

Move container from fire area if you can do it without risk.  
Small fires: Dry chemical, CO2, Halon, water spray or standard foam.

c. Spill or Leak

Do not touch damaged containers or spilled material.  
Small Liquid Spills: Take up with sand, earth, or other noncombustible, absorbent material.

d. First Aid

Use first aid treatment according to the nature of the injury.  
Advise medical care personnel that injured persons may be contaminated with radioactive material.

**CODE OF FEDERAL REGULATIONS  
49 CFR CH. 1 (10-1-95 EDITION)  
§171.15 IMMEDIATE NOTICE OF CERTAIN  
HAZARDOUS MATERIALS INCIDENTS**

- (a) At the earliest practicable moment, each carrier who transports hazardous materials (including hazardous wastes) shall give notice in accordance with paragraph (b) of this section after each incident that occurs during the course of transportation (including loading, unloading and temporary storage) in which-
- (1) As a direct result of hazardous materials-
    - (i) A person is killed; or
    - (ii) A person received injuries requiring his or her hospitalization; or
    - (iii) Estimated carrier or other property damage exceeds \$50,000; or
    - (iv) An evacuation of the general public occurs lasting one or more hours; or
    - (v) One or more major transportation arteries or facilities are closed or shut down for one hour or more; or
    - (vi) The operational flight pattern or routine of an aircraft is altered or
  - (2) Fire, breakage, spillage, or suspected radioactive contamination occurs involving shipment of radioactive material (see also §174.45, 175.45, 176.48, and 177.807 of this subchapter); or
  - (3) Fire, breakage, spillage or suspected contamination occurs involving shipment of infectious substances (etiologic agents); or
  - (4) There has been a release of a marine pollutant in a quantity exceeding 450 L (119 gallons) for liquids or 400 kg (882 pounds) for solids; or
  - (5) A situation exists of such a nature (e.g., a continuing danger to life exists at the scene of the incident) that, in the judgment of the carrier, it should be reported to the Department even through it does not meet the criteria of paragraph (A) (1), (2) or (3) of this section.
- (b) Each notice required by paragraph (A) of this section shall be given to the Department by telephone (toll free) on 800-424-8802. Notice involving infectious substances (etiologic agents) may be given the Director, Center for Disease Control, U.S. Public Health Service, Atlanta, GA., 800-232-0124, in place of the notice to the Department or (toll call) on 202-267-2675. Each notice must include the following information:
- (1) Name of reporter.
  - (2) Name and address of carrier represented by reporter.
  - (3) Phone number where reporter can be contacted.
  - (4) Date, time, and location of incident.
  - (5) The extent of injuries, if any.
  - (6) Classification, name, and quantity of hazardous materials involved, if such information is available.
  - (7) Type of incident and nature of hazardous material involvement and whether a continuing danger to life exists at the scene.

- (c) Each Carrier making a report under this section shall also make the report required by §171.16.

Note: Under 40 CFR 302.6 EPA required persons in charge of facilities (including transport vehicles, vessels and aircraft) to report any release of a hazardous substance in a quantity equal to or greater than its reportable quantity, as soon as that person has knowledge of the release, to the U.S. Coast Guard National Response Center at (toll free) 800-424-8802 or (toll) 202-267-2675.

[Amdt. 171-7, 35 FR 16837, Oct. 3, 1970]

EDITORIAL NOTE: For Federal Register citations affecting §171.15, see the List of CFR Sections Affected appearing in the Finding Aids section of this volume.

**CODE OF FEDERAL REGULATIONS**  
**49 CFR CH. 1 (10-1-95 EDITION)**  
**§171.16 DETAILED HAZARDOUS MATERIALS**  
**INCIDENTS REPORTS**

- (a) Each carrier who transports hazardous materials shall report in writing, in duplicate, on DOT Form F 5800.1 (Rev. 6/89) to the Department within 30 days of the date of discovery, each incident that occurs during the course of transportation (including loading, unloading, and temporary storage) in which any of the circumstances set forth in §171.15(a) occurs or there has been an unintentional release of hazardous materials from a package (including a tank) or any quantity of hazardous waste has been discharged during transportation. If a report pertains to a hazardous waste discharge:
- (1) A copy of the hazardous waste manifest for the waste must be attached to the report; and
  - (2) An estimate of the quantity of the waste removed from the scene, the name and address of the facility to which it was taken, and the manner of disposition of any removed waste must be entered in Section IX of the report form (Form F 5800.1) (Rev. 6/89).
- (b) Each carrier making a report under this section shall send the report under this section shall send the report to the Information Systems Manager, DHM-63, Research and Special Programs Administration, Department of Transportation, Washington, DC 20590-0001; a copy of the report shall be retained, for a period of two years, at the carrier's principal place of business, or at other places as authorized and approved in writing by an agency of the Department of Transportation.
- (c) Except as provided in paragraph (d) of this section, the requirements of paragraph (a) of this section do not apply to incidents involving the unintentional release of hazardous materials being transported under the following proper shipping names:
- (1) Consumer commodity.
  - (2) Battery, electric storage, wet, filled with acid or alkali.
  - (3) Paint and paint related material when shipped in packaging of five gallons or less.
- (d) The exceptions to incident reporting provided in paragraph (c) of this section do not apply to:
- (1) Incidents required to be reported under §171.15(a);
  - (2) Incidents involving transportation aboard aircraft; nor
  - (3) Incidents involving the transportation of hazardous waste.

Note: A guideline document for assisting in the completion of DOT Form F 5800.1 (Rev. 6/89) may be obtained from the Office of Hazardous Materials Transportation, DHM-51, U.S. Department of Transportation, Washington, DC 20590-001.

[Amdt. 171-7, 35 FR 16837, Oct. 3, 1970, as amended by Amdt. 171-56, 45 FR 73683, Nov. 6, 1980; Amdt. No. 171-65, 47 FR 24584, June 7, 1982; Amdt. 171-72, 48 FR 17095, Apr. 21, 1983; Amdt. 171-101, 54 FR 25813, June 19, 1989; Amdt. 171-101, 54 FR 25813, June 19, 1989; Amdt. 171-109, 55 FR 39978, Oct. 1, 1990]

EASTERN TECHNOLOGIES, INC.  
EMERGENCY PROCEDURES  
FOR

- I. SPILLS
- II. ACCIDENTAL RELEASE OR LOSS OF MATERIAL
- III. ACCIDENTAL CONTAMINATION OF PERSONNEL
- IV. FIRE

APPROVED BY:   
MARK FELLOWS  
VICE PRESIDENT

Emergency Procedures-PA

I. SPILLS

A. Minor Spills

Note: Minor spills are defined as spills involving minor radiation hazards to personnel.

1. Stop or confine the spill immediately, if possible.
2. Clear personnel not involved in containing and cleaning up the spill from the area.
3. Notify the Facility Supervisor or Foreman, HP and Radiation Safety Officer.
4. HP or RSO will determine personnel and area monitoring needs and implement appropriate action to clear personnel and return area to normal conditions.
5. Work may be resumed when the area is returned to a normal condition.

B. Major Spills

Note: Major spills are defined as spills involving major radiation hazard to personnel.

1. Stop or confine the spill immediately, if possible.
2. Notify ETI Supervision Immediately.
3. Clear personnel from the area and restrict entry by roping off and posting the area.
4. HP or RSO will determine personnel and area monitoring needs and implement appropriate action to clear personnel and return area to normal conditions.
5. Notify Pennsylvania Division of NRC.
6. Work will not be resumed until the area is returned to a normal condition and the cause of the spill is corrected.

Emergency Procedures-PA

II. ACCIDENTAL RELEASE OR LOSS OR RADIOACTIVE MATERIAL

A. Liquid

For accidental release of contaminated liquid

1. Stop release.
2. Determine quantities and levels of release.
3. Evaluate release against regulations.
4. Report if necessary.
5. Implement mitigating actions.

B. Solid

For accidental loss of contaminated material

1. Implement search for lost material.
2. Determine hazards involved.
3. Investigate causes for loss of material.
4. Evaluate against regulations.
5. Report if necessary.

C. Airborne

For accidental release of airborne radioactive material

1. Stop or reduce release as much as possible.
2. Evaluate against regulations.
3. Report if necessary.

III. ACCIDENTAL CONTAMINATION OF PERSONNEL

A. External Contamination

Emergency Procedures-PA

1. Monitor personnel to determine extent of external contamination.
2. Evaluate extent of hazard to individual.
3. If contamination is localized, gently clean area using warm water and a mild cleansing agent.
4. If gross contamination exists individual must shower to clean effected areas.
5. Care should be used during any decontamination activity to ensure that contamination does not enter the eyes and that the skin is not abraded during cleaning.
6. After appropriate decontamination, survey to ensure that contamination has been removed.
7. Repeat steps as necessary.
8. Report if necessary.

B. Internal Contamination

1. Determine amount ingested or inhaled (whole body count).
2. Track progress through body (urinalysis and fecal analysis).
3. Determine if radioactive material voiding techniques should be used to decrease retention time.
4. Report if necessary.

IV. FIRE

The following actions should be taken for fires located in

A. System, Components or Equipment

1. Notify Fire Department.
2. Senior person in charge will determine requirements for protective clothing and respiratory protection.

Emergency Procedures-PA

3. If appropriate and possible turn system, component or equipment off.
4. Implement appropriate extinguishing method based on type of fire (e.g.: electrical, gas, cloth, etc.).
5. After fire is extinguished monitor personnel.
6. If personnel are contaminated, implement appropriate decontamination method.
7. Determine if the fire caused a release of radioactive materials.
8. If a release was caused determine type and quantity of release.
9. Evaluate against regulations.
10. Report if necessary.

B. General Area

1. Notify Fire Department.
2. Senior person in charge will determine requirements for protective clothing or respiratory protection.
3. Implement appropriate extinguishing method based on type of fire (e.g.: electrical, gas, cloth, etc.).
4. After fire is extinguished monitor personnel for contamination.
5. If personnel are contaminated implement appropriate decontamination method.
6. Determine if the fire caused a release of radioactive materials.
7. If a release was caused determine type and quantity of release.
8. Evaluate against regulation.
9. Report if necessary.

**EASTERN TECHNOLOGIES, INC.  
PROCEDURES  
FOR**

- I. INCOMING RADIOACTIVE MATERIAL SHIPMENTS**
- II. HANDLING OF CONTAMINATED ITEMS**
- III. ENTRANCE/EXIT AND MATERIAL TRANSFER GUIDELINES FOR CONTAMINATED AREAS**
- IV. HANDLING OF CONTAMINATED LIQUIDS**
- V. HANDLING OF CONTAMINATED SOLID WASTE**
- VI. HANDLING OF CONTAMINATED SLUDGE WASTE**
- VII. SURVEY AND RELEASE GUIDELINES FOR UNRESTRICTED RELEASE OF MATERIAL FROM THE RCA**

APPROVED BY:

  
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**MARK FELLOWS**  
**VICE PRESIDENT**

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I. INCOMING RADIOACTIVE MATERIAL SHIPMENTS

A. Minimum Information Guidelines

1. Labeling

Incoming containers and/or packages of radioactive material must be properly labeled (i.e.: Radioactive-LSA, Radioactive Material, etc.), if applicable.

2. Shipping Papers

Incoming shipments of radioactive material must be accompanied by appropriate shipping papers (i.e.: Radioactive Material Shipment Record, Bill of Lading). Shipping papers should at a minimum detail:

- a. Inventory of shipment contents (i.e.: number of packages, package contents, etc.).
- b. Principle isotopes (> 1% abundance).
- c. Activity content.
- d. Associated dose rate (s).
- e. Contamination levels.

B. Survey Guidelines

1. Incoming Laundry Shipments

a. External Survey

Incoming shipments of laundry should, at a minimum, be externally surveyed for associated dose rates and contamination. Contact dose rates of the vehicle/external-shipping package (i.e.: trailer, straight truck, and etc. should be taken to ensure that the shipment dose rates do not exceed ETI administrative dose limits (e.g.: 50mr/hr) or applicable DOT dose limits. Smears of the vehicle/external-shipping package (i.e.: trailer, straight

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truck, etc.) should also be taken to confirm the presence or absence of smearable contamination. Vehicles/external-shipping packages meeting unrestricted acceptability requirements (e.g.: dose rates  $\leq$  applicable DOT limits, dose rates  $\leq$  50 mr/hr,  $<$  MDA smearable contamination) may be further processed (i.e.: survey of internal shipping containers, placement of external shipping package into laundry facility) for subsequent unloading of containers or material as applicable.

b. Internal Survey

1. Internal Containers

After completion of the vehicle/external-shipping package (i.e.: trailer, straight truck, etc.) survey, internal containers of laundry should, at a minimum, be surveyed for associated dose rates and contamination. Contact dose rates should be taken of each container, prior to unloading, to ensure that the container dose rates do not exceed ETI administration dose limits (e.g.: 50 mr/hr). Smears of each container should be taken prior to unloading, to confirm the presence or absence of smearable contamination. Containers meeting unrestricted acceptability requirements (e.g.:  $\leq$  50 mr/hr and  $<$  1,000 dpm/100 cm<sup>2</sup> smearable contamination) may be off loaded for processing.

Note: Use For sea/land type container shipments of material contained within numerous individual bags, the survey requirements will be modified to eliminate the requirement for external contamination surveys of each bag. Dose rate surveys of each bag are still required prior to opening the bag for sorting/processing. General area contamination surveys will ensure such action does not create contamination issues.

2. Internal Area

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During removal of internal shipping containers of packages the internal cargo area of the shipment vehicle (i.e.: trailer, straight truck, etc.) should be surveyed to confirm the presence or absence of contamination. Should the internal cargo area meet ETI unrestricted release criteria (e.g.: smearable contamination < MDA), the shipping containers may be removed.

2. Incoming Mobile Units

a. External Survey

Incoming mobile unit shipments should, at a minimum, be externally surveyed upon arrival or as soon as practical for associated dose rates and contamination. Contact dose rates of the external-shipping package (i.e.: trailer) should be taken to ensure compliance with applicable DOT dose limitations. Smears of the external shipping package (i.e.: trailer) should also be taken to confirm the presence or absence of contamination. Mobile units meeting unrestricted acceptability requirements (e.g.: dose rates  $\leq$  applicable DOT limits, < MDA smearable contamination) may be posted, as applicable, and stored.

b. Internal Survey

Internal surveys of incoming mobile units are not necessary unless entry into the mobile unit is required or such survey is requested by management (i.e.: HP Supervisor, Plant Manager, RSO, etc.) on a case-by-case basis.

Surveys performed to allow inspection of the exposed interior of the mobile unit must, at a minimum, determine area dose rates and contamination levels. Entry into the mobile unit, by persons not involved in the performance of the survey, should not be allowed until radiological conditions within the trailer are known. Inspection of closed areas or systems potentially containing internal contamination is not allowed unless additional surveys are performed to determine the radiological conditions of the

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area in question. Protective clothing requirements, if any, will be determined by Health Physics or other appropriate personnel (i.e.: RSO, etc.) based on the results of the survey.

C. Discrepancy Actions

1. Incoming Laundry Shipments

a. Shipping Paper Discrepancies

1. Determine severity of error and/or omissions.
2. Determine reportability requirements.
3. Contact shipped for corrected and/or missing information.
4. Report incident to appropriate agencies if required.
5. Fill out and file a Radioactive Material Receipt Discrepancy Report.

b. Shipment Content Discrepancies

Laundry shipments having containers that are not properly listed on the shipping papers should be in-processed as follows:

1. Isolate and do not open the container.
2. Immediately determine the dose rate of the container.
3. Determine if the dose rate poses a danger (100 mr/hr or above) or exceeds the maximum limits permissible (50 mr/hr) for an incoming container.
4. If the dose rate poses a danger, evacuate the area, post the area, put up boundaries at safe distances from the container, contact shipper, and access

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reportability requirements. If reportability is required as per 49 CFR 171.15, contact appropriate authorities, advise of the situation, and take agreed upon actions.

5. If reportability is not required and the dose rate does not pose a danger, notify the shipper of the discrepancy and obtain as much information about the contents of the container as possible.
6. Determine the contamination levels, if any, on the outside of the container.  
  
\*If contamination levels equal or exceed 1,000 DPM/100 cm<sup>2</sup> the container must be decontaminated.
7. If the container is preventing the unloading of other properly listed containers, it may be temporarily unloaded but not opened.
8. If the dose rate of the container exceeds maximum permissible limits for an incoming container, it must be examined for shipping acceptability then reloaded for return shipment.
9. If the dose rate of the container is within permissible limits for an incoming container and the contents of the container can be determined beyond doubt, the container may be unloaded and taken into the appropriate area of the RCA for processing.
10. Fill out and file a "Radioactive Material Receipt Discrepancy Report."

c. Excessive Contamination And/Or Dose Rate Discrepancies

Should the survey of an incoming laundry shipment identify contamination and/or dose rate levels in excess of ETI administrative and/or license limits and/or applicable DOT regulations, it should be in-processed as follows:

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1. Determine if the dose rate poses a danger (e.g.: > 100 mr/hr).
  2. If the dose rate poses a danger, evacuate the area, put up boundaries at safe distances from the vehicle, contact the shipper, and access reportability requirements. If reportability is required as per 49 CFR 171.15, contact appropriate authorities, advise of the situation, and take agreed upon actions.
  3. Determine if the contamination levels pose undue risk of personnel or area contamination (e.g.: > 1,000 dpm).
  4. If undue contamination exposure exists, restrict access to the area through postings and boundaries, contact shipper, and access reportability requirements. If reportability is required as per 49 CFR 171.15, contact appropriate authorities, advise of the situation, and take agreed upon actions.
  5. If contamination levels do not exceed regulatory limits, the vehicle or container may be decontaminated.
  6. Fill out and file a "Radioactive Material Receipt Discrepancy Report".
2. Incoming Mobile Unit Shipments
- a. Shipping Paper Discrepancies
    1. Determine severity of errors and/or omissions.
    2. Determine reportability requirements.
    3. Contact shipper for corrected and/or missing information.
    4. Report incident to appropriate agencies, if required.

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5. Fill out and file a "Radioactive Material Receipt Discrepancy Report."

b. Shipment Content Discrepancies

Mobile units having containers or items that are not properly listed on the shipping papers should be in-processed as follows:

1. Isolate item or container and do not open if applicable.
2. Immediately determine the dose rate of the container or item.
3. Determine if the dose rate poses a danger ( $> 100$  mr/hr) or exceed the maximum limits (50 mr/hr) permissible for incoming items or containers.
4. If the dose rate poses a danger evacuate the area, post the area, put up boundaries at safe distances from the container, contact shipper, and access reportability requirements. If reportability is required as per 49 CFR 171.15, contact appropriate authorities, advise of the situation, and take agreed upon actions.
5. If reportability is not required and the dose rate does not pose a danger, notify the shipper of the discrepancy and obtain as much information about the item or contents of the container as possible.
6. Determine the contamination levels, if any, of the item or container.

Note: If contamination levels equal or exceed 1,000 dpm/100 cm<sup>2</sup> the item or container should be decontaminated or contained.

7. If the item or container is preventing the performance of required activities it may be unloaded.

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8. If the dose rate of the item or container exceeds maximum permissible license limits, the item or container must be examined for shipping acceptability and readied for return shipment.
  9. If the dose rate of the item or container is within permissible limits and the item or contents of the container can be determined beyond doubt and the item or container belongs to ETI, then the item or container may be unloaded and/or processed and stored as required.
  10. Fill out and file a "Radioactive Material Receipt Discrepancy Report".
- c. Excessive Mobile Unit Contamination And/Or Dose Rate Discrepancies

Should the survey of an incoming mobile unit identify contamination and/or dose rate levels in excess of ETI administrative and/or license limits and/or applicable DOT regulations, it should be in-processed as follows:

1. Determine if the dose rate poses a danger (e.g.: > 100 mr/hr).
2. If the dose rate poses a danger, evacuate the area, put up boundaries at safe distances from the vehicle, contact the shipper, and access reportability requirements. If reportability is required as per 49 CFR 171.15, contact appropriate authorities, advise of the situation, and take agreed upon actions.
3. Determine if the contamination levels pose undue risk of personnel or area contamination (e.g.: > 1,000 dpm).
4. If undue contamination exposure exists, restrict access to the area through postings and boundaries, contact shipper, and access reportability requirements. If reportability is required as per 49

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CFR 141.15, contact appropriate authorities, advise of the situation, and take agreed upon actions.

5. If contamination levels do not exceed regulatory limits, the vehicle or container may be decontaminated.
6. Fill out and file a "Radioactive Material Receipt Discrepancy Report".

II. HANDLING OF CONTAMIANATED ITEMS

A. Apparel Items

1. Protective Apparel

a. Protective Clothing

1. Sorting

Unless otherwise directed by HP or the RSO, sorting of unprocessed (unwashed) protective clothing should only be performed in an operating sorting table located in the designated sorting area. Careless handlings during container unload and sorting (e.g.: throwing, shaking, etc.) must be avoided to minimize the potential for airborne contamination. Contact of uncovered skin (e.g.: face) with in process items or protective clothing being worn must be avoided.

2. Transfer

Transfer of sorted items must be accomplished in a manner that limits the possible spread of contamination. Unless otherwise directed by HP or the RSO reusable devices (e.g.: automated slings, buggies, reusable bags, etc.) must be used for transporting items from the sorting area to the wash area.

b. Respiratory Protection Devices (RPD's)

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### 1. Sorting

Unless otherwise directed by HP or the RSO, RPD's should only be removed from their container and sorted for washing and sanitizing in the area designated by HP or the RSO for such activity.

### 2. Transfer

If transfer of in-process RPD's is required prior to washing, this must be accomplished in a manner that limits the possible spread of contamination. Unless otherwise directed by HP or the RSO reusable devices (e.g.: automated slings, buggies, reusable bags, etc.) must be used for transporting these items from the sorting area to the wash area.

## 2. Non-Protective Apparel

### a. Cloth

#### 1. Sorting

Unless otherwise directed by HP or the RSO, sorting of un-processed (unwashed) cloth items (e.g.: towels, rags, bags, modesty garments) should only be performed in an operating sorting table located in the designated sorting area. Careless handling during unloads and sorting (e.g.: throwing, shaking, etc.) must be avoided to minimize the potential for airborne contamination. Contact of uncovered skin (e.g.: face) with in-process items or protective clothing being worn must be avoided.

#### 2. Transfer

Transfer of sorted items must be accomplished in a manner that limits the possible spread of contamination. Unless otherwise directed by HP or the RSO, reusable devices (e.g.: automated slings, buggies, reusable bags, etc.) must be used for

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transporting items from the sorting area to the wash area.

b. Other

1. Sorting

Unless otherwise directed by HP or the RSO, sorting of unprocessed machine washable items (e.g.: rain suits, etc.) that do not fall into the above-mentioned categories should only be performed in an operating sorting table located in the designated sorting area. Careless handlings during unload and sorting (e.g.: throwing, shaking, etc.) must be avoided to minimize the potential for airborne contamination. Contact of uncovered skin (e.g.: face) with in process items or protective clothing being worn must be avoided.

2. Transfer

Transfer of sorted items must be accomplished in a manner that limits the possible spread of contamination. Unless otherwise directed by HP or the RSO, reusable devices (e.g.: automated slings, buggies, reusable bags, etc.) must be used for transporting items from the sorting area to the wash area.

B. Non Apparel Items

1. Machine Washable

a. Sorting

Unless otherwise directed by HP or the RSO, sorting of unprocessed machine washable items (e.g.: slings, straps, mop heads, etc.) should only be performed in the area designated by HP or the RSO for such activity. Careless handlings during unload and sorting (e.g.: throwing, shaking, etc.) must be avoided to minimize the potential for airborne contamination. Contact of uncovered skin (e.g.:

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face) with in process items or protective clothing being worn must be avoided.

b. Transfer

Transfer of sorted items must be accomplished in a manner that limits the possible spread of contamination. Unless otherwise directed by HP or the RSO, reusable devices (e.g.: automated slings, buggies, reusable bags, etc.) must be used for transporting items from the sorting area to the wash area.

2. Other

a. Received From Shipper

1. Sorting

Unless otherwise directed by HP or the RSO, sorting of items that are not machine washable (e.g.: tools, equipment, etc.) should only be performed in the area designated by HP or the RSO for such activity. Careless handling during unloading and sorting (e.g.: throwing, shaking, etc.) must be avoided to minimize the potential for airborne contamination. Contact of uncovered skin (e.g.: face) with in process items or protective clothing being worn must be avoided.

2. Transfer

If transfer of these items to a decon area is required, this must be accomplished in a manner that limits the possible spread of contamination. Unless otherwise directed by HP or the RSO, reusable devices (e.g.: automated slings, buggies, reusable bags, etc.) must be used for transporting items from the sorting area to the wash area.

b. In House

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Unless otherwise directed by HP or the RSO, items that are generated in house that are not machine washable (i.e.: tools, equipments, etc.) must be handled in the following manner:

1. Determine the contamination levels associated with item.
2. If high contamination levels exist (e.g.: > 100,000 dpm/100 cm<sup>2</sup> Beta, Gamma) and transfer of the item to another location within the contaminated area is required, the item must either be decontaminated at its present location before movement or placed into a container for movement.
3. If movement outside of a contaminated area is required, the equipment will be decontaminated to < 1,000 dpm/100 cm<sup>2</sup> Beta, Gamma or wrapped or placed in an appropriate container for transfer.
4. If work is to be performed on the item it must be done in the place designated by HP or the RSO for the activity and must conform with the radiological precautions and guidelines set down by the HP or RSO covering the job.

**III. ENTRANCE/EXIT AND MATERIAL TRANSFER GUIDELINES FOR CONTAMINATED AREAS**

**A. Entrance Guidelines**

The following are minimum requirements that must be met by personnel before entrance into a contaminated area is allowed.

1. Completed Rad Worker Training

Note: If individual has not completed Rad Worker Training, entrance may be allowed so long as trained personnel escort the individual.

2. Had incoming bioassay performed.

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Note: Unless otherwise directed by HP or the RSO, visitors are exempt from testing.

3. Have been issued and are properly wearing required dosimetry.
4. Read and understand RWP.
5. Properly wearing the protective equipment required by the RWP governing that job or area.

**B. Exit Guidelines (Personnel)**

The following requirements must be followed for proper exit from a contaminated area:

**1. Remove Protective Clothing**

Remove protective clothing in the proper sequence so as to limit the chance of becoming contaminated by you protective clothing. Proper sequence is as follows:

- a. Remove tape or unlatch Velcro strips.
- b. Remove rubber shoe covers (leave cloth shoe covers or "booties" in place).
- c. Remove rubber gloves.
- d. Remove surgeon's cap or hood.
- e. Remove dosimetry and other badges as required.
- f. Remove coveralls.
- g. Remove booties (as you step onto step off pad).
- h. Remove cotton glove liners.

**2. Perform A Whole Body Frisk**

Frisking or monitoring for contamination can be performed by using either of two pieces of equipment, a personnel contamination

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monitor or a frisker. If a frisker is used, the following techniques should be used:

- Ensure “frisker” is “on”.
- Ensure frisker is on appropriate scale.
- Ensure Background is < 150 cpm.
- Frisk hands prior to touching probe.
- “Frisk” with probe within ½ inch of the surface.
- Move probe 1-2 inches per second.
- “Frisk” all of your body’s or clothing’s external surface.

### C. Material Transfer Guidelines

The following are guidelines and requirements for the transfer of material into or out of contaminated areas:

#### 1. Transfer In (Guidelines)

The following guidelines should be followed before taking any items into a contaminated area.

- a. Remove any unnecessary packaging.
- b. Take only the items that are needed.
- c. Do not use “clean” tools or equipment in a contaminated area if others are more suitable for the job.
- d. If “clean” tools or equipment must be used they should be protected to reduce the chance of contamination (if practical).

#### 2. Transfer Out (Requirements)

Unless otherwise directed by HP or the RSO, the following are

## Rad Handling Procedure-PA

requirements that must be met or performed prior to or during the removal of an item from a contaminated area:

- a. Smear surfaces of the item to determine contaminated levels.
- b. If smearable contamination is discovered equaling or exceeding 1,000-dpm/100 cm<sup>2</sup>, the item must be decontaminated to acceptable levels (e.g.: < 1,000 dpm/100 cm<sup>2</sup>) or placed inside of a protective covering prior to or during transfer from contaminated area.
- c. Contaminated items placed in bags or protective coverings should be sealed, surveyed for dose rate, and appropriately tagged.
- d. Items free of smearable contamination shall be surveyed for dose rate and appropriately tagged, if applicable.

Note: Items may not be removed from the RCA until they are surveyed and released by HP or the RSO.

### IV. HANDLING OF CONTAMINATED LIQUIDS

#### A. Definition

Contaminated Liquid: any flowable fluid that remains "Liquid" at standard temperature and pressure and that contains "Radioactive Material" in concentrations > 25% of applicable 10CFR20 limits.

#### B. Associated Hazards

The largest hazard associated with contaminated liquids is their ability to transfer entrapped radioactive material onto other surfaces very easily by spillage, leakage, or volatilization.

#### C. Handling Instructions

1. Parts of the body which may come in contact with the fluid must be adequately covered, as stipulated by the governing RWP or as

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required by HP or the RSO, to prevent contamination during handling.

2. If volume exceeds one gallon, all transported liquids must be contained in a non-shattering closed transport container to ensure no spillage, even if the sample is dropped.
3. If sample volume exceeds 2,000 ml, appropriate lab surfaces should be “diked” to prevent spread if sample is spilled during analysis.

D. Receiving Permission For Transport

Permission to transport large volumes (e.g.: > 5 gallons) of contaminated liquids will be received only after appropriate supervision (e.g.: plant manager, HP, RSO) has reviewed the proposed transport process to ensure that all safety measures are taken to prevent spillage, and that in the event a spill does occur it can be quickly contained and dealt within an expedient manner.

V. HANDLING OF CONTAMINATED SOLID WASTE

A. Definition

Contaminated Solid Waste: A radioactively contaminated solid material that no longer has utility.

B. Processing

The following guidelines should be met to ensure that radioactive wastes are properly handled thereby ensuring personnel safety and volume reduction to the maximum possible extent.

1. All involved personnel must use applicable protective clothing and devices as stipulated by the appropriate RWP or as directed by HP of the RSP.
2. Wastes must be appropriately segregated and marked and/or tagged for identification.
3. Containers should be surveyed on a periodic basis, determined by HP or the RSO, to determine radiological hazards present, if any.

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4. Wastes are not returned to originator must be carefully surveyed to determine the presence or absence of radioactive material.
5. If waste contains radioactive material, it must be segregated and processed for disposal or transport to a processor for volume reduction.
6. If wastes are not found to contain radioactive material, the wastes should be placed with other non-radiological wastes for processing through normal means.

Note: See Section VII of this procedure for applicable survey and release guidelines.

C. Methods To Reduce Solid Radioactive Waste Volume

1. Use only necessary expendables when wrapping or bagging radioactive material.
2. Wrap laundry, tools, and equipment as directed by Health Physics to prevent gross contamination that could result in excessive radwaste production from cleaning efforts.
3. Use the smallest bag possible for wrapping and bagging.
4. Do not place contaminated laundry, tools, or equipment with clean ones.
5. Remove tools and equipment from the contaminated work area as soon as practical after work is completed and place them in the designated storage area. Contaminated items should be transferred to clean poly bags as they cross the step-off pad into a clean area. Never remove a potentially contaminated tool or piece of equipment from a bag without Health Physics performing a survey.
6. Removal of large items (drums, ladders, gas bottles, scaffolds) from a contaminated area will be coordinated with H.P.
7. Place contaminated items inside bags or containers when not in use and when work is completed.

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8. Take only the necessary tools, equipment, and supplies into a contaminated work area. Promptly remove them when work is complete.
9. Place contaminated tools, equipment, respirators, PCs, and waste into appropriate containers after use.
10. Minimize the amount of paperwork that you carry into the RCA.
11. Cardboard boxes and other unnecessary packaging material should not be taken into the RCA.
12. Prior to taking new tools into the RCA to accomplish a task, check with appropriate personnel to see if tools already exist for the work in the RCA.
13. Comply with the radioactive waste-sorting program. Do not place both contaminate and non-contaminated trash in the same container.
14. Do not dispose of pressurized spray cans in radwaste containers.
15. Do not put burned-out bulbs or sharp, pointed objects in radwaste drums.
16. DO NOT put liquids or containers holding liquid in radwaste containers.

VI. HANDLING OF CONTAMINATED SLUDGE WASTE

A. Definition

Contaminated Sludge Waste: The contaminated waste material found in the bottom of tanks and pits that results from the operation of the plant. Does not include lint, rocks, miscellaneous parts or other easily identifiable materials.

B. Handling

Due to the varying conditions associated with this activity, methods of removal and handling instructions for sludge waste must be approved by

## Rad Handling Procedure-PA

HP or the RSO on a case-by-case basis. After removal, sludge waste must be processed (by qualified plant personnel or by qualified vendor) to meet applicable burial ground requirements.

### C. Processing

Based on the requirements, at the time of generation, acceptable processing of contaminated sludge waste for transfer to a burial facility or processor can include by may not be limited to the following:

1. Dewatering
2. Compacting
3. Drying
4. Solidification
5. Combination of Above

All processing techniques are subject to HP or RSO approval.

Note: It should be noted that the above-mentioned processes are not all inclusive. Requirements for burial or transportation may change thus causing a change in the method of processing.

## VII. SURVEY AND RELEASE GUIDELINES FOR UNRESTRICTED RELEASE OF MATERIAL FROM THE RCA

### A. Liquids, Sludge and Bulk Solid Material

#### 1. Action Levels

Liquids, Sludge and bulk solid material having radioactive material concentrations indistinguishable from background shall be considered as acceptable for "unrestricted release" from the RCA. Unrestricted release shall be considered to mean release of material from ETI's RCA to areas not under the control of ETI or its' radioactive material license. Material having concentrations of radioactive material in excess of applicable guidelines shall be considered contaminated material and must be processed for disposal as radioactive waste or radioactive by-product material.

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2. Survey Methods

Liquids, Sludge, and bulk solid material should be surveyed through gamma spectroscopy. Care should be given to ensure that the material is a homogenous mix so as to ensure that the sample being counted is representative. Protocol for counting liquid samples shall guide sample preparation and counting.

B. Solid Material

1. Action Levels

Solid material having fixed and smearable contamination levels indistinguishable from background using a calibrated frisker and GM Tube Combination shall be considered as acceptable for "unrestricted release" from the RCA. Unrestricted release shall be considered to mean release of material from ETI's RCA to areas not under the control of ETI or its' radioactive material license. Material having concentrations of radioactive material in excess of applicable guidelines shall be considered contaminated material and must be processed for disposal as radioactive waste or radioactive by-product material.

2. Survey Methods

a. Direct Survey of Material

Using a frisker and hand held pancake type GM Tube survey item to be released with a scan speed not to exceed two inches per second. Ensure detector window is  $\leq \frac{1}{2}$ " from surface of material being surveyed.

Note: Other survey methods or equipment having the ability to detect radioactive material at or below administrative action levels may be used.

b. Smear Survey of Material

Using standard smears ensure a representative survey of all surfaces is taken. Smears should be analyzed using appropriate instrumentation (i.e.: Nucleus 500).

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Note: In evaluating the radioactivity on inaccessible surfaces (e.g.: pipes, drain lines, duct work, etc.) measurements at other applicable access points may be used for evaluating contamination provided the contamination levels at the accessible locations can be demonstrated to be representative of the potential contamination at the inaccessible surfaces. Otherwise, the material should not be released for unrestricted use.

**EASTERN TECHNOLOGIES, INC.  
GENERAL SURVEY GUIDELINES  
FOR  
PROTECTIVE CLOTHING SHIPMENTS  
MOBILE LAUNDRY UNITS**

APPROVED BY:



**MARK FELLOWS  
VICE PRESIDENT**

General Survey Guidelines-PA

I. Purpose

The purpose of this procedure is to detail when surveys of laundry shipments and mobile units are required in addition to describing the extent of required surveys based on proposed work activities.

II. Laundry Shipments

A. Incoming Shipments

1. External Surveys

Incoming shipments of laundry should, at a minimum, be externally surveyed for associated dose rates of the vehicle/external-shipping package (i.e.: trailer, straight truck, etc.). Dose rate surveys should be taken to ensure that the shipment dose rates do not exceed ETI administrative dose limits (e.g.: 50 mr/hr) or applicable DOT dose limits. Smears of the vehicle/external-shipping package (i.e.: trailer, straight truck, etc.) should also be taken to confirm the presence or absence of smearable contamination. Surveys should be performed as soon as practical after a shipment arrives. Vehicles/external shipping packages meeting unrestricted acceptability requirements (e.g.: dose rates  $\leq$  applicable DOT limits, dose rates  $\leq$  50 mr/hr,  $<$  MDA smearable contamination) may be further processed (i.e.: survey of internal shipping containers, placement of external shipping package into laundry facility) for subsequent unloading of containers or material as applicable.

Should associated dose rates exceed ETI administrative limits and/or applicable DOT dose limits, ETI management (i.e.: HP supervisor, plant manager, RSO, etc.) should be contacted immediately and informed of the survey results. ETI management should then determine if a violation of applicable rules (i.e.: DOT, etc.) has occurred and proceed accordingly. Opening of or entry into the vehicle/external-shipping package (i.e.: trailer, straight truck, etc.) is prohibited until permission is received from management. Possible responses include but are not limited to: return of the shipment unopened; remove all containers from trailer, separate with regard to ETI administrative dose limits, reload (unopened) containers that are not acceptable, place acceptable containers inside of facility for processing.

## General Survey Guidelines-PA

Should smearable contamination be found ETI management (i.e.: HP supervisor, plant manger, RSO, etc.) should be contacted immediately and informed of the survey results. ETI management should then determine if a violation of applicable rules (i.e.: DOT, etc.) has occurred and proceed accordingly. Additionally, access to the vehicle/external shipping package and area should be restricted through the use of postings and boundaries. No mitigating action should be undertaken until direction is received from appropriate management (i.e.: HP supervisor, plant manager, RSO, etc.). Possible responses include but are not limited to: determining that the amount of contamination present is below levels, which require further action, decontamination of the external package to acceptable levels of contamination, decontamination of external package to levels of contamination below minimum detectable activity.

Upon completion, applicable survey results should be properly documented and filed for future reference.

### 2. Internal Surveys

#### a. Internal Containers

After completion of the vehicle/external shipping package (i.e.: trailer, straight truck, etc.) survey internal containers of laundry should, at a minimum, be surveyed for associated dose rates and contamination. Contact dose rates should be taken of each container, prior to or during unloading, to ensure that the container dose rates do not exceed ETI administration dose limits (e.g.: 50 mr/hr). Smears of each container should be taken prior to unloading, to confirm the presence or absence of smearable contamination. Containers meeting unrestricted acceptability requirements (e.g.:  $\leq 50$  mr/hr and  $< 1,000$  dpm/100 cm<sup>2</sup> smearable contamination) may be off loaded for processing.

Should an internal container have a dose rate exceeding ETI administrative limits (e.g.: 50 mr/hr) ETI management (i.e.: HP supervisor, plant manager, RSO, etc.) should be contacted and informed of the survey results. If the over

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limit container inhibits unloading of other acceptable containers it may be unloaded, separated, and conspicuously marked so as to identify it. The container may not be opened without permission from appropriate ETI management. Possible responses include but are not limited to: reloading the unopened container on to the shipment vehicle for return to the customer, opening the shipping container, removing internal packages, separate for processing according to ETI administrative dose limits (e.g.:  $\leq 50$  mr/hr), replace unopened over limit internal packages into shipping container for return to the customer.

Should smearable contamination be found on an internal container exceeding 1,000-dpm/100 cm<sup>2</sup> ETI management (i.e.: HP supervisor, plant manager, RSO, etc.) should be contacted and informed of the survey results. Additionally, access to the internal container should be restricted by closing and securing the entry way to the vehicle/external-shipping package. Applicable postings should be utilized as required. The shipping container should not be removed from the transport vehicle until direction is received from appropriate management. Possible responses include but are not limited to: decontamination of the shipping container prior to unloading, unload the shipping container, and place inside laundry facility for decontamination.

Upon completion, applicable survey results should be properly documented and filed for future reference.

Note: For sea/land type container shipments of material contained within numerous individual bags, the survey requirements will be modified to eliminate the requirement for external contamination surveys of each bag. Dose rate surveys of each bag are still required prior to opening the bag for sorting/processing. General area contamination surveys will ensure such action does not create contamination issues.

b. Internal Area

During removal of internal shipping containers or packages

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the internal cargo area of the shipment vehicle (i.e.: trailer, straight truck, etc.) should be surveyed to confirm the presence or absence of contamination. Should the internal cargo area meet ETI unrestricted release criteria (e.g.: smearable contamination < MDA) the shipping containers may be removed.

Should smearable contamination > MDA be found on the floor or walls of the shipment vehicle ETI management should be contacted and informed of the survey results. Additionally, access to the cargo area of the vehicle should be restricted by closing and securing the entry way to the vehicle cargo area. Applicable postings should be utilized as required. Removal of containers or packages is prohibited until permission is received from appropriate management (i.e.: HP supervisor, plant manger, RSO, etc.). Possible responses include but are not limited to: determining that the amount of contamination present dose not pose a concern; decontamination of the cargo area after the shipping containers or packages have been removed.

It should be noted that surveys of the transport path will be required to confirm the presence or absence of contamination after unloading of a contaminated transport vehicle is completed. Proper decontamination practices should be implemented should contamination be found.

Upon completion, applicable survey results should be properly documented and filed for future reference.

### B. Outgoing Shipments

#### 1. Shipping Container Survey

Prior to loading onto transport vehicle, shipping containers should be surveyed for associate dose rates and contamination. Containers meeting ETI unrestricted acceptability requirements (e.g.: < MDA contamination) may be marked and/or labeled as required. Containers not meeting unrestricted acceptability requirements should be repacked and/or decontaminated as required. Containers not meeting unrestricted acceptability requirements should not be loaded for return shipment unless

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management (i.e.: HP supervisor, plant manager, RSO, etc.) permission is obtained on a case-by-case basis. Management will be responsible for determining acceptability of containers not meeting ETI unrestricted release criteria.

Upon completion, applicable survey results should be properly documented and filed for future reference.

### 2. Shipment Vehicle Survey

#### a. Internal Survey

Prior to loading, the cargo area of the vehicle/external-shipping package should be surveyed to confirm the presence or absence of contamination. Should the cargo area meet ETI unrestricted release criteria (e.g.: smearable contamination < MDA) the vehicle may be loaded.

Should smearable contamination be found within the cargo area of the shipment vehicle ETI management should be contacted and informed of the survey results. Possible responses include but are not limited to: determining that the amount of contamination present does not pose concern, decontamination of the cargo area to remove contamination to < MDA.

#### b. External Survey

After loading of the transport vehicle an exterior vehicle survey should be performed to determine associated dose rates and contamination levels. For an outgoing shipment to meet ETI unrestricted acceptability requirements location dose rates (i.e.: drivers compartment, vehicle contact dose rate, dose rate 1 meter, etc.) must be  $\leq$  applicable Department of Transportation maximum allowable dose rates and contamination levels must be < minimum detectable activity.

Shipments not conforming to applicable DOT maximum allowable dose rates are prohibited. Shipments in which the transport vehicle is found to contain external

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contamination  $\geq$  MDA are prohibited unless allowed on a case-by-case basis by management. Management is responsible for determining acceptability of shipments not meeting ETI unrestricted release criteria.

Upon completion, applicable survey results should be properly documented and filed for future reference.

### III. Mobile Laundry Units

#### A. Incoming Shipments

##### 1. External Survey

Incoming mobile unit shipments, at a minimum, be externally surveyed upon arrival or as soon as practical for associated dose rates and contamination. Contact dose rates of the external shipping package (i.e.: trailer) should be taken to ensure compliance with applicable DOT dose limitations. Smears of the external shipping package (i.e.: trailer) should also be taken to confirm the presence or absence of contamination. Mobile units meeting unrestricted acceptability requirements (e.g.: dose rates  $\leq$  applicable DOT limits,  $<$  MDA smearable contamination) may be posted, as applicable, and stored.

Should associated dose rates exceed applicable DOT regulations, management (i.e.: HP supervisor, plant manager, RSO, etc.) should be contacted immediately and informed of the survey results. ETI management should then determine reportability requirements and contact the shipper.

Should smearable contamination be found ETI management should be contacted immediately and informed of the survey results. ETI management should then determine if a violation of applicable (i.e.: DOT, etc.) rules has occurred and proceed accordingly. Possible responses include but are not limited to: determining that the amount of contamination present is below levels which require further action, decontaminating the mobile unit to acceptable levels of contamination, decontaminating the mobile unit to levels of contamination below minimum detectable activity.

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Upon completion, applicable survey results should be properly documented and filed for future reference.

### 2. Internal Survey

Internal surveys of incoming mobile units are not necessary unless entry into the mobile unit is required or such survey is requested by management (i.e.: HP supervisor, plant manager, RSO, etc.) on a case-by-case basis.

Surveys performed to allow inspection of the exposed interior of the mobile unit must, at a minimum, determine area dose rates and contamination levels. Entry into the mobile unit, by persons not involved in the performance of the survey, should not be allowed until radiological conditions within the trailer are known.

Inspection of closed areas or systems potentially containing internal contamination are not allowed unless additional surveys are performed to determine the radiological conditions of the area in question. Protective clothing requirements, if any, will be determined by Health Physics or other appropriate personnel (i.e.: RSO, etc.) based on the results of the survey.

Upon completion, applicable survey results should be properly documented and filed for future reference.

### B. In Storage Mobile Units

#### 1. External Survey

External surveys of in storage mobile units are not required unless circumstances exist in which the incoming survey results are no longer valid or accurate.

External surveys of in storage mobile units may be required by management on a case-by-case basis. If required, the survey should determine locational dose rates (i.e.: contact, 1 meter, 2 meters, etc.) and contamination levels.

Upon completion, applicable survey results should be properly documented and filed for future reference.

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### 2. Internal Survey

Internal surveys of in storage mobile units are not required unless entry is required for inspection or maintenance.

Surveys performed to allow inspection of the exposed interior of the mobile unit must, at a minimum, determine area dose rates and contamination levels. Entry into the mobile unit, by persons not involved in the performance of the survey, should not be allowed until radiological conditions within the trailer are known.

Protective clothing requirements, if any, will be determined by Health Physics or other appropriate personnel (i.e.: RSO, etc.) based on the results of the survey.

Survey's performed to allow maintenance on areas or systems within the mobile unit must, at a minimum, determine general area dose rates, individual equipment or work area dose rates, general area contamination. Protective clothing requirements will be determined by Health Physics or other appropriate personnel (i.e.: RSO, etc.) based on survey results. Additionally, closed systems within the trailer must be considered contaminated unless suitable survey methods determine otherwise.

Closed systems not properly surveyed prior to opening, should be surveyed as soon as practical after breach so radiological conditions can be determined. Health Physics or other appropriate personnel will determine revised protective clothing requirements based on survey results. Additional surveys of the general and individual work areas should be performed periodically to determine current radiological conditions. Protective clothing requirements may be modified based on survey results.

Upon completion, applicable survey results should be properly documented and filed for future reference.

### C. Outgoing Shipments

#### 1. Internal Survey

Prior to shipment internal area and equipment within mobile units must be surveyed to determine associated dose rates and contamination levels. Mobile units meeting ETI unrestricted

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release criteria (e.g.:  $\leq 10$  mr/hr,  $\leq$  MDA smearable contamination) may be prepared for shipment.

Should radiological conditions exceed ETI unrestricted release criteria, management (i.e.: HP supervisor, plant manager, RSO, etc.) should be contacted and informed of the survey results. Management will be responsible for determining acceptability of the shipment or implementing mitigating actions.

### 2. External Survey

After completion of internal survey and prior to shipment an external survey of the mobile units should be performed to determine associated dose rates and contamination levels. For an out going mobile unit to meet ETI unrestricted acceptability requirements locational dose rates (i.e.: drivers compartment, vehicle contact dose rate, dose rate at 1 meter, etc.) must be  $\leq$  applicable Department of Transportation maximum allowable dose rates and contamination levels must be  $<$  minimum detectable activity.

Shipments not conforming to applicable DOT maximum allowable dose rates are prohibited. Shipments in which the transport vehicle is found to contain external contamination  $\geq$  applicable Department of Transportation maximum allowable dose rates and contamination levels must be  $<$  minimum detectable activity.

Shipments not conforming to applicable DOT maximum allowable dose rates are prohibited. Shipments in which the transport vehicle is found to contain external contamination  $\geq$  MDA are prohibited unless allowed on a case-by-case basis by management. Management is responsible for determining acceptability of the shipment with regard to applicable (i.e.: DOT, etc.) regulations.

Upon completion, applicable survey results should be properly documented and filed for future reference.

November 4, 2002

Eastern Technologies, Inc.

Berwick Service Center

Laundry Process Control/Quality Control Procedure

Approved By:



Mark Fellows  
Vice President  
Eastern Technologies, Inc.

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## 1.0 Purpose

In order to produce a consistent top quality product and to ensure compliance with customer quality and re-use standards written procedures covering each phase of processing should be produced, implemented and adhered to.

## 2.0 Scope

This procedure describes the method by which protective clothing (P.C.'s), non-apparel items and respiratory protection devices will be handled during processing at ETI's Berwick Service Center. Personnel involved in the processing of these items will follow these procedures and guidelines unless specifically amended in attachments.

## 3.0 Processing Procedure for Protective Clothing

### 3.1 Sorting

Prior to initial sorting of protective clothing belonging to a specific customer ensure that sorting area, sorting tables, reusable containers and reusable transfer devices are cleaned in accordance with Section 7.0 of this procedure to remove loose contamination that may be present from another source (i.e.: prior customer). Unless otherwise directed by HP or the Plant Manager, sorting of unprocessed (unwashed) protective clothing should only be performed utilizing operating sorting equipment. Protective wear items should be separated by type (i.e.: rubber gloves, rubber shoes, coveralls, etc.) and does rate (e.g.:  $\leq 1$  mr/hr,  $\geq 1$  mr/hr but  $\leq 5$  mr/hr,  $> 5$  mr/hr) and placed into reusable transfer devices (i.e.: carts, automated slings, etc.). Non-launderable items and/or trash are to be removed and placed into a receptacle for return to the customer.

### 3.2 Unprocessed (unwashed) Item Transfer

Prior to initial use of reusable transfer equipment (i.e.: carts, automated slings, etc.) to transfer items belonging to a specific customer ensure that it has been cleaned in accordance with Section 7.0 of this procedure to remove loose contamination that may be present from another source (i.e.: prior customer). Unless otherwise directed by HP or the Plant Manager reusable transfer devices are to be used to transfer sorted items from the sorting area to the washing machines.

### 3.3 Washing

Prior to initial placement of a specific customer's protective clothing into the washing machine ensure that the washing machine has been cleaned in accordance with Section 7.0 of this procedure to remove any loose contamination that may be present from another source (i.e.: prior customer).

If the washing machine has been cleaned in accordance with Section 7.0 of this procedure then it may be loaded and operated with the proper type and amount of protective clothing. Over loading of equipment is not allowed in any circumstances due to possible equipment damage and the high probability of a reduction in product quality. Under loading of equipment is acceptable if circumstances warrant such action. Proper cycles for the particular protective item should be used to process protective items (i.e.: cotton coveralls, rubber gloves, rubber shoes, etc.). Refer to available cycle list for proper cycle number.

#### 3.4 Washed Item Transfer

Prior to initial use of washed item transfer equipment (i.e.: reusable carts, automated shuttle system) to transfer protective clothing of a particular customer from the washers to the dryers ensure that it has been cleaned in accordance with Section 7.0 of this procedure to remove loose contamination that may be present from another source (i.e.: prior customer). If the equipment has been cleaned in accordance with Section 7.0 of this procedure, it may be used for the transfer of washed protective clothing items. Unless otherwise directed by HP or the Plant Manager, reusable equipment (i.e.: reusable carts, automated shuttle system) should be used for the transfer of protective clothing from washers to dryers.

#### 3.5 Drying Protective Clothing

Prior to initial placement of a specific customer's protective clothing into a dryer ensure that it has been cleaned in accordance with Section 7.0 of this procedure to remove any loose contamination that may be present from another source (i.e.: prior customer). If the dryer has been cleaned in accordance with Section 7.0 of this procedure then the dryer may be loaded with the proper type and amount of protective clothing. Over loading of equipment is not allowed in any circumstances due to possible equipment damage and the high probability of a reduction in product quality. Under loading of equipment is acceptable if circumstances warrant such action. Proper cycles for the particular type and amount (i.e.: cotton coverall full load, cotton coverall partial load, etc.) of protective items should be used. Temperatures exceeding protective item

manufacturer's specifications (if available) should not be used under any circumstances due to possible product damage and the high probability of reduction in product quality. Refer to available cycle list for proper cycle numbers.

### 3.6 Dried Item Transfer

Prior to initial use of dried item transfer equipment for a specific customer's items ensure that it has been cleaned in accordance with Section 7.0 of this procedure to remove any loose contamination that may be present from another source (i.e.: prior customer). If the dried item transfer equipment has been cleaned in accordance with Section 7.0 of this procedure it may be used to transfer the dried protective items to the monitoring area.

### 3.7 Monitoring of Protective Clothing Items

Prior to initial placement of a specific customer's protective clothing items onto ETI's automated monitoring equipment, ensure that equipment has been cleaned in accordance with Section 7.0 of this procedure to remove any loose contamination that may be present from another source (i.e.: prior customer). Preoperational checks and active monitoring should be performed in accordance with applicable procedures except as noted in attachments. Items that are not completely dry should be returned to the dryer for reprocessing before monitoring. Items, which fail to clear the monitor, should be marked for rewash and returned to the laundry for reprocessing. Items, which fail to clear the monitor after on rewash, shall be separated and marked appropriately for return shipment to the customer.

**Note:** Any rewash items saved for additional processing or that will not be returned in the processing lot in which they were included should be placed in proper containers and marked with the appropriate information which at a minimum shall include the customer's name and the fact that the items are held for additional processing.

Items, which clear the monitor, are acceptable for further processing. Alarm set points and other specific monitoring requirements set forth by each customer shall be utilized to determine acceptability of items.

**Note:** Items that have a high potential for damaging automated monitoring equipment shall not be placed into equipment unless

directed by shift supervisor. This shall also include items wider than 6' or longer than 10'.

#### 4.0 Processing procedure for Non-Apparel Items

##### 4.1 Sorting

Prior to initial sorting of non-apparel items belonging to a specific customer ensure that sorting area, sorting equipment, reusable containers and reusable transfer devices are cleaned in accordance with Section 7.0 of this procedure to remove any loose contamination that may be present from another source (i.e.: prior customer). Unless other wise directed by HP or the Plant Manager, sorting of unprocessed (unwashed) non-apparel items should only be performed in operating sorting equipment. Non-apparel items should be separated by type (i.e.: rags, towels, slings, etc.) and dose rate (e.g.:  $\leq 1$  mr/hr,  $\geq 1$  mr/hr but  $\leq 5$  mr/hr,  $> 5$  mr/hr) and placed into reusable transfer devices (i.e.: carts, automated slings, etc.). Non-launderable items and/or trash are to be removed and placed into a receptacle for return to the customer.

##### 4.2 Unprocessed (unwashed) Item Transfer

Prior to initial use of reusable transfer equipment (i.e.: carts, automated slings, etc.) to transfer items belonging to a specific customer ensure that it has been cleaned in accordance with Section 7.0 of this procedure to remove any loose contamination what may be present from another source (i.e.: prior customer). Unless otherwise directed by HP or the Plant Manger reusable transfer devices are to be used to transfer sorted items from the sorting area to the washing machines.

##### 4.3 Washing

Prior to initial placement of a specific customer's non-apparel items into the washing machine ensure that the washing machine has been cleaned in accordance with Section 7.0 of this procedure to remove any loose contamination that may be present from another source (i.e.: prior customer). If the washing machine has been cleaned in accordance with Section 7.0 of this procedure then the machine may be loaded and operated with the proper type and amount of non-apparel items. Over loading of equipment is not allowed in any circumstances due to possible equipment damage and the high probability of a reduction in product quality. Under loading of equipment is acceptable if circumstances warrant such action. Proper cycles for the particular non-apparel items

should be used to process non-apparel items (i.e.: rags, towels, slings, etc.). Refer to available cycle list for proper cycle number.

#### 4.4 Washed Item Transfer

Prior to initial use of washed item transfer equipment (i.e.: reusable carts, automated shuttle system) to transfer non-apparel items of a specific customer from the washers to the dryers ensure that it has been cleaned in accordance with Section 7.0 of this procedure to remove any loose contamination that may be present from another source (i.e.: prior customers). If the equipment has been cleaned in accordance with Section 7.0 of this procedure it may be used for the transfer of washed non-apparel items. Unless otherwise directed by HP of the Plant Manager reusable equipment (i.e.: reusable carts, automated shuttle system) should be used for the transfer of non-apparel items from washers to dryers.

#### 4.5 Drying Non-Apparel Items

Prior to initial placement of a specific customer non-apparel items into a dryer ensure that it has been cleaned in accordance with Section 7.0 of this procedure to remove any loose contamination that may be present from another source (i.e.: prior customer). If the dryer has been cleaned in accordance with Section 7.0 of this procedure then the dryer may be loaded with the proper type and amount of non-apparel items. Over loading of equipment is not allowed in any circumstances due to possible equipment damage and the high probability of a reduction in product quality. Under loading of equipment is acceptable if circumstances warrant such action. Proper cycles for the particular type and amount (i.e.: rags full load, rags partial load, etc.) of non-apparel item should be used. Temperatures exceeding non-apparel item manufacture's specifications (if available) should not be used under any circumstances due to possible product damage and the high probability of a reduction in product quality. Refer to available cycle list for proper cycle number.

#### 4.6 Dried Item Transfer

Prior to initial use of dried item transfer equipment for a specific customer's items ensure that it has been cleaned in accordance with Section 7.0 of this procedure to remove any loose contamination that may be present from another source (i.e.: prior customer). If the dried item transfer equipment has been cleaned in accordance with Section 7.0 of this procedure it may be used to transfer the dried non-apparel items to the monitoring area.

#### 4.7 Monitoring of Non-Apparel Items

Prior to initial placement of a specific customer's non-apparel items onto ETI's automated monitoring equipment, ensure that equipment has been cleaned in accordance with Section 7.0 of this procedure to remove any loose contamination that may be present from another source (i.e.: prior customer). Preoperational checks and active monitoring should be performed in accordance with applicable procedures except as noted in Attachments. Items that are not completely dry should be returned to the dryer for reprocessing before monitoring. Items, which fail to clear the monitor, should be marked for rewash and returned to the laundry for reprocessing. Items, which fail to clear the monitor after one rewash, shall be separated and marked appropriately for return shipment to the customer.

**Note:** Any rewash items saved for additional processing or that will not be returned in the processing lot in which they were included should be placed in proper containers and marked with the appropriate information which at a minimum shall include the customer's name and the fact that the items are held for additional processing.

Items, which clear the monitor, are acceptable for further processing. Alarm set points and other specific monitoring requirements may be reviewed in Attachments.

**Note:** Items that have a high potential for damaging automated monitoring equipment shall not be placed into equipment unless directed by shift supervisor. This shall also include items wider than 6' or longer than 10'.

#### 5.0 Processing Procedure for Identified "Hot Particle" Items

Processing of "Hot Particle" items will be as discussed in applicable sections of this procedure (e.g.: Section 3.0 and Section 4.0) but with the following restrictions added.

- 5.1 Only "Hot Particle" items will be allowed in processing areas and equipment while "Hot Particle" items are being processed.
- 5.2 All equipment and areas should be cleaned in accordance with Section 7.0 of this procedure manual before introduction of non-"Hot Particle" items

will be allowed into processing areas and/or equipment.

- 5.3 Surveys of processing areas and equipment should be performed after decontamination to ensure success of decontamination efforts. If surveys detect residual hot particle contamination, decontamination of effected areas should be performed until cleared.

#### 6.0 Processing Procedure for Respiratory Protection Devices

- Notes: 1. Ensure respiratory device cleaning equipment and area have been cleaned in accordance with Section 7.0 of this procedure before items are placed into processing room.
2. At no time will potentially contaminated items from other sources (i.e.: other customers) be allowed in processing equipment or room while it is being used to clean inprocess items.

- 6.1 Remove filter or breathing tube from the respirator.
- 6.2 Remove plastic lens cover (if present) from the respirator.
- 6.3 Remove exhalation valve cover from respirator.
- 6.4 Extend respirator head bands out to their fullest.
- 6.5 Mix, according to vendor specifications, cleaning/sanitizing solution. Rinse solution consisting of 5% chlorine (2.5 oz. per 20 gallons of water).

Note: Temperature of the wash water shall be a least 100° Fahrenheit and shall not exceed 120° Fahrenheit.

- 6.6 Periodically during the cleaning/sanitizing process, insure temperature of the wash water remains in the acceptable limits by the use of a temperature-measuring device.
- 6.7 Clean face piece and breathing tubes in cleaner/sanitizer solution by using a light scrubbing action (i.e.: Use a soft bristle brush).
- 6.7.1 Ensure breathing tubes are joined together to prevent wash solution from getting inside the breathing tubes.
- 6.7.2 SCBA tubes will be taped to prevent solution from entering because ends will not physically fit together. Tubes will be wiped

down with cleaning solution if possibility of getting water inside tubes exists.

- 6.8 Wash exhalation covers by following steps (6.6, 6.7.1, 6.7.2).
- 6.9 Clean metal adapters and regulators by using spray cleaner and cleaning towels on the exterior surfaces.
- 6.10 Rubber, elastic, and webbing parts such as harnesses and belts will be cleaned per step (6.6, 6.7, 6.7.1, 6.7.2).
- 6.11 Thoroughly rinse face pieces, hose, cover, belts, etc., in warm water and hand on pegboard to allow excess water to drip off before being placed into drying cabinet.  
  
Note: Temperature of rinse water will be a least 110° Fahrenheit and shall not exceed 120° Fahrenheit.
- 6.12 Place respirator equipment in drying cabinet for complete air-drying.  
  
Note: Temperature of air used to dry respirators shall not exceed 120° Fahrenheit.
- 6.13 After complete drying of respiratory equipment items will be monitored for residual contamination in accordance with customer respiratory protection devices monitoring requirements.
- 6.14 Respiratory equipment meeting the reuse specifications of 6.13 will be packaged and appropriately marked for return shipment to the customer.
- 6.15 Respiratory equipment not meeting the reuse specifications of 6.13 will be separated and returned to processing area for rewash.
- 6.16 Respiratory equipment not meeting the reuse specification of 6.13 after one rewash will be packaged marked and returned to customer.

7.0 Decontamination and Clean Up of Processing Equipment and Areas (Normal/Hot Particle)

The following procedure should be adhered to unless otherwise directed by HP or the Plant Manager.

7.1 Decontamination of Sorting Area

Before introduction of customer material into sorting area, floor and accessible wall areas should be cleaned to eliminate chance of cross contamination from a prior customer. Floor areas should be washed and/or mopped to remove any loose contamination that may exist.

- Notes: 1. Accessible wall areas are any areas in which customer's items might come in contact with wall during normal processing.
2. Sorting area may continue to be used, after initial decontamination, for a particular customers items until all items have been processed through the sorting area. Normal housekeeping measures continue to apply at all times.

#### 7.2 Decontamination of Sorting Equipment

Before introduction of a customer's material into sorting equipment it should be cleaned to eliminate chance of cross contamination from a prior customer.

Note: Sorting equipment may continue to be used, after initial decontamination, for particular customers items until all items have been processed thru the sorting table. Normal housekeeping measures continue to apply at all times.

#### 7.3 Decontamination of Reusable Unprocessed Items Transfer Equipment

Before introduction of a customer material into a reusable unprocessed item transfer device (i.e.: cart, sling) the device should be cleaned to eliminate chance of cross contamination from a prior customer. Carts and buggies should be wiped and/or washed down internally and externally to remove any loose contamination that may exist. Slings should be washed to remove any loose contamination that may exist.

Note: Transfer devices may continue to be used, after initial decontamination, for a particular customers item until all items have been transferred. Normal housekeeping measures continue to apply at all times.

#### 7.4 Decontamination of Washers

Before introduction of a customers items into a washer the washer should

be cleaned to eliminate any chance of cross contamination from a prior customer. All accessible areas (Note 1) of the washing machine should be wiped and/or washed down to remove any loose contamination that may exist. Particular attention is to be paid to the front and interior of the machine. A visual inspection of the interior of the machine is required to ensure that no trash and/or debris (i.e.: strings, lint, tape, etc.) is present. Any debris noticed during this inspection should be removed before cleaning of the internal areas of the machine. Internal areas of the machine may be cleansed by running an empty, clean water wash cycle.

- Notes: 1. Accessible areas shall be any area in which customer items might come in contact with surfaces of the washing machine during normal processing.
2. Washing machine may continue to be used, after initial decontamination, to process a particular customer' items until all items have been processed. Customer requirements more stringent than those covered in this section may be reviewed in attachments to this procedure. Normal housekeeping measures continue to apply at all times.

#### 7.5 Decontamination of Washed Item Transfer Equipment

Before introduction of a customers material into washed item transfer device (i.e.: carts, buggies, automated shuttle system) the device should be cleaned to eliminate chance of cross contamination from a prior customer. Carts and buggies should be wiped and/or washed down internally and externally to remove any loose contamination that may exist. Accessible areas (Note 1) of the automated shuttle system should also be washed and/or wiped down to remove any loose contamination that may exist. Particular attention should be paid to the transfer belt and retention walls of the shuttle. Transfer belt should be cleaned along its entire length. Repositioning of the belt to allow complete cleaning can be accomplished by jogging the belt with the appropriate switch.

- Notes: 1. Accessible areas shall be any area in which customers' items may come in contact with equipment during normal processing.
2. Transfer equipment may continue to be used, after initial decontamination, for a particular customer items until all

items have been transferred. Normal housekeeping measures continue to apply at all times.

**7.6 Decontamination of Dryers**

Before introduction of customers' items into a dryer it should be cleaned to eliminate chance of cross contamination from a prior customer. Exterior portions of the dryer that may come into contact with customer items during normal processing should be wiped down to remove any loose contamination that may exist from a prior customer.

Note: Dryer may continue to be used, after initial decontamination, to process customer items until all items have been processed.

**7.7 Decontamination of Dried Item Transfer Equipment**

Before introduction of a customer's material into dried item transfer devices (i.e.: carts, buggies) the device should be cleaned to eliminate any chance of cross contamination from a prior customer.

Carts and buggies should be wiped and/or washed down internally and externally to remove any loose contamination that may exist.

- Notes: 1. Dried item transfer devices may continue to be used, after initial decontamination, to process customer items until all items have been processed.
2. Normal housekeeping measures continue to apply at all times.

**7.8 Decontamination of Automated Monitoring Equipment**

Before introduction of customer items into automated monitoring equipment it should be cleaned to eliminate any chance of cross contamination from a prior customer. All accessible areas (Note 1) of the machine should be wiped down and/or vacuumed to remove any loose contamination that may exist. Particular attention should be paid to the chain belt and support bed. All debris (i.e.: lint, string, etc.) should be removed from accessible areas.

- Notes: 1. Accessible areas shall be any area where customer items may come in contact with equipment during normal operation.

2. Automated monitoring equipment may continue to be used, after initial decontamination, to process customer items until all items have been processed.
3. Normal housekeeping measures continue to apply at all times.

#### 7.9 Decontamination of Respiratory Device Cleaning Area

Before introduction of customer material into respiratory device cleaning area accessible (Note 1) floor and wall areas should be cleaned to eliminate any chance of cross contamination from a prior customer. Accessible floor areas should be washed down and/or mopped to remove any loose contamination that may exist. Accessible wall areas should be washed and/or wiped down to remove any loose contamination that may exist.

- Notes:
1. Accessible areas are any areas in which customers might come in contact during normal processing.
  2. Area may continue to be used, after initial decontamination, for a particular customer items until all items have been processed. Normal housekeeping measures continue to apply at all times.

#### 7.10 Decontamination of Respiratory Device Cleaning and Drying Equipment

Before introduction of customer material into respiratory device cleaning and drying equipment, the equipment should be cleaned to eliminate any chance of cross contamination from a prior customer. Internal and external areas of sinks used to clean respiratory devices should be washed and/or wiped down to remove any loose contamination that may exist. Internal and external areas of drying cabinets used to dry respiratory devices should be washed and/or wiped down to remove any loose contamination that may exist.

Note: Equipment may continue to be used, after initial decontamination, for a particular customers item until all items have been processed. Normal house keeping measures continue to apply at all times.

This is to acknowledge the receipt of your letter/application dated

1/29/2004, and to inform you that the initial processing which includes an administrative review has been performed.

**NEW LICENSE APPLICATION (03036499)**  
There were no administrative omissions. Your application was assigned to a technical reviewer. Please note that the technical review may identify additional omissions or require additional information.

Please provide to this office within 30 days of your receipt of this card

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A copy of your action has been forwarded to our License Fee & Accounts Receivable Branch, who will contact you separately if there is a fee issue involved.

Your action has been assigned Mail Control Number 134442.  
When calling to inquire about this action, please refer to this control number.  
You may call us on (610) 337-5398, or 337-5260.

NRC FORM 532 (R)  
(6-96)

Sincerely,  
Licensing Assistance Team Leader

BETWEEN: License Fee Management Branch, ARM and Regional Licensing Sections

: (FOR LFMS USE)  
: INFORMATION FROM LTS  
: -----  
:  
: Program Code: 03218  
: Status Code: 3  
: Fee Category: \_\_\_\_\_  
: Exp. Date: 0  
: Fee Comments: \_\_\_\_\_  
: Decom Fin Assur Reqd: \_  
: ::

LICENSE FEE TRANSMITTAL

A. REGION I

1. APPLICATION ATTACHED  
 Applicant/Licensee: EASTERN TECHNOLOGIES, INC.  
 Received Date: 20040203  
 Docket No: 3036499  
 Control No.: 134442  
 License No.: 01-30362-01  
 Action Type: New License

2. FEE ATTACHED  
 Amount: \$12,600.00  
 Check No.: 13599

3. COMMENTS  
 Signed M. A. Perkins  
 Date 2/4/04

B. LICENSE FEE MANAGEMENT BRANCH (Check when milestone 03 is entered /\_\_\_/)

1. Fee Category and Amount: \_\_\_\_\_  
 2. Correct Fee Paid. Application may be processed for:  
 Amendment \_\_\_\_\_  
 Renewal \_\_\_\_\_  
 License \_\_\_\_\_  
 3. OTHER \_\_\_\_\_

Signed \_\_\_\_\_  
 Date \_\_\_\_\_