APPENDIX A

PEACH BOTTOM NUCLEAR POWER STATION

TEMPORARY WASTE HANDLING BUILDING

RADIOLOGICAL SPECIFICATIONS/EVALUATIONS

GENERAL ELECTRIC COMPANY

APRIL 1984

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1.0 Background

The Philadelphia Electric Power Company (PECo) will be replacing in 1984 the recirculation piping at its Peach Bottom Unit 2 Nuclear Power Station. The piping will be initially decontaminated and cut into selected lengths in the drywell and then transported to a Waste Handling Building for further cleanup and shipment offsite. A Butler Building has been tentatively selected by PECo to be erected and to serve as the Waste Handling Building. The Building will be mounted on a pre-existing concrete slab and will have a 4 inch lip to contain potentially contaminated liquid in the event of a spill.

The Waste Handling Building will be used to perform the following tasks:

1) Cutting pipe into appropriate lengths.

2) Pipe Decontamination.

3) Obtaining samples of pipe materials and welds for materials analyses.

4) Package and shipment of piping to an off site facility.

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Based on prior measurements of the recirculation piping by the General Electric Company, the predicted contamination levels inside the pipe, for the most significant isotopes, at the time of shutdown are:

Co-60	-	90 curies
Zn-65	-	30 curies
Co-58	-	10 curies
Mn-54	-	2 curies
Total	-	132 curies

Since pipe decontamination will occur prior to cutting into sections for transport to the Waste Handling Building, the probable DF will be in the range of 5 to 30. For the purpose of evaluating the potential radiological consequences associated with operating the Waste Handling Building a DF of 5 is conservatively assumed. Therefore, the total activity in the removed piping is assumed to be approximately 25 curies.

To determine the potential consequences of operating the Waste Handling Building the General Electric Company has been requested by PECo to provide the following:

1) The criteria applicable to radiological control of the piping and contained activity from the time it is brought into the Waste Handling Building until it is packaged and removed from the Building, and

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2) An assessment of the building and operations conducted therein as they affect 10CFR50.59.

2.0 Radiological Control Criteria

2.1 Contamination Control

To minimize potential exposure to operating personnel and to the general population the following containment/filtration barriers shall be incorporated into the design of the Waste Handling Building:

2.1.1 Containment Barriers

2.1.1.1 Primary Containment

A primary containment barrier shall be provided which encloses the general work area and secondary barriers and shall be maintained at a negative pressure to insure containment air is filtered prior to release to the environment. Air flow shall be from less contaminated to more contaminated areas. Since the structure to be provided at Peach Bottom is separate from the rest of the plant, provisions for personnel decontamination, i.e. showers, wash room, etc. shall be provided if employees working in this facility can go directly into other plant areas which are expected to be at lower levels of contamination.

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To minimize the potential for airborne contaminants it is recommended that electrical interlocks be provided to insure that whenever the primary containment's exhaust filter system is not operating:

1) The vehicle entry door shall not be opened.

2) Power to the Plasma Arc Cutting, Decontamination and Grinding/Flapping stations shall be discontinued.

Administrative override of the above interlocks is acceptable if contamination/airborne activity levels are within the guidelines established by the station's Health Physics staff.

2.1.1.2 Secondary Containment

To minimize airborne activity levels within the Waste Handling Building secondary containment capability should be provided for those work tasks which can result in the generation of airborne materials, i.e. plasma arc cutting, flapping, grinding, etc. The type of secondary containment to be provided will be dependent upon the tasks being performed. For example, for grinding or flapping inside a pipe or for plasma arc cutting, it may be possible to apply a suction blower on the downstream end of the pipe and insure flow is thru the pipe to the blower to the primary containment's exhaust system. For those tasks which involve decontaminating the exterior surface, it may be necessary to perform the

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decontamination inside another enclosure which is exhausted directly to the primary containment's exhaust system.

A lay out of the work stations and equipment in the waste building should be made. The layout should be checked for adequate space to accomplish the work tasks expected. Work space should include space to move and maneuver the pieces to be worked on, space for cutting and decontamination and space for the boxing of parts to be shipped.

All work stations within the building should be evaluated for direct radiation from the radioactive pipes and components in the building at any given time. This should include cutting or decontamination work in progress, material already boxed, any filters or accumulations of activity removed from the pipes.

Since the projected dose rate from a 12 ft. length of 28 inch diameter pipe is 50 mr/hr much of the building may exceed 5 mr/hr from direct shine. Shielding should therefore be considered around the work pieces or within particular work areas.

Storage of accumulated waste should be minimized and piping ready for shipment should be stored outside of the building in a roped off area with hazardous material warning signs.

Liquids used for decontaminating purposes shall be limited to less than that volume which the structure can contain (i.e. $\sim$ 1300 gallons).

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2.2. Ventilation Requirements

The purpose of the ventilation system, when used as necessary with secondary containment systems, is to provide a general work environment which meets the limits of 10CFR Part 20 relative to airborne contaminants and to ensure adequate treatment of exhaust air to meet the plant technical specifications. To meet these objectives the exhaust system should be run at all times unless health physics measurements can guarantee that onsite and offsite limits are met with the system turned off.

2.2.1 Negative Pressure Differential

To be reasonably assured that any activity which becomes airborne in the primary containment is filtered prior to release to the environment, the exhaust ventilation/ filtration system shall be capable of maintaining at least a 1/4" water gauge negative pressure inside the containment with respect to atmospheric conditions outside the containment.

The exhaust system shall also incorporate the capability for monitoring the air flow through and the pressure drop across the exhaust filter. The pressure drop measurement will be indicative of filter plugging or filter bypass while the flow measurement will be an indication of the ability to maintain a negative pressure in the containment.

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2.2.2 Air Flow

As noted previously to minimize contamination, the flow of air within the Waste Handling Building should be from areas of expected low contamination to areas of potentially higher contamination. The design of the exhaust system must also take into consideration the potential sources of input. For example, if a positive displacement blower is used at one of the work stations to remove air from the work station and if it exhausts directly into the primary containment's exhaust system, the containment's exhaust system must be designed such that the work station's exhaust blower does not result in forcing contaminated air from the containment's exhaust system back into the containment.

2.2.3 Filter Requirements

Since the potential exists for releasing radioactive materials to the environment as a consequence of cutting/decontamination, it is necessary that HEPA (High Efficiency Particulate Air) filters be installed in the primary containment's exhaust system. These filters shall be installed downstream of the last input to the exhaust system and should be installed far enough downstream to insure homogeneous mixing within the ductwork prior to the filters. Penetrations shall be installed upstream and downstream of the filters at a location sufficient to insure homogeneous flow within the duct and the ability to collect an isokinetic sample for determining overall filter efficiency and activity release rate to the environment. The efficiency of the HEPA filters and installed filter housing shall be demonstrated under rated flow conditions to be at least 99.9% for particles of 0.3 microns in size.

While it is not expected that the HEPA filters will be subjected to significant levels of airborne contaminants, consideration should be given to eventual filter replacement and disposal. Filter design should therefore take into consideration such items as need for temporary shielding, ability to easily handle contaminated filter/housing, disposal requirements, projected man rem exposure, etc.

Depending upon expected dust conditions existing at the site, it may be advisable to install HEPA filters on the inlet duct to reduce the possible need to replace a potentially contaminated exhaust filter due to dust loading.

Consideration should also be given to the need to install auxiliary filtration at some of the work stations to prevent loading the exhaust filters prematurely. For example if the plasma arc could result in significant generation of particulate aerosols, it may be desirable to install a small HEPA filter between the work area and the plant exhaust duct which can be easily changed.

2.2.4 Containment Cooling

Since the projected time schedule for performing the work tasks required to ship the piping off-site is the latter part of June to the first part of August and since the Waste Handling Building will have to remain closed, except when piping is transported in or out, it is recommended that an air treatment system be installed to cool the interior air. The capacity and type of air treatment system to be installed is not within the scope of this specification.

3.0 Health Physics/Radiation Monitoring Requirements

3.1 Health Physics Monitoring Requirements

The plant health physics staff shall develop and implement a routine schedule for dose rate and surface contamination surveys, bioassay and air sampling in the facility. These surveys and approval for the work tasks to be conducted within the Waste Handling Building shall take into consideration the ALARA program implemented for the site.

Since it may be necessary to wear protective clothing and periodically respiratory protection equipment, procedures for the use of these articles should be the same as those established for the site.

3.2 Radiation Monitoring Requirements

To assist in maintaining onsite and offsite exposures ALARA, radiation monitoring capability shall be installed in the primary

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containment's exhaust ventilation system and inside the containment.

3.2.1 Exhaust Ventilation Monitoring

The ventilation exhaust downstream of the HEPA filter shall be continuously monitored for the release of particulate activity. This release, when considered in combination with other plant pathways, shall not result in the plant technical specifications being exceeded. While the methods of performing the monitoring function is not within the scope of this document the following may be of use in designing the required sample system.

1) An isokinetic probe should be located downstream from the HEPA filters a minimum distance of five diameters (preferably ten) for a circular duct or five times (preferably ten) the major dimension for a rectangular duct. The probe should be free of abrupt changes in flow direction or prominent duct transitions.

   The length of sample line from the isokinetic probe to the particulate monitor/sampler should be minimized to reduce both plateout and response time.

2) The isokinetic probe should be oriented so that sample gases will enter the probe tip in the same direction as the ventilation exhaust gas flow and at the same velocity as the adjacent gas. The probe and the ventilation exhaust duct

should be designed to provide access to the probe for servicing and removal.

If an on line radiation monitor is provided, the system should have high and low level radiation alarms. The high level alarm should be used to isolate the power to the HEPA exhaust fan motors.

Unless otherwise specified, the sampling/monitoring system should be suitably protected to envelope an environment from 0 to 60°C and 20 to 98% relative humidity.

3) The monitor should be responsive to gamma and beta radiation over an energy range of 80 Kev to 3 Mev. The energy dependence should not exceed ± 20 percent of point over the entire range.

The sample line from the probe should be: (a) leak tight, (b) made of stainless steel, and (c) free of dips or other areas where condensation may collect.

4) A flow rate measuring device should be used so that the sample flow rate may be fixed and known. The sample flow rate should be adjustable from 3 cubic feet per minute to 10 cubic feet per minute at 70°F and at one atmosphere.

5) The air flow through the monitor should be accurate to within ±20 percent of full scale.

6) The filter paper used should be capable of retaining 90 percent of all particles of 0.3 microns or greater.

7) The relationship between the flow in the sampling line and the total flow from the ventilation exhaust should be accurately known. A low flow in the sampling line should activate an alarm.

8) The sampling line, at the point of monitoring, and the detector assembly, if an on line detector is provided, should be sufficiently shielded to reduce the background radiation to a point where the minimum detectable concentration can be obtained.

3.2.2 Containment Radiation Monitor

A continuous air monitor shall be located within the facility to monitor airborne activity. The monitor(s) should be placed to provide personnel with warning from airborne activity levels exceeding the guidelines of 10CFR20. The monitor(s) shall meet the same requirements as the ventilation effluent monitor except for the isokinetic probe.

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4.0 Facility Preparation

The following guidance is provided to reduce the potential for airborne and surface contamination, to minimize worker exposure and to aid in decontamination of the facility once it has served its intended function.

4.1 Floor Covering

Since a normal concrete surface is fairly porous and rough it is recommended that the concrete base mat be sealed and a floor tiling capable of withstanding the expected load and traffic be installed. A preferable floor covering would be one which is continuous and employs the widest width possible. Care should be taken to insure the seams and end pieces are securely glued to the concrete.

4.2 Painting

To also aid in surface decontamination it is recommended that the interior surface of the Waste Handling Building be painted with a paint capable of withstanding typical surface decontamination solutions. Care should be taken to properly seal crevices and joints prior to painting.

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5.0 Radiological Evaluation

5.1 Normal Operation

As a consequence of operating the Waste Handling Building, the possibility exists that some of the activity contained on the disassembled piping will become airborne and be released to the general environment. The potential offsite consequences from such a release have been calculated based on the following assumptions:

1) Consistent with the FSAR the site boundary average annual X/Q for a ground level release is 1.1×10^{-5} sec/m^3.

2) 1% of the activity contained on the piping is released to the exhaust filters which have a filter efficiency of 99%.

The above assumptions result in the following integrated offsite concentrations. These values are compared with those from 10CFR20.

Isotope	Act. Rel. to Envir. (Ci)	Calc. Site Boundary Act. Lvl. (Ci-sec/m^3-yr)	Calc. 10CFR20 Act. Lvl. (Ci-sec/m^3-yr)
Mn 54	4.0-5	4.4-10	3.2-2 a)
Co 58	2.0-4	2.2-9	6.3-2
Co 60	1.8-3	2.0-8	9.5-3
Zn 65	6.0-4	6.6-9	6.3-2

a) 3.2-2 = 3.2×10^{-2} and is based on a 10CFR20 value of 1.0×10^{-9} ci/m^3 and 3.15×10^{7} sec/yr

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5.2 Potential Accidents

While one could postulate accidents caused by natural phenomena, such as earthquakes or tornados the probability of occurrence of these events is sufficiently low, when considered with the relatively short operating time of this facility, that their potential consequences do not need to be evaluated.

The only accident which may reasonably occur would be the potential loss of a liquid decontamination solution to the Waste Handling Building. However since the building is designed to contain approximately 1300 gallons of liquid, the only consequence of such a spill would be confined to the Waste Handling Building and would be a minor disruption in operation until the spill was cleaned up.

5.3 Conclusions

Based on the above, it can be concluded that the potential radiological consequences associated with operating this facility are orders of magnitude below applicable regulatory guidelines.

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6.0 Conformance to 10CFR 50.59

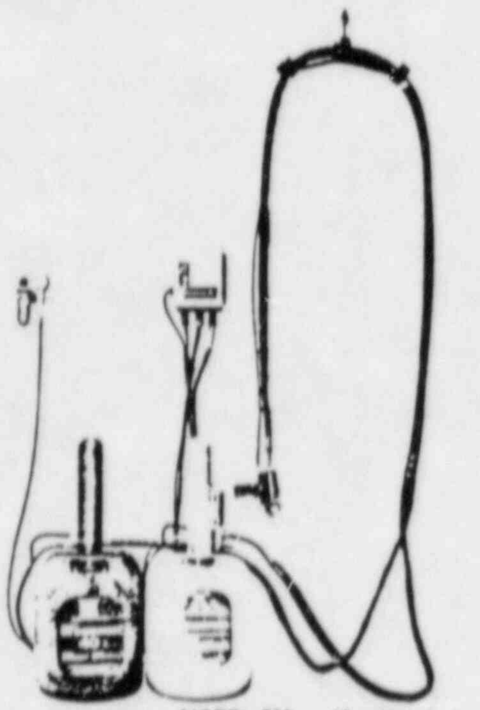
10CFR50.59 states that a "production or utilization facility (i) may make changes in the facility as described in the safety analysis report...without prior Commission approval, unless the proposed change... involves a change in the technical specifications incorporated in the license or an unreviewed safety question." 10CFR50.59 also states "A proposed change... shall be deemed to involve an unreviewed safety question (i) if the probability of occurrence or malfunction of equipment important to safety previously evaluated in the safety analysis report may be increased; or (ii) if a possibility for an accident or malfunction of a different type than any evaluated previously in the safety analysis report may be created; or (iii) if the margin of safety as defined in the basis for any technical specification is reduced."

Since the operation of this facility does not require any changes to the plant technical specifications, does not reduce the margin of safety and does not result in any accident different from those evaluated in the safety analysis report it is concluded that an unreviewed safety question does not exist. Consequently, prior Commission approval is not needed for the erection and operation of this facility.

APPENDIX B

INSTAPAK®
Foam-In-Place

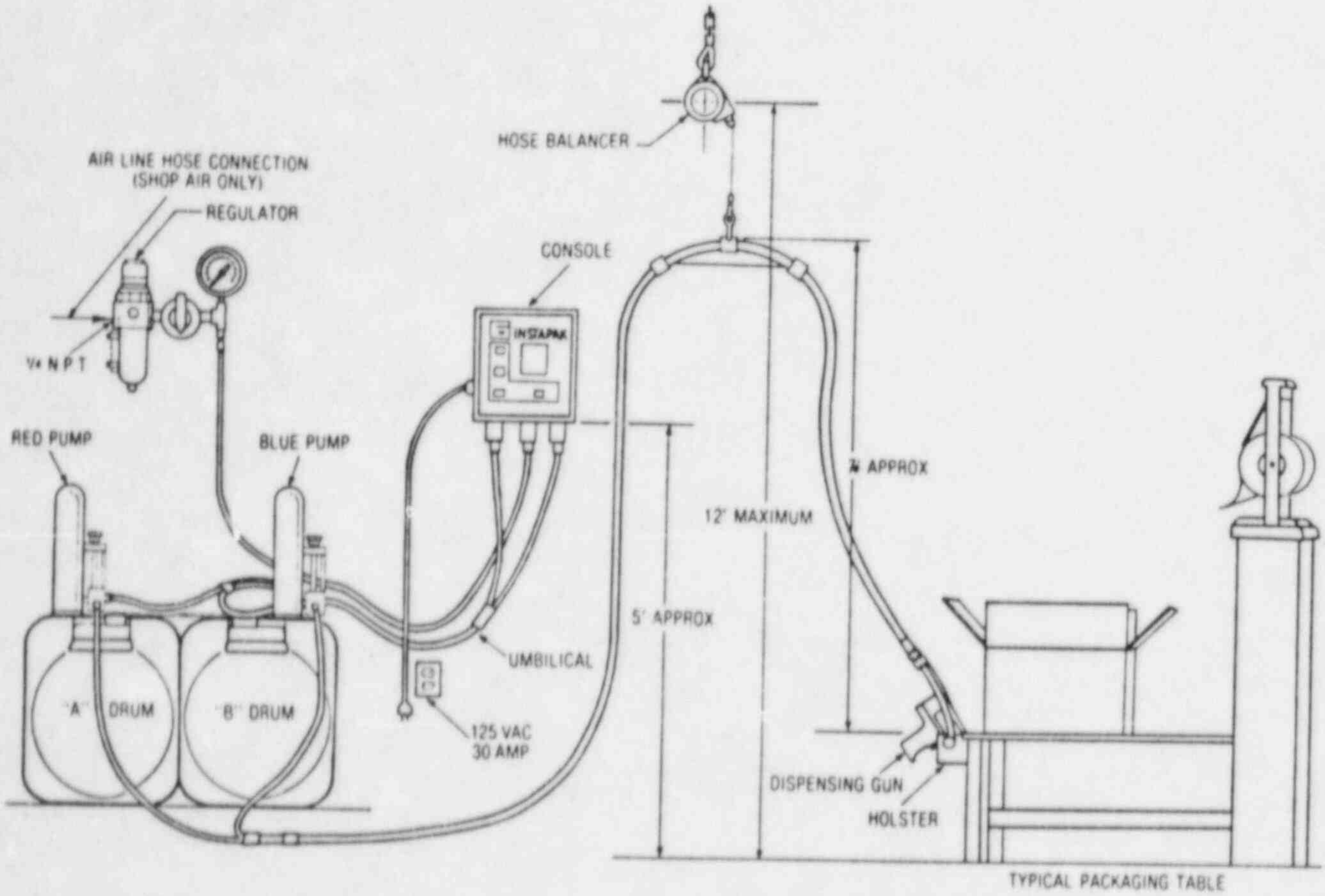
Model 750/760 Packaging Systems

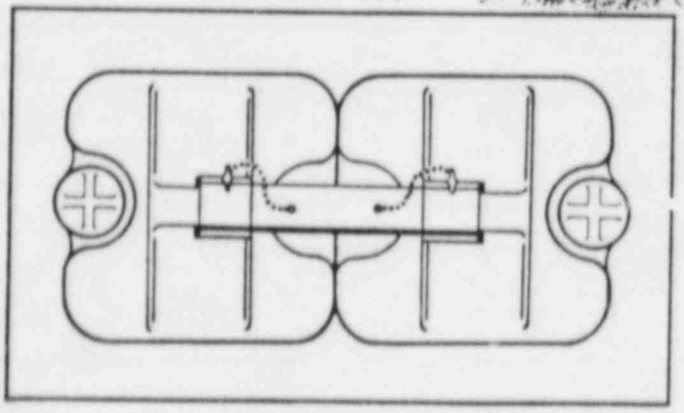


MODEL 750 — 15 gallon drums

MODEL 760 — 55 gallon drums

TYPICAL INSTALLATION 750/760





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Technical Data Sheet

Instapak
Sealed Air Corporation
Old Sherman Turnpike
Danbury, CT 06810
(203) 792-2360

INSTAPAK-200

RIGID BLOCKING AND BRACING

PACKAGING FOAM

CHEMICAL CHARACTERISTICS

	Component 'A'	Component 'B'
Composition	Polymeric Isocyanate (Polyarylene Polyisocyanate)	Polyurethane Resin
Storage Temperature Range	20-100°F	20-100°F
Optimum Temperature Range for Containers at Time of Use	60-90°F	60-80°F
Flash Point*	415°F	Approximately 400°F

*At over 80°F containers will be under pressure - Open with care!

If 'B' component freezes, it can be thawed without adverse effect. (Do not apply heat source - Allow to warm in normal ambient temperature.)

AVERAGE PERFORMANCE CHARACTERISTICS

Cream time . . . . Immediate

Rise time . . . . 35 Seconds

Tack free time . . . . 45 Seconds

Demold time after closing mold . . . . 2-5 Minutes

Expansion (liquid to foam volume) . . . . Over 30 Times

Free rise core density, pounds per cubic foot . . . 2.0 pcf

Compressive strength, nominal . . . . 30 psi

K factor, BTU/hr./sq. ft./in./°F, Average 0.15

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CHEMICAL COMPONENTS

Chemical Component A is known as polymeric isocyanate or crude MDI. Its generic chemical name is polymethylene polyphenyl polyisocyanate. It contains diphenylmethane diisocyanate. As a reactive chemical, hazards can be created through careless or improper handling. The purpose of this publication is to outline proper use and certain precautions, the observance of which will circumvent these hazards.

Chemical Component B is commonly known as a polyol. The typical generic chemical name of polyol is polyoxalkylated glycol. It reacts with isocyanates and is chemically similar to many detergents.

Some Component B formulations contain a chlorofluorocarbon blowing agent. The fluorocarbon is only hazardous at high vapor concentrations which do not occur in normal handling and use. (See Emergency Handling.)

Typical Properties

	Component A	Component B
Physical state at normal temperatures	Oily dark brown liquid	Straw colored liquid
Specific gravity (at 25°C)	1.24	Approx. 1.1*
Boiling point (°0)	Polymerizes about 260°C with evolution of carbon dioxide	Approx. 50*
Flash point (°C)	213	Approx. 200 (See Fire, p.6)
Vapor density (air=1)	8.5	4.8*
Vapor pressure (mm Hg @ 25°C)	Less than .0001	Approx. 50-100*

*Varies somewhat with different systems. See individual data sheets. These properties are for those systems containing chlorofluorocarbon.