Consumers Energy

A CMS Energy Company

Big Rock Point Restoration Project
10269 US-31 North
Charlevoix, MI 49720

**Kurt M. Haas**
General Manager

September 16, 2004

Mr. Anton Martig
Region 5, US Environmental Protection Agency
Toxics Program Section
Waste Pesticides and Toxics Division
77 W. Jackson Blvd (DT-8J)
Chicago, IL 60604-3590

**Re: Consumers Energy Company - Big Rock Point Containment Shell Dismantlement - Request for Approval of Alternative Approach to Mitigate Risk**

Dear Mr. Martig,

Consumers Energy would like to thank you for your time and consideration regarding the technical difficulties associated with dismantling the Containment shell at the Big Rock Point facility.

We are herein requesting EPA approval of an alternative approach to dismantle portions of the Containment shell in order to mitigate the risk to worker health and safety posed by the unique nature of this project. The attached document provides background information, description of planned dismantlement techniques including a discussion of paint removal methods, risk analysis of applicable health and safety issues and environmental impacts associated with this project, and waste disposal considerations as the basis for the specific request for approval of an alternate dismantlement method for portions of the Containment structure (as outlined in Section 5.0 of the attached detailed request).

Consumers Energy believes that the approach contained in this request will facilitate the safe dismantlement of the Containment structure for the following reasons:

1. The individuals performing the work are afforded the maximum safety and health protection attainable.
2. The overall worker risk and hazard exposure is maintained at a minimum from an overall project standpoint.
3. There is no unreasonable risk to the environment.
4. All work will be performed in accordance with applicable local, state and federal regulations.

It is our hope that the Containment dismantlement process can be performed as outlined in the attached document and within existing project schedules to facilitate safe exterior work while weather permits. Consumers Energy respectfully requests your approval of this alternative method for dismantlement as soon as possible but no later than December 15, 2004 to allow adequate work planning time. If you have any questions, please feel free to contact either Tracy Goble (231-547-8389) or Ward Wilson (517-788-1969). Thank you again for your thoughtful consideration of this project.

Sincerely,

Kurt M. Haas
Site General Manager
Big Rock Point Restoration Project

cc: TA Goble, Big Rock Point
KE Pallagi, Big Rock Point
WJ Wilson, ConsumersEnergy
A Merricle, Michigan Department of Environmental Quality
NRC MNSS Project Manager
NRC Decommissioning Inspector - Big Rock Point

**Big Rock Point Containment Shell Dismantlement**
**Request for Approval of Alternative Approach to Mitigate Risk**

## 1.0 Background

The Big Rock Point (BRP) site is owned by Consumers Energy Company and is located in Charlevoix, Michigan. Formerly, BRP was a 75 MW nuclear generating station. The plant began commercial power generation in 1962, and after 35 years of safe operation, the plant was permanently shutdown in 1997. Immediately following shutdown, Consumers Energy began the process of decommissioning the facility in accordance with U.S. Nuclear Regulatory Commission (NRC) regulations (10CFR§50.82).

As part of the decommissioning project, Consumers Energy plans to dismantle the Containment building in mid-2005. The Containment building is a spherical, carbon steel shell approximately 130 feet in diameter with a nominal steel thickness of three-quarters inch. Approximately three-quarters of the Containment shell is above grade. The base of the Containment is 28 feet below ground level at an elevation of 565.5 feet and the top of the shell is approximately 102 feet above grade at the 695.5-foot elevation. The steel shell weighs approximately 1.6 million pounds. Attachment A provides detailed drawings of the Containment building.

The interior of the Containment shell is coated with a paint containing low concentrations of polychlorinated biphenyls (PCBs)[1]. The interior paint coating was applied at the time of original plant construction (circa 1960). The PCB-containing paint is uniformly applied to the interior of the Containment structure from elevation 595 feet to the top of the shell at elevation 695.5 feet. Design specifications for postulated nuclear accident scenarios required that the Containment interior coating be able to withstand high pressure and temperature conditions for long periods; therefore, the original interior coating was maintained throughout the entire operational life of the Big Rock Point plant. The exterior coatings of the Containment shell have been analyzed and do not contain PCBs.

The task of dismantling the Containment shell is considered unique when compared to typical building demolition projects. Demolition of the Containment shell requires this structure be cut into pieces; these pieces are then to be lowered and further cut to a size to meet packaging, transportation and disposal requirements. Demolition of the Containment shell involves specific industrial safety considerations because of its size, shape, location in relation to other demolition activities, presence of internal structures, and potential radiological contamination concerns. Consumers Energy believes that the primary consideration for dismantlement of the Containment shell is minimizing the risks to workers performing the demolition. The environmental impact associated with disturbance of interior paint coatings with low-level PCB concentrations is considered minimal when compared with worker safety issues.

[1] The average PCB concentration of the Containment interior coating is 31 ppm, (8 – 58 ppm range) for samples collected to date.

## 2.0 Planned Containment Shell Dismantlement Technique

Based on an evaluation of this demolition project, it has been determined that thermally cutting the Containment shell into sections is the safest and most reliable method of dismantlement. The planned work scope requires workers to cut large sections of the steel shell into predetermined sizes and shapes. The Containment sections above the equator (elevation 630.5 feet) would be cut from the exterior, removed, and lowered to the ground with a crane. The lower sections below the equator would be cut from the inside and lowered to the ground in a similar manner. There are a total of 86 steel shell sections to be cut above grade level with the approximate maximum size of these sections estimated to be 27 feet x 20 feet. These large sections would be further size-reduced at ground level as required for packaging and off-site disposal. Thermal cuts will be made using a plasma torch, oxy-fuel gas cutting torch, or other high-temperature device. A crane or manlift will be utilized to position the worker at the various cut location elevations. For cutting of the upper Containment sections, the torch would be located on the outside of the shell, limiting worker exposure to PCBs, therefore, providing an additional measure of safety between the worker and the interior coating.

*Paint Removal*

Big Rock Point site safety requirements generally specify that paint removal be performed prior to using any type of high-temperature cutting device. If interior paint removal was required prior to thermal cutting of the Containment shell, a strip of paint approximately 12 inches wide along all cut-lines would need to be removed. The paint removal process would employ worker-controlled wheel scabbling with vacuum head, ultra high pressure (UHP) water-jet cleaning with a closed-loop collection system, or abrasive scraping. These technologies have proven to be very effective at controlling emissions and rendering an appropriate clean work surface on many large structures. All feasible paint removal processes require that the workers hold the equipment to the Containment surface. In order to affect this, worker placement would occur as described below:

1. Interior paint removal above the 630.5-foot equator elevation would be performed using a combination of high-reach skylifts, scaffolding constructed on the emergency condenser level floor (elevation 660 feet), and scaffolding constructed from the platforms and slabs at elevation 616 feet. These scaffolds would be elaborate, multi-level and curved in plan. The concave shape of the interior Containment presents a significant safety challenge for adequately securing elevated scaffold platforms. Many man-hours would be required to erect and dismantle this scaffolding. In addition, the curvature of the Containment shell necessitates workers holding equipment overhead, at an angle for an extended time period, posing ergonomic difficulties to workers.
2. Interior paint removal below the equator (630.5 feet) to the 599.5-foot and 616-foot floor elevations will utilize workers in scissors lifts, skylifts, or on scaffolds constructed from these floor elevations.
3. Only a small area of paint is present in the lower portions of the interior Containment shell wall below the 599.5-foot elevation. Necessary paint removal below this elevation will be accomplished with the workers located on scaffolding or directly on the concrete ledge at elevation 593 feet. While access is somewhat limited in this area, work does not require protection against fall hazards.

5. Exterior paint, insulation and mastic coating will be removed along cut-lines to a width of approximately 12 inches prior to thermal cutting.

Attachment A provides drawings showing the physical layout of the Containment interior and exterior along with a site plan depicting the area surrounding the Containment structure. Attachment A also provides details of the Containment proposed cut-lines locations and supporting data. Attachment B contains the Containment Demolition Scheduleillustrating the project sequence for exterior coating removal, interior paint removal, thermal cutting, and demolition.

## 3.0 Risk Analysis - Health and Safety and Environmental Impact

Consumers Energy planning and technical personnel have performed a risk analysis of this project and determined that leaving the interior paint intact for the thermal cutting process meets the guiding principles of the project and OSHA regulations to minimize worker exposure and risk. The Containment interior portions associated with this request would be limited to those areas above the 630.5-foot elevation that pose a significant fall hazard. While it is expected that PCBs immediately adjacent to the cut-line would be thermally destroyed (converted to hydrochloric acid and water) due to the high operating temperature of the flame torch, the products of incomplete combustion (PICs) beyond the cut-lines may be released in small quantities due to lower temperatures. Since the workers performing the thermal cuts would be located on the outside of the upper Containment shell, exposure to PICs from PCBs contained in the interior coating would be minimal during the cutting process. Attachment C addresses important health and safety issues as well as environmental issues associated with the project. Appropriate worker protection and engineering controls will be utilized for all thermal cutting procedures. A discussion of the anticipated personal protective equipment (PPE) to be utilized for the project is provided in Attachment D.

Consumers Energy believes from a risk-based perspective, thermal cutting with the paint in place on the upper portion of the Containment interior is preferred in terms of worker health and safety. The environmental risk resulting from the potential disturbance of less than 0.01 pounds of PCBs is insignificant when compared to the objective worker risks associated with the removal of the paint on the upper shell (see Attachments A and C).

## 4.0 Disposal of the Containment Shell Pieces

The specification-cut pieces of the Containment shell are currently targeted for disposal at a Michigan-licensed Type II landfill or a licensed PCB landfill located in Michigan depending on the final PCB concentration determination of the Containment shell sections. Disposal will be in accordance with all state and federal regulations and approved Big Rock Point programs. Onsite waste management of the steel sections will be conducted in accordance applicable regulations, site procedures, and established practices.

## 5.0 Request for Approval of Alternate Dismantlement Method for Portion of the Containment Shell

While the process for interior paint removal can be performed from a technical standpoint, there are significant health and safety concerns associated with work at elevation for the upper portion (above the 630.5-foot equator elevation) of the Containment interior shell exposing workers to unnecessary risks. Consumers Energy is requesting that the EPA grant approval to thermally cut portions of the Containment shell above the equator elevation of 630.5 feet with the paint intact. It is believed that the paint should remain in place for the thermal cuts above the equator due to the excessive fall hazard risks posed to workers resulting from the combined height and angle of the cut-line, curvature of the Containment shell, physical obstructions inside the Containment, and time required to erect and dismantle multi-level, curved scaffolds. The total cut-line distance for this waiver request is 2700 linear feet; this corresponds to less than 0.01 pounds of PCBs contained in the associated paint volume.

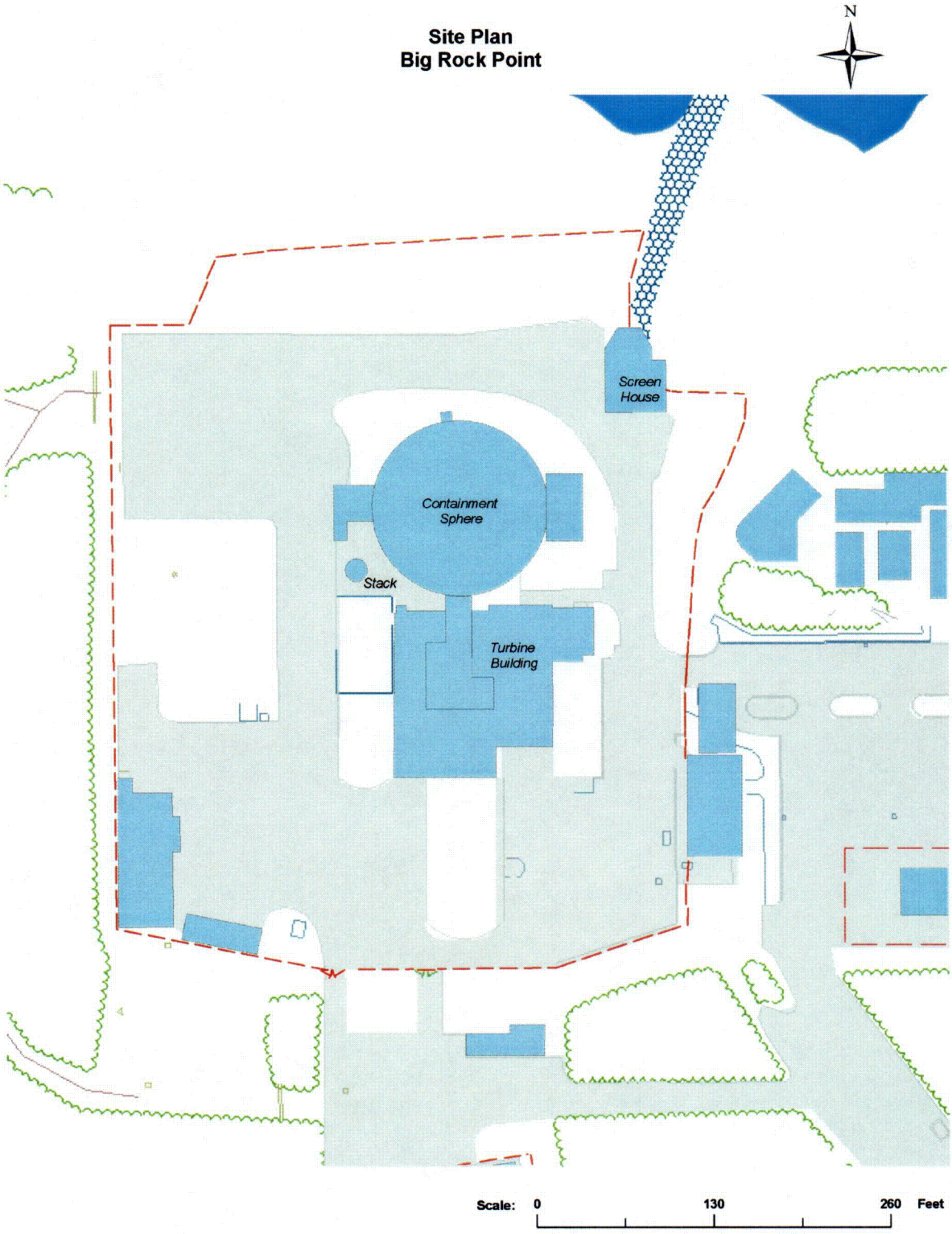
Consumers Energy believes that the interior paint can safely be removed without unacceptable worker risk prior to both performance of thermal cuts below the equator and size reduction of the shell pieces at ground level.

## Attachment A

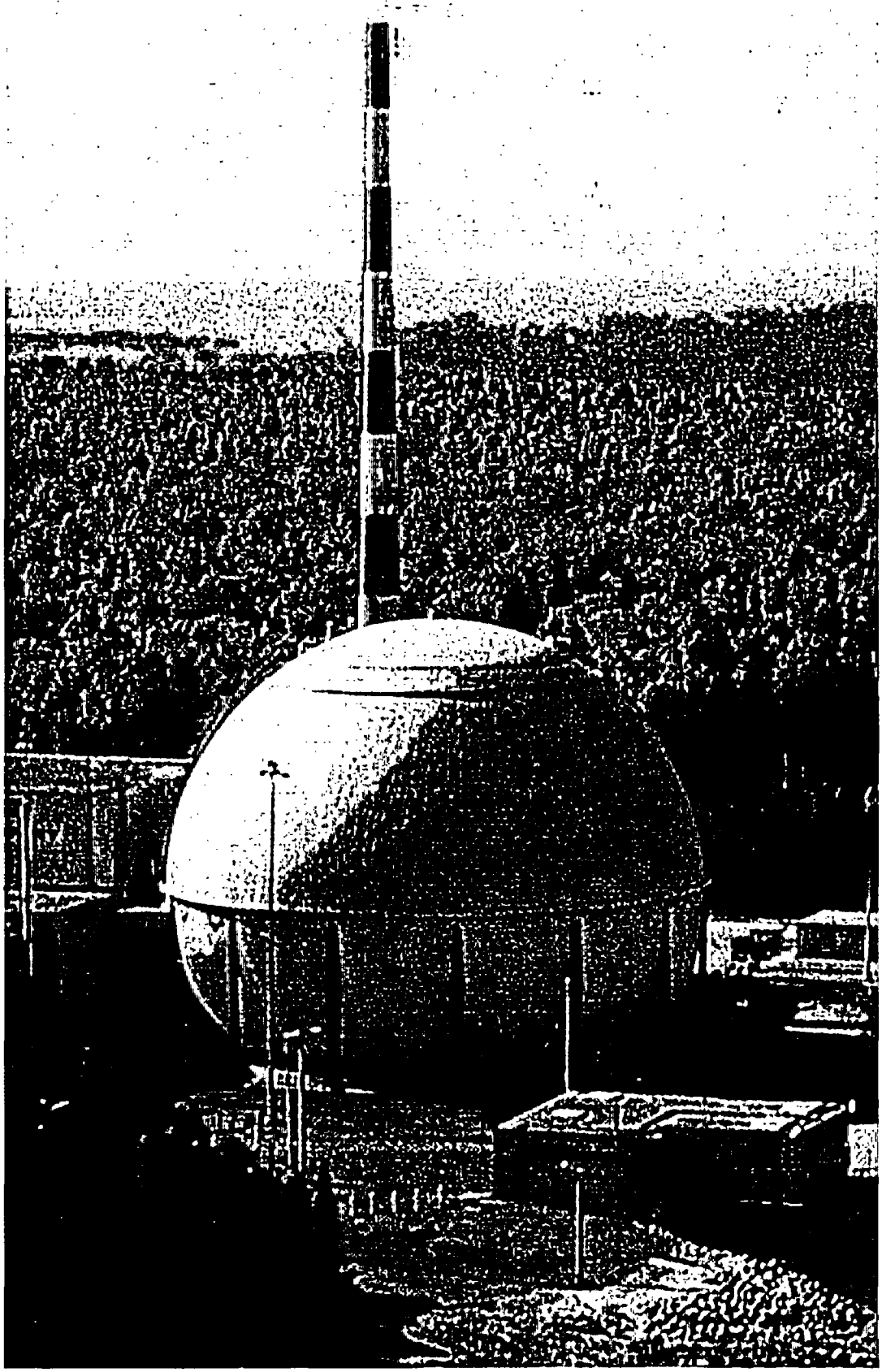
## Containment Shell Cut-lines and Supporting Information

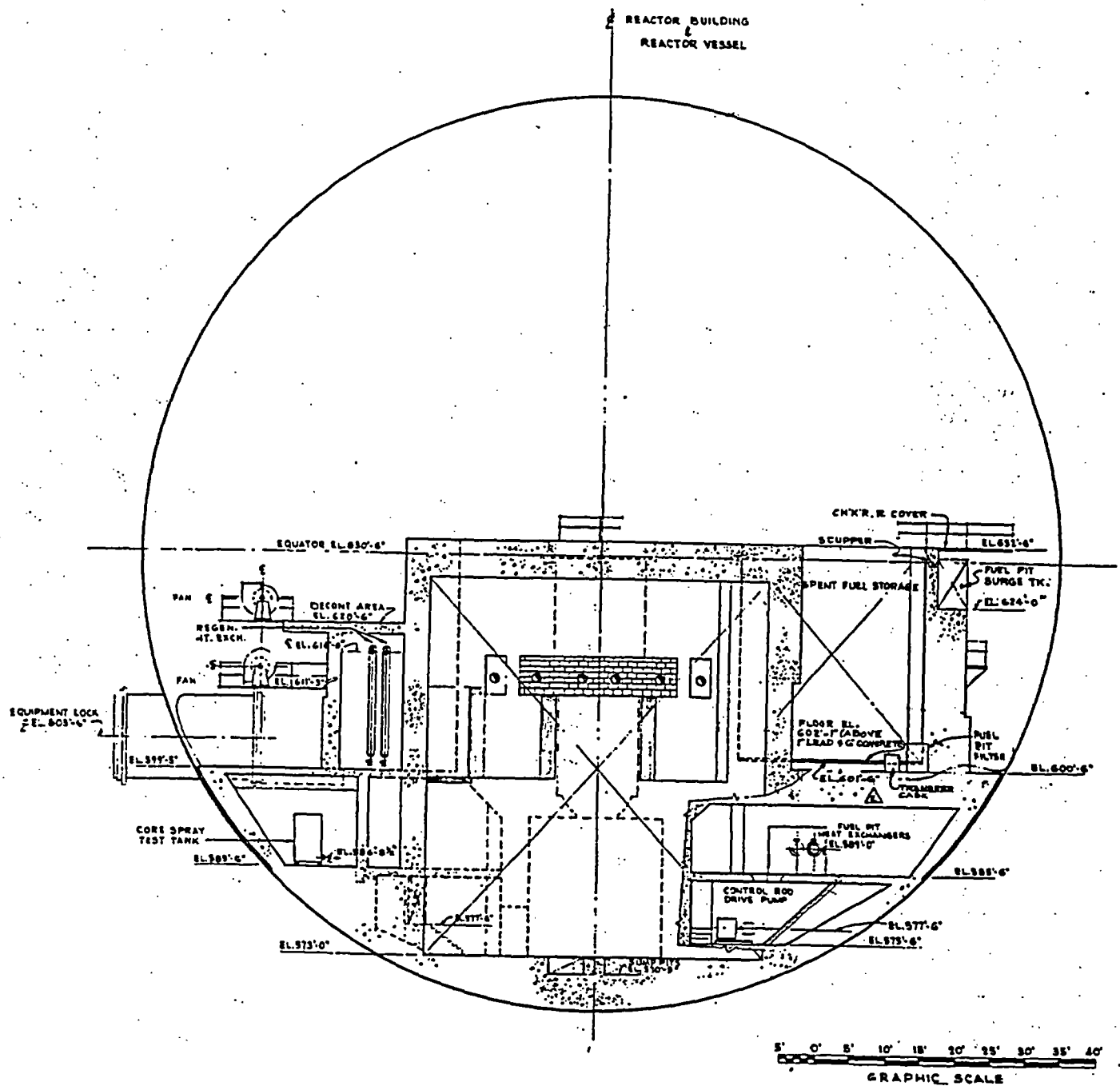
- Site Plan
- Containment Pictures and Drawings
- Plan and Elevation Views of Proposed Cut-lines
- Supporting Data

**Site Plan**
**Big Rock Point**

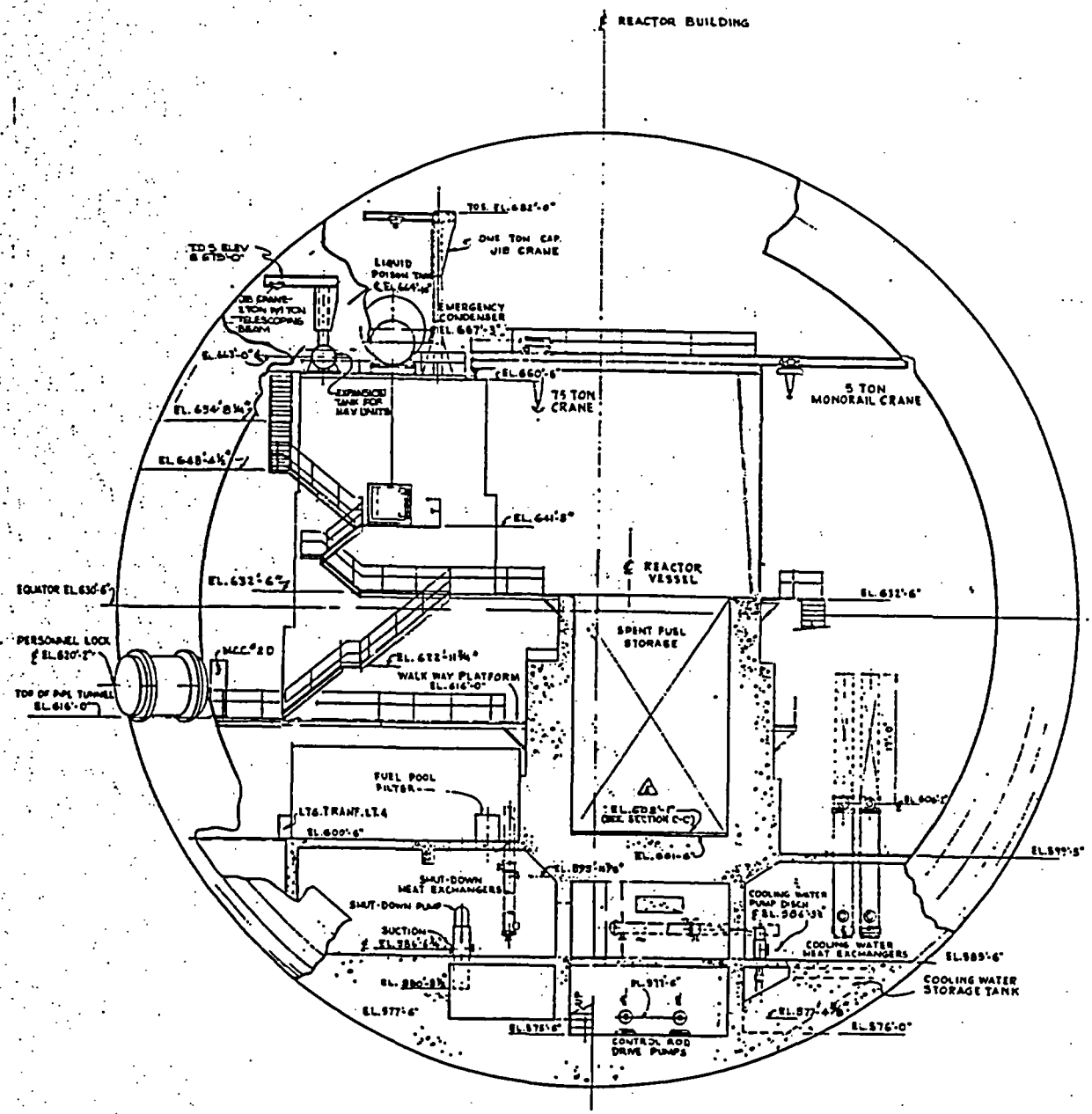



C01

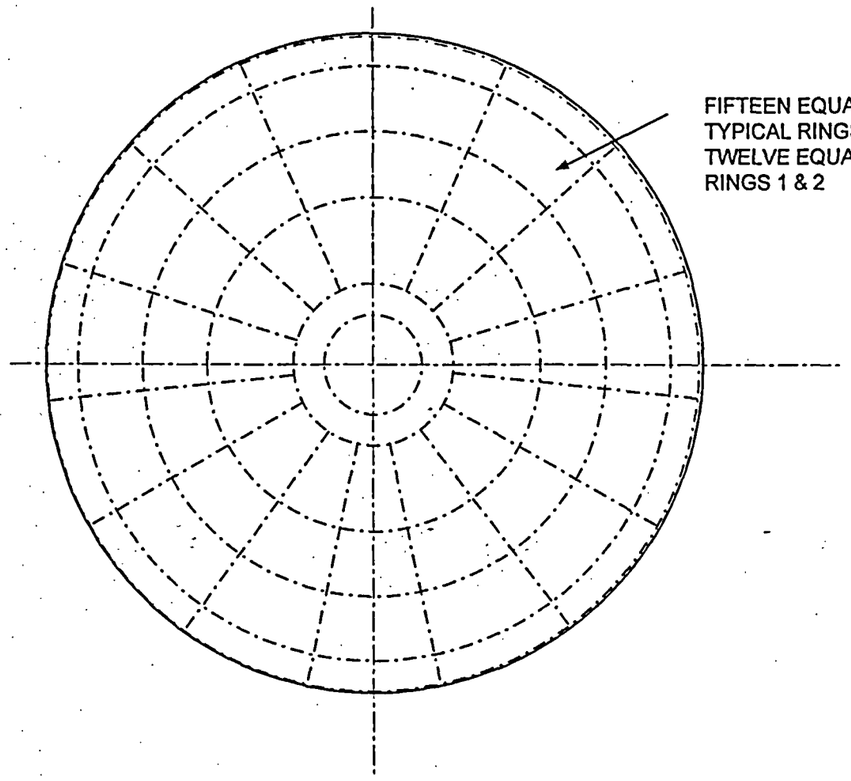




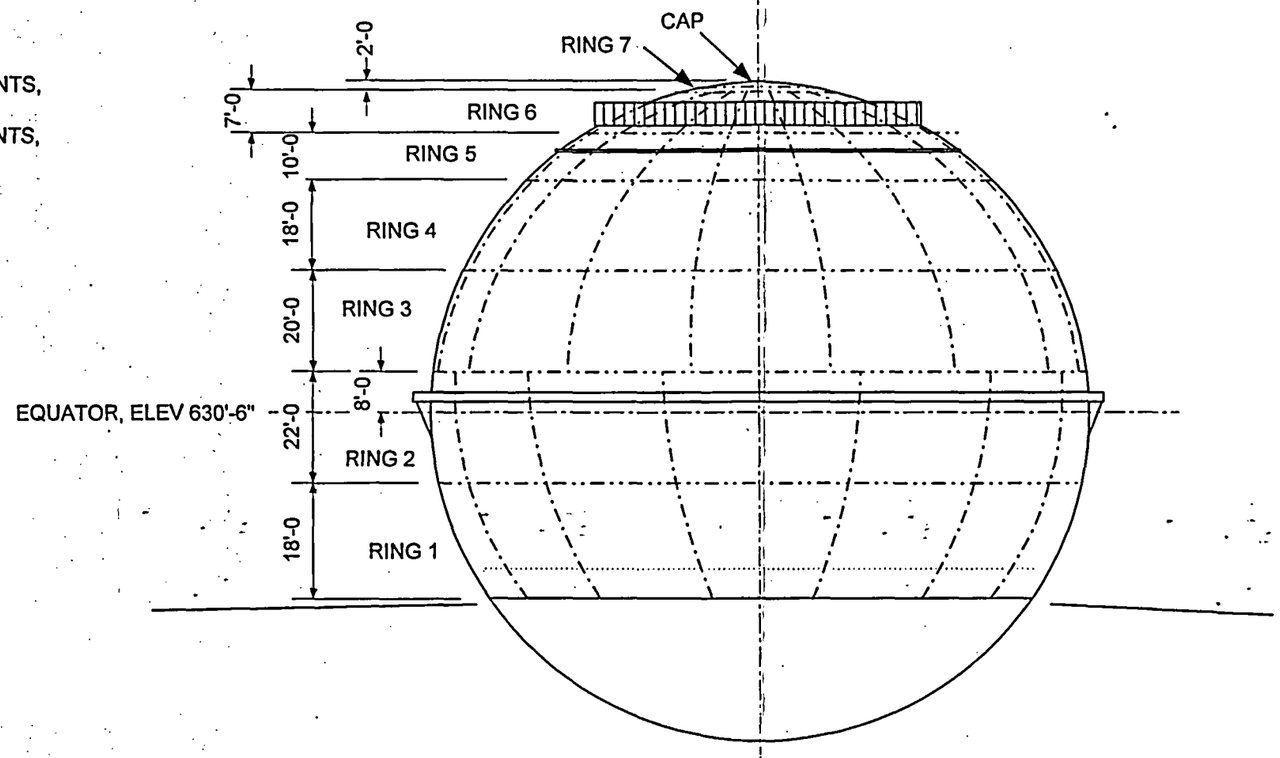

Containment Cross-Section
Looking North




Containment Cross-Section
Looking West




TOP VIEW

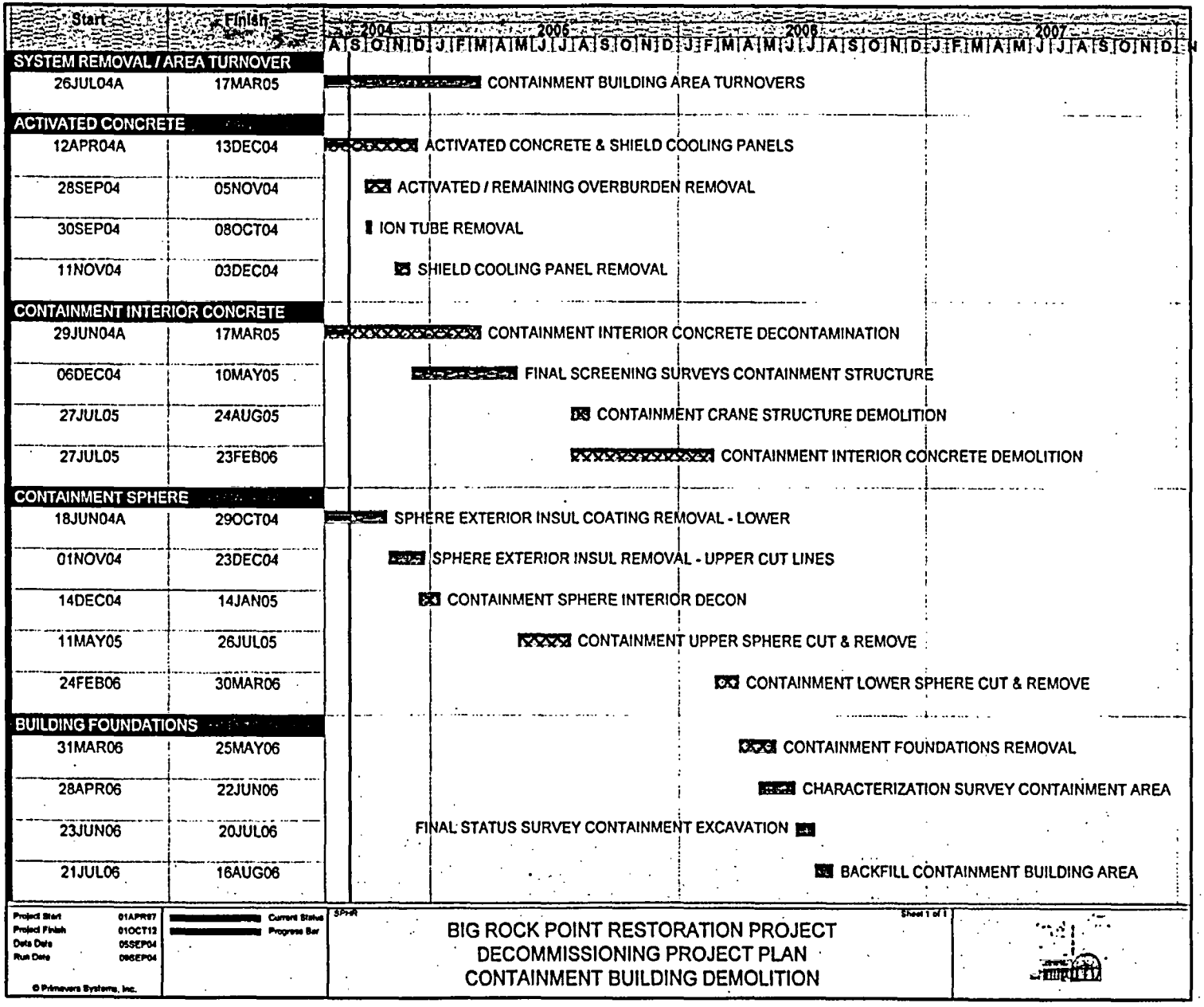



TYPICAL ELEVATION

| | | | | |
|---|---|---|---|---|
| | BIG ROCK POINT RESTORATION PROJECT | | | |
| | SPHERE DEMOLITION<br>PROPOSED CUT PLAN | | | |
| B GENERAL REV SMP 9/08/04 | SIZE | FSCM NO | DWG NO<br>SK-DEMO-825 | REV<br>B |
| A SMP 8/25/04 | SCALE 1in = 30ft. 0in. | | SHEET 2 OF 3 | |

Table A-1. Supporting Data

| Description | Value | Units |
|---|---|---|
| Containment inside radius | 65 | ft |
| Surface area of Containment (inside) | 53093 | $ft^2$ |
| Circumference at equator | 408.2 | ft |
| Length of large-cut Containment shell section | 27 | ft |
| Width of large-cut Containment shell section | 20 | ft |
| Number of large-cut sections of Containment shell | 86 | -- |
| Length of cut-lines with interior paint remaining on steel shell above equator | 2700 | linear feet |
| Pounds of PCB contained in paint along cut-lines above equator (see Attachment C) | 0.004 | pounds |




**Attachment B**

**Containment Demolition Schedule**

## Attachment C
## Health and Safety and Environmental Impact

After considerable evaluation, thermal torch cutting with the interior paint left intact in specified areas emerged as the preferred method of Containment dismantlement. The evaluation assessed hazards and risks associated with working at high elevations, including utilizing equipment overhead on concave surfaces, during postulated PCB-containing paint removal activities on the Containment interior shell above the equator. This conclusion is based on several factors including worker fall protection, emergency rescue considerations, potential for operator error, worker chemical exposure, and environmental impact and protection as discussed below.

Paint removal from the Containment interior shell would employ worker-controlled techniques including a wheel scabbler with vacuum head, ultra high pressure (UHP) water-jet cleaner with a closed-loop collection system or abrasive scraping. While these technologies have proven to be very effective at controlling emissions and rendering an appropriate clean work surface on many large structures, workers must hold the equipment to the Containment surface. In order to affect this, worker placement would occur as described below:

1. Interior paint removal above the 630.5-foot equator elevation would be performed using a combination of high-reach skylifts, scaffolding constructed on the emergency condenser level floor (elevation 660 feet), and scaffolding constructed from the platforms and slabs at elevation 616 feet. These scaffolds would be elaborate, multi-level and curved in plan. The concave shape of the interior Containment presents a significant safety challenge for adequately securing elevated scaffold platforms. Many man-hours would be required to erect and dismantle this scaffolding. In addition, the curvature of the Containment shell necessitates workers holding equipment overhead, at an angle for an extended time period, posing ergonomic difficulties to workers.
2. Interior paint removal below the 630.5-foot equator elevation to 599.5-foot and 616-foot floor elevations will utilize workers in scissors lifts, skylifts or on scaffolds constructed from these floor elevations.
3. Only a small area of paint is present in the lower portions of the interior Containment shell below the 599.5-foot elevation. Necessary paint removal below this elevation will be accomplished with the workers located on scaffolding or directly on the concrete ledge at elevation 593 feet. While access is somewhat limited in this area, work does not require protection against fall hazards.
4. Exterior paint, insulation and mastic coating will be removed along cut-lines to a width of approximately 12 inches.

***Worker Fall Protection***

It is a generally accepted fact that falls are a leading cause of workplace fatalities in the construction industry. With regards to fall hazards, OSHA prefers prevention (hazard elimination) to protection (harnesses and lanyards). Workers in elevated positions are required to use fall protection equipment to prevent injury in the event that a worker trips or falls from the elevation.

Containment shell interior paint removal above the equator will require working at elevations between 35 – 85 feet above the floor elevations. Considerations for worker fall hazards will include fall exposure, emergency recovery, emergency evacuation, and stabilization of life-threatening injuries. A significant hazard is one that can result in a life-threatening consequence or an inability to perform self-rescue or self-recovery. A brief presentation of each hazard follows:

- *Fall Exposure*: Assembly of scaffolding, work from the finished platform, and dismantlement of the scaffolding pose hazards within the Containment. Further, due to the curvature of the Containment, scaffold construction will likely require additional man-hours beyond what would normally be necessary for similar vertical heights. Scaffold assembly and dismantlement occur with increased exposure to fall hazards, as safe anchorages or working platforms would not exist. At an estimated maximum height of 85 feet, the amount of time spent staging equipment, assembling scaffold, performing paint removal, and dismantling scaffold significantly increases the exposure time to life-threatening hazards for personnel assigned to the tasks. Operations involving scaffolding in this environment must be continuously monitored to verify the structure remains intact and other demolition activities within the Containment do not pose hazards to the scaffold or workers on it.

- *Emergency Evacuation:* If, for any reason, an emergency evacuation is ordered involving operations within the Containment, workers on scaffolding will be unable to make a smooth egress. They will face obstructions, equipment difficulties, fall exposure, potential impacts from nearby operations or problems, potential entanglement, and encumbrances posed by the extra fall protection PPE and work equipment used for coating removal. Working under these conditions poses a high likelihood of hazard in the event of an emergency evacuation.

- *Fire:* Combustibles and hot work are administratively controlled. While the Containment interior is not combustible, scaffold planks, polyethylene sheeting (fire retardant or otherwise), lighting and heating systems present sources of fuel and ignition. There is no longer an operational ventilation system or other source of breathing air within the Containment should smoke conditions become life threatening. Additionally, lighting service must be adequate and include backup systems.

***Emergency Rescue***

Risk of injury, particularly when the work involves unique complexities associated with the paint removal process, is always present. Failure of the aerial lift or scaffold platform system will require implementation of a recovery plan. The resources required are significant for a postulated recovery of a 200-pound worker at elevations up to 85 feet. The nearest high-angle rescue units (volunteer and professional) require at least an hour to mobilize at the site as there are potential difficulties in getting emergency equipment inside the Containment and efforts to reach a victim could expose rescue workers to additional elevation hazards. A medical emergency on a platform or basket places the victim at least 30 minutes from advanced medical care in Charlevoix or Petoskey, Michigan, under the best of circumstances.

***Operator Error***

The operator assigned to the aerial lift will be subject to environmental stressors (heat or cold) and ergonomic stressors (equipment weight, cage restrictions) that will degrade performance and safety. Review of accidents resulting from elevated work often indicates operator error is a significant part of the cause. Given the dimensions of the work, it will be impossible to closely monitor the worker for symptoms of stress and fatigue. Communications will be via radio, voice, and hand signals without benefit of close visual monitoring. A weary or hurried worker may suffer a fall simply by leaning beyond the guardrails.

***Worker Chemical Exposure***

Prior to commencement of any new work activity, a job-specific plan is developed for the work process. This document specifies the applicable PPE as well as other types of protective equipment and engineering controls appropriate for the assigned task. In addition, a pre-job brief is held prior to the implementation of the work activity. At this time, the work plan will be discussed and the workers may question any of the details associated with the planned work activity. Chemical exposure to workers associated with high-temperature cutting of PCB-containing painted metal surfaces will be controlled in accordance with OSHA, Consumers Energy, and BRP site requirements and procedures. Communication between on-site industrial safety personnel and a corporate industrial hygienist will occur, as necessary, for evaluation of work efforts, determining potential worker exposure, and determining proper PPE and respiratory protection required in the performance of work.

All workers who may potentially be exposed to chemical vapors will be equipped with chemical protective clothing as appropriate. While it is expected that PCBs immediately adjacent to the cut-line would be thermally destroyed (converted to hydrochloric acid and water) due to the high operating temperature of the flame torch, the products of incomplete combustion (PICs) beyond the cut-lines may be released in small quantities due to lower temperatures. Since the workers performing the thermal cuts would be located on the outside of the upper Containment shell, exposure to PICs from PCBs contained in the interior, coating would be minimal during the cutting process.

Respiratory protection will be provided for those involved in cutting operations. The Consumers Energy respiratory protection program meets the requirements of 29CFR191.134 and includes training of workers regarding the proper use of fit testing, inspection, maintenance, and cleaning of respirators. Personal air monitoring will be performed to ensure that emissions from the cutting operations are controlled effectively by engineering measures, work practices, and that the level of respiratory protection is adequate for the hazard.

***Environmental Impact***

Potential disturbance of PCBs from paint removal along 12-inch wide strips at cut-line locations on the upper Containment shell are addressed using the following assumptions:

- Thickness of PCB coating: 0.005 inches
- PCB concentration: 58 ppm maximum
- Estimated dry weight of paint: 63 pounds/$ft^3$
- Total length of cut-lines above equator: 2700 linear feet
- Width of cut-lines: 12 inches (1 foot)

Using the above assumptions, the total quantity of PCBs contained in the interior paint along cut-line abatement locations equates to only 0.004 pounds. Release of products of incomplete combustion of PCBs beyond the cut-lines would only be released in minute quantities. Further, the surface temperature adjacent to the thermal cut location is expected to fall to less than 1000°F, two inches from the cut. The thermal disturbance of this very small amount of PCBs and PICs is considered to have an extremely minimal environmental impact resulting from air emissions.

***Environmental Protection***

Thermal cutting and material handling will proceed under the following controls to prevent excess disturbance of PCB coatings.

- High Efficiency Particulate (HEPA) filters and a local exhaust ventilation system will be employed, as necessary, to collect fume emissions as dictated by work orientation and worker safety.
- Work site housekeeping and inspections will ensure PCB-containing paint chips, debris or metal slag from cutting operations are cleaned up after cutting operations are completed.
- Size-reduction activities (paint removal followed by thermal cutting) for the purpose of creating shell pieces that fit into disposal containers will be performed in a designated area at ground level and as soon as practical, following radiological surveys, to prevent accumulation of cut sections exposed to outdoor environmental conditions.
- Final cut sections of the Containment shell will be loaded directly into designated containers prior to off-site transport to the designated facility(ies) in accordance with established site programs, procedures and agreed upon practices.

## Attachment D
## Personal Protective Equipment

The following Personal Protective Equipment (PPE) is recommended for the Big Rock Point Containment shell thermal cutting. To ensure the safety of the workers, this task will be performed using Level C PPE (see Table D-1 below). Based on the risk assessment, the primary routes of exposure are respiratory and dermal. In addition to PPE requirements, Consumers Energy will use administrative and engineering controls to minimize potential exposure. Engineering control measures include positioning elevated platform up-wind of cut-lines and rotating personnel assigned to higher-risk tasks.

### Table D-1. PPE Requirements

*Contaminants of concern: PCBs (Arochlor 1254), Lead*

| Modified Level C | |
|---|---|
| **Required PPE** | **Contaminant Concentration[1]** |
| Appropriate respirator with combination particulate/organic vapor cartridges. | PCBs: Greater than or equal to 0.5 $mg/m^3$<br>Lead: Greater than or equal to 50 $Tg/m^3$ |
| Disposable flame resistant coveralls with head and foot coverings. | |
| Dedicated flame retardant leather gloves. | |
| Safety shoes, hard hats, eye/face protection, and fall-protection equipment in accordance to Consumers Energy and OSHA standards. | |

[1]Personal air monitoring for PCBs and lead will be conducted daily to ensure worker safety and comply with OSHA standards. If concentrations for PCBs or lead exceed specified concentrations, with respect to respiratory protection, shown in Table D-1, Level B (supplied air respirators) will be used.