



**ENTERGY NUCLEAR NORTHEAST  
Engineering Report Cover Sheet**

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**IP2 ASME SECTION XI,  
IWL CONCRETE CONTAINMENT INSPECTION  
FOR 2005**

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## 1.0 Scope and Objectives

This report satisfies the IWL requirements for the 2<sup>nd</sup> period of the 1<sup>st</sup> interval, and complements the report completed by Sargent & Lundy, “Containment Inservice Inspection First Period Examinations,” in 2000 for the concrete containment of Indian Point Unit 2.

This report documents the general visual inspection of Class CC components and the Reinforced Concrete shell of Class CC pressure retaining components of the Vapor Containment (VC) for Unit 2 at Indian Point Energy Center. The inspection was done to identify signs of structural degradation that may affect structural integrity or leak tightness and to identify the required repairs and/or replacement activities to minimize degradation due to environmental condition and aging. In addition, previous findings of past inspections will be addressed in terms of changes since the 2000 inspection.


This report was developed in accordance with the requirements of the ASME Boiler and Pressure Code, 1998 Edition, Section XI, Division 1, Subsection IWL as required and modified by NRC, Code of Federal Regulation, Title 10, Part 50, Section 55a, “Codes and Standards,”(10CFR50.55a – 1999). This inspection satisfies the requirements of the above code, as outlined in ENN-EP-S-003, Rev. 0, “IWL Visual Containment Inspection,” references 7.2.1 and 7.4.4, respectively.

## 2.0 Background

The Indian Point Unit 2 Nuclear Power Plant, located in Buchanan, New York is operated by Entergy Nuclear Northeast, formerly by Consolidated Edison. The Indian Point Unit 2 Nuclear Power Plant is a 1025(plus)-Megawatt electric, Westinghouse design, four-loop pressurized water reactor that was placed into commercial operation in August, 1974.

The containment structure is a reinforced concrete vertical cylinder with a flat base and a hemispherical dome. A welded steel liner is attached to the inside face of the concrete shell to ensure a high degree of leak tightness. The cylinder consists of a side wall measuring 148 feet from the basemat to the springline of the dome, and has an inside diameter of 135 feet. The sidewalls of the cylinder are 4’-6” thick, and the hemispherical dome is 3’6” thick. The structure is supported by a 9 ft. thick basemat, which rests directly on bedrock.

The original design of the containment preceded the issuance of ASME Section III, Division 2. As a result, the reinforced concrete primary containment was designed and constructed to the requirements of the American Concrete Institute, Building Code Requirements for Reinforced Concrete, ACI 318-63.

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### 3.0 Details

#### 3.1 Qualification of Personnel

All of the inspections were performed under the direction of the IWL Responsible Engineer (RE). The RE is the Civil/Structural Design Engineering Supervisor at IPEC and a New York State Registered Professional Engineer in accordance with IWL Procedure. The Responsible Engineer has knowledge of the Design and Construction Codes as well as other criterion used in IP2's Containment.

Responsible Engineer (RE) met or exceeded the following minimum qualifications:

- Knowledgeable or trained in the design, evaluation and performance requirements of structures,
- Degreed Civil/Structural Engineer,
- 10 years minimum related experience with a post-graduate degree and registered PE license.


Inspection Engineers were members of the Civil/Structural group and met or exceeded the following minimum qualifications:

- Knowledgeable or trained in the design, evaluation and performance requirements of structures,
- Qualified to perform visual examination either directly or remotely, with adequate illumination, to detect evidence of degradation.

Degreed engineers from the Civil Structural group performed the inspections under the direction of the RE. These engineers are knowledgeable and trained in the design, evaluation and performance requirements of structures and qualified to perform visual examination either directly or remotely, with adequate illumination, to detect evidence of degradation. All inspectors met the above requirements and their resumes and inspection qualifications are attached in section 8.4. A QA inspector with VT-1 qualification was present at all times during the inspection. The walk-down team noted the conditions of structures. Areas of specific interest were photographed.

#### 3.2 Qualification of Equipment

During the containment inspection movable tripod binoculars were used in bright daylight and shade. Indoors, existing building lighting was augmented with hand held portable spotlights exceeding 55 foot-candle at 20 feet focused on the required area under examination. The portable lights were fully charged before each use and never operated longer than four hours straight. The acuity achieved met and exceeded the requirements of Section XI Table IWA-2210-1 for visual examinations and therefore were acceptable to be used for General Visual Containment inspections.

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The equipment used was able to detect fine cracks and determine details of the surface from all vantage points.

Equipment used:

- Celestron 20x80 Giant Binoculars, No. 990176
- Streamlight (Litebox), Serial No. 037510
- Illuminance Meter DLM2, ID. No. IP3M-0619-0001
- Vulcan Dual Filament Lantern, Serial Number 043975

The Celestron 20x80 Giant Binoculars was field tested on May 5, 2005 at a distance of 210 feet using a neutral gray card in natural light. This test was witnessed by Mark Gettlemen, Dragos Nuta, and Paul Bowe and achieved the acuity listed in IWA Table 2210-1 VT-3. The Vulcan Dual Filament Lantern and the Streamlight (Litebox) was measured on May 18, 2005 and June 1, 2005, respectively, by Mark Gettlemen and Dragos Nuta.

### 3.3 Accessible/Inaccessible Areas


The inspections were performed directly inside buildings, which are adjacent to the Containment Building and from the exterior using remote visual inspections. The location of the observation points is listed and shown in Figure 1. The equipment used enabled the inspectors to see the entire containment building with the exception of a small portion at the top of the dome. The entire top of the containment building dome was visible from the top of the IP1 stack, with the exception of a small wedge shape section on the NE side behind the Plant vent. The sides and slope of the dome were visible from the lower ground locations. The only portions that were inaccessible are the small wedge on top of the dome, attachment points between buildings, buried sections, and the sections behind the plant vent. The results of the inspections did not find anything that would warrant exploration of the inaccessible areas. The inaccessible areas are identified on drawing 320792 in Section 8.1.

### 3.4 Acceptance Standards

The RE and inspectors found no indications exceeding the screening criteria listed in the IWL procedure; therefore no further evaluations were required for accessible or inaccessible areas.

### 3.5 Evaluation of Results

The Responsible Engineer reviewed the inspection checklists/notes and assessed the current condition of the structures. All defects were evaluated for their effect on the structure based on the applicable ACI, AISC, ASME Section XI, and NY State

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Building Codes. References 7.3.2 and 7.3.3 were used to evaluate any flaws, indications, or degradation.

The condition of structures are classified into one of the following:

Acceptable – Acceptable structures are capable of performing their structural functions, including protection or support of safety-related systems or components. Acceptable structures are free of degradation, which could lead to possible failure.

Acceptable with Deficiencies – Structures that are acceptable with deficiencies are capable of performing their structural functions, including the protection or support of safety-related systems or components. The deficiencies (degradation) are acceptable, but need monitoring.

Unacceptable – Unacceptable structures are those which are degraded such that they are not capable of performing their structural functions, including the protection or support of safety-related systems or components.


### 3.6 Report Comparison

In 2000 IWL Concrete Containment inspection report prepared by Sargent & Lundy, the Containment was divided into six zones around the circumference established to coincide with vertical boundaries drawn from the location of the six lightning arrestors. Within every one of the six zones, Sargent & Lundy observed sub-zones delineated by the bottom and top elevation of the segment. Every one of the sub-zones was given a component number. The number of sub-zones thus established was 47. Zone 7, and Component number 48, are represented by the segment at the very top of the containment dome.

This report maintains the number of segments in that there are 48 components that correspond to the 48 components covered by the 2000 IWL report. It should be noted that while the 2000 IWL report presents the inspection results for zones that list the bottom elevation of the segment and the zone the segment is located in, such as IWL-043-002 meaning a segment in Zone 002 starting at Elevation 043', the 2005 report listed the zone and the bottom and top elevations of the segment. As such, segment IWL-043-002 is equivalent in the 2005 report to the segment given as Zone 002, Elevation 43' to Elevation 68'. In both cases, the Component Number is VCC - 05.

### 4.0 Operating Experience

The following are two examples of the Operating Experience throughout the industry, in regards to IWL Containment inspections:

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#### 4.1 OE12772 - North Anna

##### Inspection of North Anna Containment Concrete Structures Identifies Embedded Wood

###### Abstract:


During a required visual inspection of the U-1 and U-2 containment structures, several pieces of wood were discovered embedded in the concrete. To date, three pieces of wood have been discovered from the external visual inspection of Unit 1, and one piece in Unit 2. The wood was most likely part of the forms used during the initial construction of the units. Based on an evaluation of the defects and the design of the containment structure, structural integrity of the containment has not been compromised.

#### 4.2 Event Number: 280-010730-1, Surry 1

Event Date: 7/30/2001, INPO Change Date 06/03/2002, Unit: 280, Surry 1  
Event Title: Embedded Material in the Containment Structures

###### Event Summary:

During July and August, 2001, detailed inspection of both Surry Unit 1 and Unit 2 containment exterior concrete was conducted for the ASME Section XI, IWL base line inspection. Augmented detailed inspections of the containment dome areas were conducted during refueling outages, Unit 1 in November 2001 and Unit 2 in April 2002. The purpose of the inspections was to verify that no significant degradation of the containment concrete had occurred and to recommend actions necessary to prevent further degradation. The earlier detailed inspections of the containment concrete exterior resulted in finding numerous small cavities resulting from entrapment of air bubbles in the surface of formed concrete during placement and consolidation and numerous hairline cracks typical of concrete vessels subjected to elevated internal pressure testing. Minor surface defects were identified for future repair. During the augmented inspections in the refueling outages, small sections of dimensional lumber, debris, and wood chips were extracted from the containment dome areas, and the areas were patched. Three findings resulted in exposing the underlying reinforcing steel. The first involved repair of a spalled area down to sound concrete when a six inch long section of two by four lumber was found to extend into the structure past the reinforcing steel. The second was a five foot by three foot area of concrete that was missing the mortar and contained only coarse aggregate that extended sixteen inches into the structure. The third area involved a single reinforcing bar found without sufficient concrete cover. Repairs were made during the augmented inspection. Each of these areas was evaluated and found not to

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have adversely affected the ability of the containment structures to perform their design function. The containment structures were generally found to be in good material condition. The interface between the containment structure and grade was inspected with no findings. The interface between adjacent building slabs and the containment structure was inspected with no findings. The interfaces with adjacent structures were inspected with no findings. Embedded material had been cast into the containment structures during original plant construction. The slight depression of the wood below the adjacent concrete indicated that the wood was likely concealed below a thin layer of cement paste immediately following removal of the concrete formwork. Over time this thin layer of concrete has spalled off, leaving the wood exposed. This event is not significant because the containment structures for both units were capable of performing their design function. This event is **NOTEWORTHY** because three areas were found not to have sound exterior concrete covering the reinforcing steel.


## 5.0 Summary of Results

This inspection was to identify signs of structural degradation and identify the required Repairs and/or Replacement activities to minimize degradation due to environmental conditions and aging. The inspection performed was a general visual examination. No further examinations were required. The summary of the field comments for the inspections are documented in Attachment 8.2. The inspection was performed using optical equipment with Zoom capability. The pictures shown in Attachment 8.3 were taken with a digital camera with inferior zoom capabilities. Therefore, the pictures do not show the same detail at which the examinations were performed.

The Vapor Containment (VC) building has typical concrete conditions over the surface of the structure. Expected minor cracking appears throughout the concrete surface due to the pressurization of the VC, along with numerous bugholes. Large areas of rust staining were visible under all six lightning arresters, and around the duct. Clearly, the rust staining comes from the lightning arresters and the metal from the duct and has no significant influence on the concrete containment. Also, several locations with visible leaching were found. The leaching, for the most part, appears to have remained unchanged since the previous inspection, therefore categorizing the areas as in-active.

Prior to the initiation of the concrete inspections performed by Sargent & Lundy in 2000, Raytheon Engineers and Constructors was contracted to develop a report containing the visual acceptance criteria for the in-service inspection of the IP2 concrete containment structure. The report was issued as Report No. 91450.044-S-001. Included in the report are the margins available in the existing concrete reinforcing steel to resist the design basis forces and moments when compared to the



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allowable code stresses. Reflecting the variations in the actual stresses and resulting margins within the reinforcing steel at various locations in the containment structure, the Raytheon evaluation divides the containment into three distinct zones:

- **Red Zone:** Areas where small margin exists in the existing rebar. This area is located in the cylinder portion of the containment near transition areas such as the equipment hatch, personnel air lock, large mechanical/electrical penetrations and the intersection of the containment cylinder to the base-mat.
- **Green Zone:** All areas in the cylindrical portion of the containment structure with the exception of the areas contained in the red zone. The reinforcing steel in this zone contains large margins and concrete irregularities such as cracking and spalling can be tolerated in this region.
- **Yellow Zone:** Dome portion of the containment. This area also has large margins for the reinforcing steel and can tolerate concrete irregularities such as cracking and spalling. The difference between the yellow and green zones is the amount of available margins. The yellow zone has slightly less margin than the green zone.


A review of the 2005 IWL Recordable Indications, which numbered 91, vis-a-vis the Raytheon report, resulted in the conclusion that none of the 91 indications represent structural concerns for the concrete containment structure. Also, none of these indications reduce the structural capacity or ability of the containment structure to perform its safety function. Some of the considerations made, which also reflect material developed in conjunction with the 2000 IWL inspection, are as follows:

- Some corrosion was exhibited for all of the situations where rebar and/or cadwelds were exposed to the environment as a result of concrete spalling. Cadwelds are heavy walled cylinders used to splice together two pieces of rebar. Molten metal is injected into the cadweld cylinder to fuse together the two ends of rebar. These splices typically have a diameter twice that of the rebar they are joining. No flaking or aggressive corrosion processes were observed. The exposed areas of cadweld splices and reinforcing steel were in the approximately 4 inches by 3 inches tall range, with some of them larger, such as the 9" x 3" exposed Cadweld in Zone 001, Component VCC-04 (See Comment 1 on Page 10 of 138, and Photo U2-015102), and the exposed 8" x 3" Cadweld in Zone 004, Component VCC-15 (See Comment 7, and Photo U2-045126).
- Of the 48 components inspected during the IWL examination of the concrete containment structure, only Components VCC - 01, 02, 04, 05, 06, 11, 15, 16, 17, 22, and VCC - 23 are within the "red zone," as described above.


A comparison of the 2000 IWL observations versus the 2005 IWL observations for these zones is presented below:



No.	Zone	Elevation Range (Feet)	Component Number	2000 Observations	2005 Observations
1	001	034 to 043	VCC- 01	Minor leaching from patch at top of mat.	Unchanged since 2000 inspection.
2	001	043 to 068	VCC- 04	Non-uniformity of surface color/texture. 20' long leaching. Leaching from 9" dia. Patch at top of basemat junction to wall. 9" x 3" spall exposing cadweld.  Vertical rebar exposed 9" or less at 10 locations over 20' width at basemat junction.  Ribs of steel and steel scrap exposed.  Form tie hole partly filled or not filled.	Non-uniformity of surface color/texture. Unchanged leaching .  Exposed cadweld over 9" x 3"has additional spalling since 2000. Vertical rebar exposed 9" or less at 10 locations over 20' width at basemat junction remained unchanged; some spontaneous pitting appeared not present in 2000. Exposed scrap steel now has a 6" crack (< 1/4"). Ribs of embedded steel the same; but additional pitting appeared. Form tie holes unchanged since 2000.
3	002	034 to 043	VCC- 02	NRIs include honeycomb and flaking/peeling coating.	Abrasion below top of mat (not significant). Same honeycombing and flaking/peeling of coating.
4	002	043 to 068	VCC- 05	10" long spall at floor level next to pen. MP-H.(Honeycomb from original placement). Crack with delamination nearby pen. MP-G. 18" wide x 12' high delamination at Elev. 49 below pen. MP-F.	Everything stayed the same as in 2000. A 3/4" rebar sticks out with rust and stain at El. 46. behind Rack 15 (non-structural)
5	003	043 to 068	VCC- 06	2 exposed cadwelds with slight corrosion but no staining visible. 2' dia. Surface defect + tie holes.	Everything stayed the same as in 2000. New: Caulking covering a possible crack over a length of 10' observed.
6	004	068 to 088	VCC- 11	NI	Joint cracking over 10' length, general pattern cracking, joint spall over 3' length at El. 80', leaching from a popout.
7	004	088 to 108	VCC- 15	2' long leaching,  8" square concrete spall ready about to pop out, rebar exposed in 4" spall,  10" x 4" spall exposing 8" cadweld.	Popout 3" long, rusted rebar at El. 105. 2" long leaching-unchanged since 2000. 8" square concrete ready to spall in 2000 has 4" popout; rusted rebar at El. 104'. 10" x 4" spall exposing 8" cadweld. Since previous inspection, minor additional spalling has occurred, with some rust streaks and staining
8	005	088 to 108	VCC-16	NI; Non-uniformity of surface color/texture.	2" popout from form ties. Non-uniformity of surface color/texture.
9	005	108 to 128	VCC- 22	NI; Non-uniformity of surface color/texture.	NI; Non-uniformity of surface color/texture.
10	006	088 to 108	VCC- 17	NI; Non-uniformity of surface color/texture.	8' long crack + pattern cracking. Non-uniformity of surface color/texture.
11	006	108 to 128	VCC- 23	NI; Non-uniformity of surface color/texture.	NI; Non-uniformity of surface color/texture.

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- For Component VCC- 01, Inspection Zone 001, from 034' to 043', there were no Recordable Indications.
- For Component VCC- 04, Inspection Zone 001, from 043' to 068', most of the 2000 findings remained unchanged except for minor additional spalling that is not considered significant.
- For Component VCC- 02, Inspection Zone 002, from 034' to 043' the only change is the insignificant abrasion observed on the side of the foundation mat.
- For Component VCC- 05, Inspection zone 002, from 043' to 068', everything stayed the same when compared to the 2000 inspection. The ¾" diameter reinforcing steel projecting out of the containment wall behind Rack 15, which also displays some rust and staining is not a structural bar and has no structural significance.
- For Component VCC- 06, Inspection Zone 003, from 043' to 068', there were no changes since the 2000 inspection. Caulking over a length of 10 feet, not recorded during the 2000 inspection, and considered to be covering a potential crack, was observed. If the caulking covered a crack, the crack would not be structurally significant.
- Component VCC- 15, Inspection zone 004, from 068' to 088', is "marginally" located in the red zone and contains exposed steel that appears to represent cadweld splices. The exposed cadweld splices are located in the upper end of the inspection zone which borders the green stress zone. Based on the corrosion evaluation performed by Raytheon in their acceptance criteria report, ongoing corrosion for 40 years would only result in a decrease of 10% in the reinforcing steel cross-section. Since these indications are located on the border between the red and green stress zones, sufficient margins exist in the reinforcing steel in the green zone to allow for redistribution of forces if required. In addition, the location of these indications is removed from the personnel air lock penetration which was the main area of concern in the Raytheon acceptance criteria report. While some additional spalling occurred since the 2000 IWL inspection, as mentioned under Comments 4 and 5 on Page 50 of 138, Zone No. 004, and Component No. VCC-15, no significant loss of wall section was observed by the inspection team for the exposed cadweld splice in this area. As such, no further analyses of the indications are warranted.
- For Component VCC – 16, Inspection Zone 005, from 088' to 108', a 2" diameter popout from a form tie location was noted in 2005. The 2" popout is not structurally significant.
- For Component VCC – 22, Inspection Zone 005, from 108' to 128', there were no changes from the 2000 IWL inspection.
- For Component VCC – 17, Inspection Zone 006, from 088' to 108', an 8' long horizontal crack was noted at Elevation 91'. Also, additional pattern

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cracking was noted in the area of the Equipment Hatch. Cracking in the Equipment Hatch discontinuity area is fully expected when considering the ILRT pressurization. The cracks are not significant in terms of the concrete containment structural integrity.

- For Component VCC – 23, Inspection Zone 006, from 108' to 128', there were no changes from the 2000 IWL inspection.
- The remaining IWL inspection zones with exposed steel are located in the green and yellow stress zones as defined in the Raytheon acceptance criteria report. Per the Raytheon acceptance criteria report, for indications in the green and yellow stress zones, the maximum postulated reduction in reinforcing steel cross-section based on 40 years of corrosion will not result in any overstress conditions in the reinforcing steel. As a result, corrosion of reinforcing steel in the green and yellow zones due to spalling or cracking of concrete will not affect the structural integrity of the containment structure.
- Of the total Recordable Indications, a large majority include findings concerning exposed cadweld splices and concrete related findings. These findings are primarily isolated conditions and not grouped in any one location. In addition, and as mentioned earlier, the total area of exposed cadweld splices were very small, each being approximately four inches by three inches, when compare to the total surface area of the containment structure.


Reiterating statements made in the 2000 IWL report, the apparent cause for the observations noted are as follows:

- Normal concrete weathering over the approximately 27 years of exposure to the elements.
- The inherent non-homogeneous material property of concrete.
- Insufficient concrete cover. The spalling observed which exposed the cadweld splices were most likely caused by insufficient cover. This is due to the large diameter of the cadweld splices, which are approximately twice that of the reinforcing steel.

All of the observations/findings resulting from the IWL inspection will be monitored as required by the IWL portion of ASME code to document and track any potential changes to the observations noted.

## 6.0 Conclusion

The Containment Structure remains fully capable of performing its design functions. **The Concrete Containment is Acceptable with Deficiencies** in accordance with ASME Section XI IWL. The IWL components and structures are capable of performing their structural functions, including protection or support of safety-related systems or components. The components and structures are free of degradation

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which could lead to possible failure. At this time, there is no need for any condition reports or work orders to be created.

## 7.0 Reference Material

### 7.1 Definitions

Containment: The composite structure that serves as a leak-tight barrier that supports the load of the inside pressure in the event of a reactor coolant or steam system leak and prevents the uncontrolled release of radioactivity to the environment under normal and postulated accident conditions.

Accessible Areas: Those areas of the containment pressure retaining surface, including integral attachments, that can be examined directly or remotely without installation of temporary means (i.e.: scaffolding or ladder) to accomplish the examination.

Inaccessible Areas: Those areas of the containment pressure retaining surface, including integral attachments that cannot be examined directly or remotely due to permanent obstruction (i.e.: Embedment in concrete, interference of plant equipment or structures).


General Visual Examination: A visual examination performed either directly or remotely to assess the general condition of the accessible containment surfaces and to detect evidence of degradation that may affect structural integrity or leak tightness.

Structural Integrity: The ability of a structure or component to withstand prescribed design loads.

Evaluation: The process of determining the significance of examination or test results, including the comparison of examination or test results with applicable acceptance criteria or previous results.

Cracks: A complete or incomplete separation, of either concrete or masonry, into two or more parts produced by breaking or fracturing. The different types (e.g.: pattern, checking, hairline, D-cracking) of cracking are illustrated by photographs in ACI 201.1R-68 (see Figures A.1.1a-h, A.1.2a-c, A.1.3, and A.1.5).

Cracking of the concrete cover is a common mechanism for any concrete structure. This condition is normally a result of normal expansion and contraction, which occurs within the concrete due to variations in temperature and stress.

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Passive Cracks observed in the concrete cover are acceptable for continued service and do not warrant a review by the IWL Responsible Engineer. Passive cracks are defined as those having an absence of growth (when compared to the baseline examination results) and absence of other degradation mechanisms at the crack (e.g.: bulging caused by corrosion buildup).

Distortion: Any abnormal deformation of concrete from its original shape. This condition is illustrated by photograph in ACI 201.1R-68 (see Figure A.2.2).

Distortion of the concrete structure would be a result of abnormal loading conditions (e.g.: earthquake, water hammer) and the damage would be primary concentrated in the concrete cover. However, internal structural degradation may be possible.

Efflorescence (Leaching): A deposit of salts, usually white, formed on a surface, the substance having emerged from below the surface. This condition is illustrated by photograph in ACI 201.1R-68 (see Figure A.1.1.g).


Efflorescence (also referred to as leaching) is caused by exposure of the concrete to flowing or penetrating water that results in the leaching of certain salts, including calcium hydroxide, for the concrete paste. This condition normally occurs at locations of high moisture penetration and flow, such as cracks.

Popout: The breaking away of small portions of a concrete surface due to internal pressure which leaves a shallow, typical conical depression. This condition is illustrated by photographs in ACI 201.1R-68 (see Figures A.2.7, A.2.7.1, A.2.7.2, and A.2.7.3).

Scaling (including peeling): Local flaking or peeling away of the near surface portion of concrete or mortar. Scaling may be loss of coarse aggregate particles as well as mortar. This condition is illustrated by photographs in ACI 201.1R-68 (see Figures A.2.9.1a & b, A.2.9.2a & b, A.2.9.3a & b, A.2.9.4a & b, and A.2.9.5a & b).

Spall: A fragment, usually in the shape of a flake, detached from a larger mass by a blow, by the action of weather, by pressure, or by expansion within the large mass. A spall is normally a circular or oval depression or in some cases elongated depression over a reinforcing bar. This condition is illustrated by photographs in ACI 201.1R-68 (see Figures A.2.10.1, A.2.10.2, and A.2.11.a & b).

Corrosion: Disintegration or deterioration of concrete or reinforcement by electrolysis or by chemical attack. This condition is illustrated by photograph in ACI 201.1R-68 (see Figure A.2.16).

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7.2 References: Commitment Documents


- 7.2.1 Code of Federal Regulations; Title 10, Energy; Part 50, Domestic Licensing of Production and Utilization Facilities; Section 50.55a, Codes and Standards
- 7.2.2 Code of Federal Regulations; Title 10, Energy; Part 50, Domestic Licensing of Production and Utilization Facilities; Appendix J, Primary Containment Leakage Testing for water-cooled Power Reactors
- 7.2.3 Regulatory Guide 1.147, Revision 12, Inservice Inspection Code Case Acceptability, ASME Section XI, Division 1
- 7.2.4 USNRC NUREG-1522, Assessment of Inservice Conditions of Safety-Related Nuclear Plant Structures
- 7.2.5 USNRC Inspection Manual, Inspection Procedure 62003, Inspection of Steel and Concrete Containment Structures at Nuclear Power Plants
- 7.2.6 USNRC IN 97-11, Cement Erosion From Containment Sub-foundations at Nuclear Power Plants
- 7.2.7 USNRC IN 97-29, Containment Inspection Rule

7.3 References: Development Documents

- 7.3.1 ASME Boiler and Pressure Vessel Code, Section XI, Subsections IWE/IWL 1998 Edition, No Addenda
- 7.3.2 ACI 201.1R-92, Guide for Making a Condition Survey of Concrete In-Service
- 7.3.3 ACI 349.3R-96, Evaluation of Nuclear Safety-Related Concrete Structures
- 7.3.4 Sargent & Lundy, "Containment Inservice Inspection First Period Examinations," March 2000 – June 2000.

7.4 References: Interface Documents

- 7.4.1 IP-C-01 "Installation Procedure for Concrete Repairs"

	<b>IPEC</b>	IP-RPT-06-00019	REV. 0
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	IP2 ASME Section XI, IWL Concrete Containment Inspection for 2005		

7.4.2 FCX-97-C-002, "Maintenance Rule Structural Monitoring Program for Indian Point 2."

7.4.3 EN-DC-147, Rev. 0, "Engineering Reports"

7.4.4 ENN-EP-S-003, Rev. 0, "IWL Visual Containment Inspection"

7.4.5 Report No. 91450.044-S-001, "Design Margins of the IP2 Containment Steel Liner," Raytheon Engineers and Constructors.

7.5 References: Containment ISI Drawings

7.5.1 320792-00, "Containment ISI Concrete Layout."

7.5.2 320793-00, "Containment ISI Concrete Dome."

7.5.3 320785-00, "Containment ISI General Arrangement."

8.0 Attachments


Attachment 8.1 Figures and Drawings

Attachment 8.2 Findings Summary

Attachment 8.3 Inspection Reports

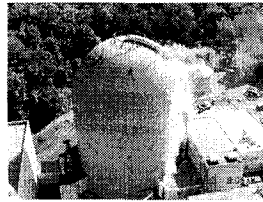
Attachment 8.4 Qualification & Resumes



	<b>IPEC</b>	IP-RPT-06-00019	REV. 0
		Page 1 of 5	
	IP2 ASME Section XI, IWL Concrete Containment Inspection for 2005		

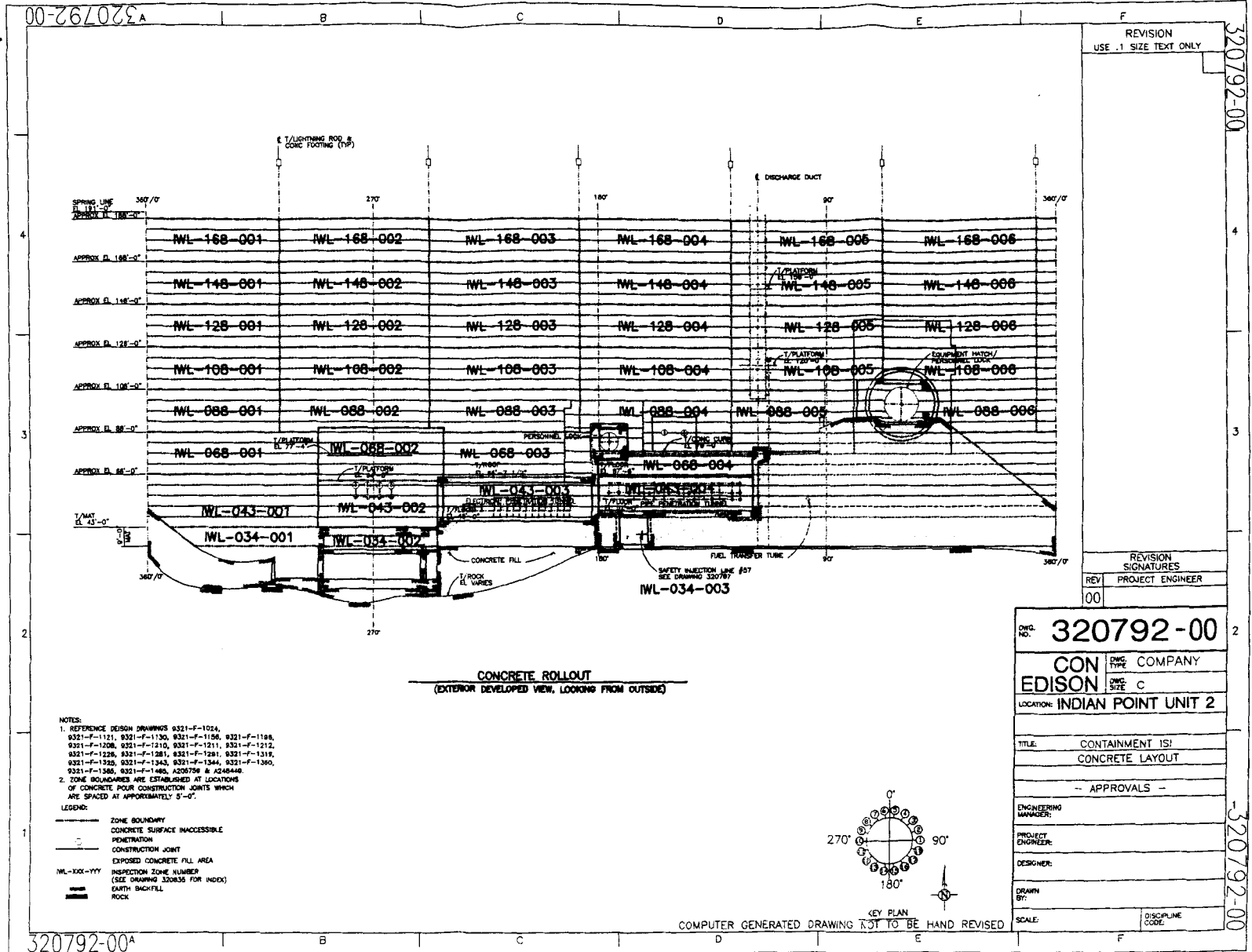
**Indian Point 2  
Nuclear Power Plant**

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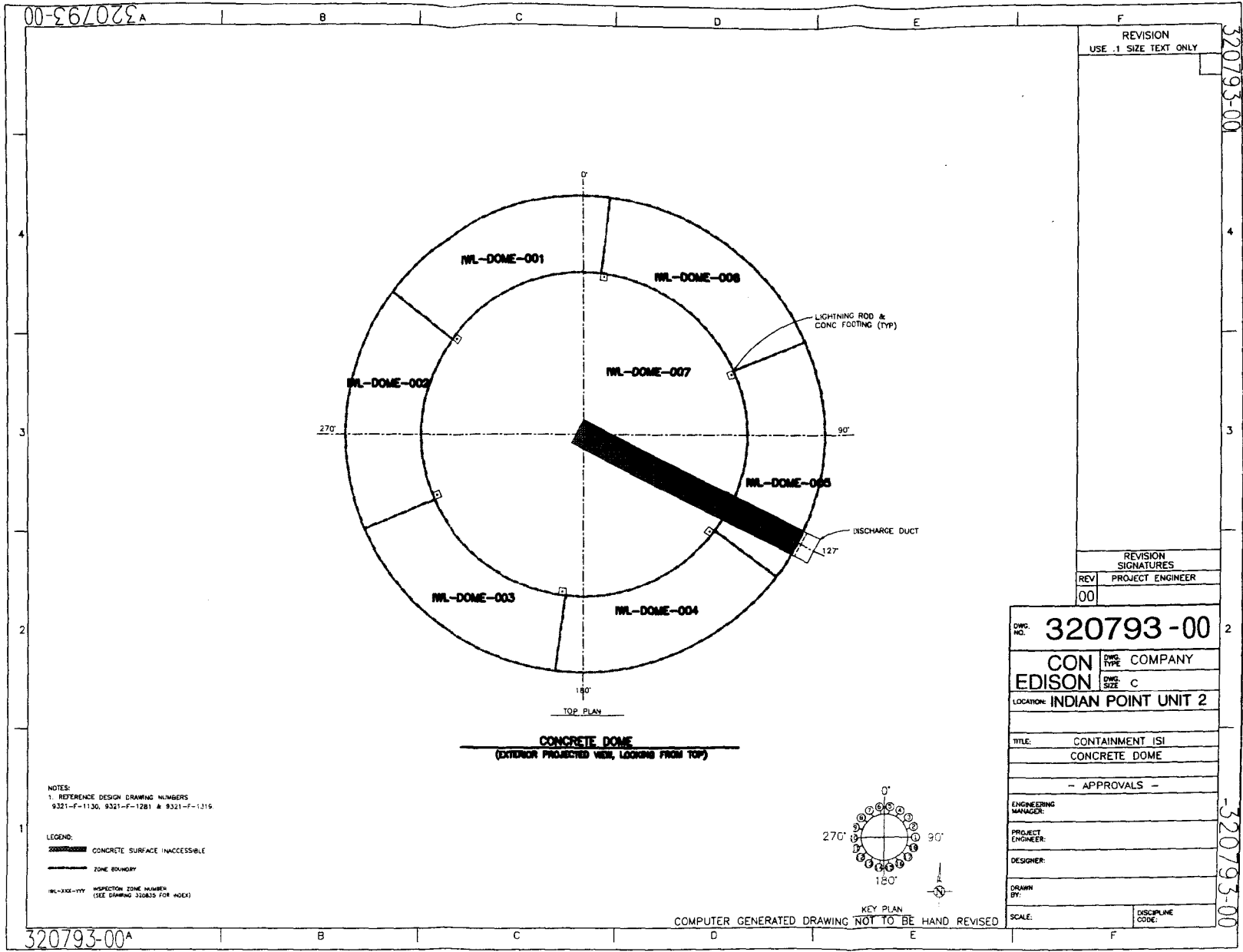


**ATTACHMENT 8.1  
FIGURES AND DRAWINGS**

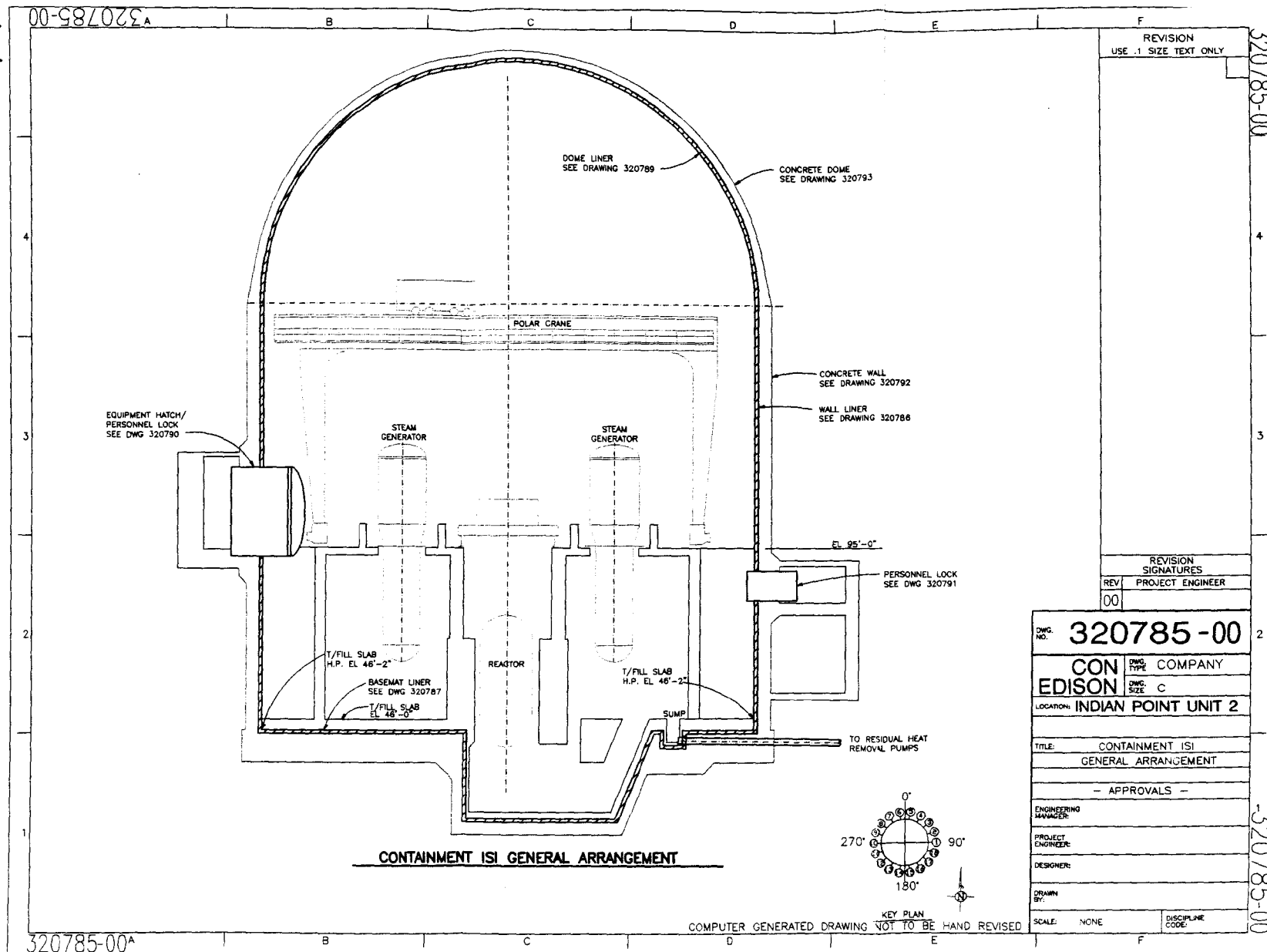





IPCC00194193



IPEC00194194



IPEC00194195

	<b>IPEC</b>	IP-RPT-06-00019	REV. 0
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**Indian Point 2  
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**ATTACHMENT 8.2  
FINDINGS SUMMARY**

**FINDINGS SUMMARY:**
**INSPECTION #: IP2-05-IWL-001**

ZONE NUMBER	ELEVATION	ACCEPTABLE	ACCEPTABLE WITH DEGR.	UNACCEPTABLE	REMARKS
001	34' - 43'	X			
002	34' - 43'		X		Area of abrasion exposing aggregate with some leaching.
001	43' - 68'		X		Exposed rusted steel and leaching.
002	43' - 68'	X			
003	43' - 68'	X			
004	43' - 68'		X		2" diameter spall.
001	68' - 88'	X			
002	68' - 88'		X		Joint cracking and spalling exposing aggregate.
003	68' - 88'	X			
004	68' - 88'	X			
001	88' - 108'	X			
002	88' - 108'	X			

**FINDINGS SUMMARY:**

**INSPECTION #: IP2-05-IWL-001**

ZONE NUMBER	ELEVATION	ACCEPTABLE	ACCEPTABLE WITH DEGR.	UNACCEPTABLE	REMARKS
003	88' - 108'	X			
004	88' - 108'		X		Exposed rebar and cadweld, spalls, and popouts.
005	88' - 108'	X			
006	88' - 108'	X			
001	108' - 128'	X			
002	108' - 128'		X		Exposed cadweld (approx. 9" long) has remained unchanged since previous inspection.
003	108' - 128'		X		Exposed cadweld with rust and staining (approx. 8").
004	108' - 128'		X		Exposed rebar due to spalling.
005	108' - 128'	X			
006	108' - 128'	X			
001	128' - 148'		X		Exposed rebar with rusting and staining.
002	128' - 148'		X		Exposed cadweld with rusting and staining.
003	128' - 148'	X			




**FINDINGS SUMMARY:**
**INSPECTION #: IP2-05-IWL-001**

ZONE NUMBER	ELEVATION	ACCEPTABLE	ACCEPTABLE WITH DEGR.	UNACCEPTABLE	REMARKS
004	128' - 148'	X			
005	128' - 148'	X			
006	128' - 148'	X			
001	148' - 168'		X		Exposed cadwelds with rusting and staining.
002	148' - 168'		X		Exposed cadwelds with rusting and staining.
003	148' - 168'	X			
004	148' - 168'	X			
005	148' - 168'	X			
006	148' - 168'		X		Exposed steel from spalling.
001	168' - 188'	X			
002	168' - 188'		X		Exposed steel due to popouts and spalls.
003	168' - 188'		X		Areas of spalling, exposing rebar.
004	168' - 188'	X			

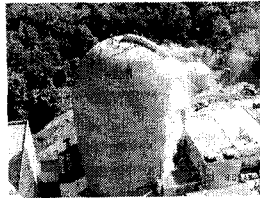
**FINDINGS SUMMARY:**
**INSPECTION #: IP2-05-IWL-001**

ZONE NUMBER	ELEVATION	ACCEPTABLE	ACCEPTABLE WITH DEGR.	UNACCEPTABLE	REMARKS
005	168' – 188'	X			
006	168' – 188'		X		Cadweld sleeve exposed with staining. 12" long efflorescence, unchanged from previous inspection.
001	DOME	X			
002	DOME	X			
003	DOME		X		Joint crack (approximately 1/4"x3'). Exposed rebar.
004	DOME	X			
005	DOME	X			
006	DOME	X			
007	DOME		X		Unidentified piece of concrete (approx. 4"x8") found on dome.


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**Indian Point 2  
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**ATTACHMENT 8.3  
INSPECTION REPORTS**

 <b>ENN NUCLEAR MANAGEMENT MANUAL</b>	<b>ENGINEERING STANDARD</b>	<b>ENN-EP-S-003 Revision 0</b>
	<b>IWL Visual Containment Inspection</b>	<b>Page 13 of 15</b>

**Attachment 7.1**

**DEMONSTRATION OF REMOTE EXAMINATION METHOD**

IPEC Unit: 2

Date: 05/09/2005

**EQUIPMENT USED:**

CELESTRON 20 X 80 GIANT BINOCULARS, No. 990176

**DESCRIPTION OF DEMONSTRATION:** (Include discussion of appropriate viewing distance, lighting condition and resolution achieved.)

The neutral gray card with 2 line markings of thickness 0.015" and 0.03" to emulate concrete cracks was held at a measured distance of 210 feet from the binoculars which were mounted on a tripod.

The weather conditions were clear, with bright sunlight.

Result: Both lines on the test card were clearly visible.

**LIMITATIONS:**

**Demonstration Performed By:**

Signature: *Mal Fother* Date: 6/2/05

**Demonstration Witnessed By:**

Signature: *Diago A. Wata* Date: 6/2/05

**Responsible Engineer Review:**


Signature: *Richard N. Seale* Date: 6/2/05

**Site Level III Review:**

Signature: \_\_\_\_\_ Date: \_\_\_\_\_

**Authorized Nuclear Inspector (ANII) Review:**

Signature: *[Signature]* Date: 4/21/06  
*Herbert*

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		IWL Visual Containment Inspection	Page 13 of 15

Attachment 7.1

DEMONSTRATION OF REMOTE EXAMINATION METHOD

IPEC Unit: 2

Date: 5/18/2005

**EQUIPMENT USED:**

Vulcan Dual Filament Lantern, Serial Number 043975.

Illuminance Meter DLM2, ID No. IP3-0619-0001, Calibration Due Date of 04/26/2006.

**DESCRIPTION OF DEMONSTRATION:** (Include discussion of appropriate viewing distance, lighting condition and resolution achieved.)

Based on an expected viewing distance of 20 feet or less for the visual examinations to be performed inside the Pipe Pen/Electrical Penetration area, and the VC penetrations inside the Aux Boiler Feed Pump Building, the demonstration proved that, using the low intensity beam, a light intensity in excess of 70 ft-candle was achieved at a distance of 20 feet using the DLM2 Illuminance Meter. The acceptable illuminance is 50 ft-candle at 20 feet. Background light intensity was in the 5 ft-candle range.

**LIMITATIONS:**

Flashlight must be charged every four hours (use restricted to four hours or less).

**Demonstration Performed By:**

Signature: *Mark Lath* Date: 6/2/05

**Demonstration Witnessed By:**

Signature: *Diagnos A. Wata* Date: 6/2/05

**Responsible Engineer Review:**


Signature: *Robert J. Walsh* Date: 6/2/05

**Site Level III Review:**

Signature: \_\_\_\_\_ Date: \_\_\_\_\_

**Authorized Nuclear Inspector (ANII) Review:**

Signature: *[Signature]* Date: 7/21/06

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Attachment 7.1

DEMONSTRATION OF REMOTE EXAMINATION METHOD

IPEC Unit: 2

Date: 6/01/2005

**EQUIPMENT USED:**

Streamlight (Lightbox), Serial Number 037510.

Illuminance Meter DLM2, ID No. IP3M-0619-0001, Calibration Due Date of 04/26/2006.

**DESCRIPTION OF DEMONSTRATION:** (Include discussion of appropriate viewing distance, lighting condition and resolution achieved.)

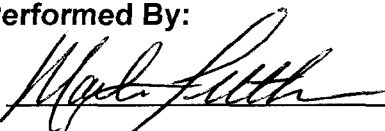
Based on an expected viewing distance of 20 feet or less for the visual examinations to be performed inside the Aux Boiler Feed Pump Building, the demonstration proved a light intensity in excess of 55-60 ft-candle was achieved at a distance of 20 feet using the DLM2 Illuminance Meter.

The acceptable illuminance is 50 ft-candle at 20 feet. Background light intensity was in the 5 ft-candle range.

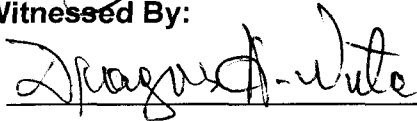
**LIMITATIONS:**

Flashlight must be charged every four hours (use restricted to four hours or less).

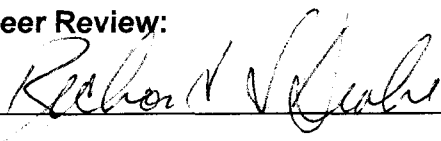
**Demonstration Performed By:**

Signature:  Date: 6/2/05

**Demonstration Witnessed By:**

Signature:  Date: 6/2/05

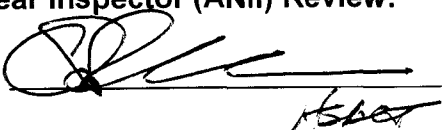
**Responsible Engineer Review:**


Signature:  Date: 6/2/05

**Site Level III Review:**

Signature: \_\_\_\_\_ Date: \_\_\_\_\_

**Authorized Nuclear Inspector (ANI) Review:**

Signature:  Date: 4/21/06

 <b>ENN NUCLEAR MANAGEMENT MANUAL</b>	ENGINEERING STANDARD	ENN-EP-S-003 Revision 0
	IWL Visual Containment Inspection	Page 14 of 15

**Attachment 7.2  
CONTAINMENT INSERVICE INSPECTION  
RECORD OF VT-3 / GENERAL VISUAL EXAMINATION**

IPEC Unit: 2 Interval Period: 1<sup>st</sup>/2<sup>nd</sup> Inspection Inspection Report No.: IP2-O5-IWL-001

Component No.: VCC - 01 Zone No: 001 Drawing No.: \_\_\_\_\_

Description: El. 34 – El. 43 Work Order No: IP2-03-29683

Equipment Used: Celestron Giant 20x80 Binoculars Limitations: Accessible areas only

Recording Condition	RI	NRI	NI	N/A	Comments
Leaching or chemical attack	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	1
Abrasion or erosion degradation	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Pop outs and voids	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Scaling	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Spalls	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Corrosion staining on concrete surfaces	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Cracks	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Exposed reinforcing steel	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Deteriorating of concrete coating, if applicable	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Excessive corrosion of the exposed embedded metal surfaces	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Detached embedment or loose bolts	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Other	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	

(Note: Sketches or pictures may be attached to clarify inspection areas and locations.)

Examined By: Mark Coleman II Date: 6/2/05 Examined By: DRAGOS NUTU Date: 6/2/05  
 Print/Signature/Level Print/Signature/Level

**Responsible Engineer Review:**

Acceptable : Yes  No  (Detailed VT-1 Examination Required Attachment 7.3)

Comments: \_\_\_\_\_

RE Signature Richard Drake Date: 6/9/05  
 Print/Signature/Level

Site Level III Review: \_\_\_\_\_ Date: \_\_\_\_\_  
 Print/Signature/Level

ANII Review: Not Applicable Date: \_\_\_\_\_  
 Print/Signature

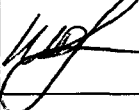
IWL VISUAL CONTAINMENT INSPECTION  
Indian Point Unit No. 2

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Rev. 0  
Date: 5/10/2005  
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**FORM VT - 3C**  
**CONTAINMENT INSERVICE INSPECTION**  
**RECORD OF VT - 3 /GENERAL VISUAL EXAMINATION**

STATION/UNIT: IPEC / Indian Point No. 2 COMPONENT NO. : VCC - 01

ZONE No: 001

No.	Comment	Initials
1	Minor area of leaching from small patch at top of mat. This area has remained unchanged since previous inspection.	



	ENN NUCLEAR MANAGEMENT MANUAL	ENGINEERING STANDARD	ENN-EP-S-003 Revision 0
		IWL Visual Containment Inspection	Page 14 of 15

**Attachment 7.2**  
**CONTAINMENT INSERVICE INSPECTION**  
**RECORD OF VT-3 / GENERAL VISUAL EXAMINATION**

IPEC Unit: 2 Interval Period: 1<sup>st</sup>/2<sup>nd</sup> Inspection Inspection Report No.: IP2-O5-IWL-001

Component No.: VCC - 02 Zone No: 002 Drawing No.: \_\_\_\_\_

Description: EI. 34 – EI. 43 Work Order No: IP2-03-29683

Equipment Used: Streamlight (Lightbox) Limitations: Accessible areas only

Recording Condition	RI	NRI	NI	N/A	Comments
Leaching or chemical attack	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Abrasion or erosion degradation	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	3
Pop outs and voids	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	1
Scaling	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Spalls	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Corrosion staining on concrete surfaces	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Cracks	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Exposed reinforcing steel	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Deteriorating of concrete coating, if applicable	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	2
Excessive corrosion of the exposed embedded metal surfaces	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Detached embedment or loose bolts	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Other	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	

(Note: Sketches or pictures may be attached to clarify inspection areas and locations.)

Examined By: MARK GENTLEMAN II Date: 6/2/05 Examined By: G. BHALLA/Component Date: 6/2/05  
 Print/Signature/Level Print/Signature/Level

**Responsible Engineer Review:**

Acceptable : Yes  No  (Detailed VT-1 Examination Required Attachment 7.3)

Comments: \_\_\_\_\_

RE Signature Richard Dak Galan Date: 6/9/05  
 Print/Signature/Level

Site Level III Review: \_\_\_\_\_ Date: \_\_\_\_\_  
 Print/Signature/Level

ANII Review: Not Applicable Date: \_\_\_\_\_  
 Print/Signature



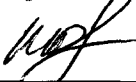
IWL VISUAL CONTAINMENT INSPECTION  
Indian Point Unit No. 2


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FORM VT - 3C  
CONTAINMENT INSERVICE INSPECTION  
RECORD OF VT - 3 /GENERAL VISUAL EXAMINATION

STATION/UNIT: IPEC / Indian Point No. 2 COMPONENT NO. : VCC - 02

ZONE No: 002

No.	Comment	Initials
1	There are several pockets of unconsolidated concrete ("honeycomb") at the very bottom edge of the mat. These areas are due to lack of proper consolidation or loss of paste during original concrete placement and do not represent degradation. This area has remained unchanged since previous inspection.	
2	There are a number of areas within this zone where the coating is flaking and peeling. There is no evidence that this is due to degradation of the concrete substrate. It is a coatings related issue and not containment degradation.	
3	Area of abrasion exposing aggregate over a 10' vertical span with some leaching just to the left. This was located just below the top of the mat and spotted from ground level behind the Aux. Boiler Feed Pump building.	

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**Attachment 7.2  
CONTAINMENT INSERVICE INSPECTION  
RECORD OF VT-3 / GENERAL VISUAL EXAMINATION**

IPEC Unit: 2 Interval Period: 1<sup>st</sup>/2<sup>nd</sup> Inspection Inspection Report No.: IP2-O5-IWL-001

Component No.: VCC - 04 Zone No.: 001 Drawing No.: \_\_\_\_\_

Description: EI. 43 - EI. 68 Work Order No.: IP2-03-29683

Equipment Used: Celestron Giant 20x80 Binoculars Limitations: Accessible areas only

Recording Condition	RI	NRI	NI	N/A	Comments
Leaching or chemical attack	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	4,5
Abrasion or erosion degradation	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Pop outs and voids	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	2
Scaling	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Spalls	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	1
Corrosion staining on concrete surfaces	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Cracks	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	3
Exposed reinforcing steel	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	1,3,6,7,8
Deteriorating of concrete coating, if applicable	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Excessive corrosion of the exposed embedded metal surfaces	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Detached embedment or loose bolts	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Other	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	7,8

(Note: Sketches or pictures may be attached to clarify inspection areas and locations.)

Examined By: MACK GENTLEMAN II Date: 6/2/05 Examined By: DRA GOS NJ TA Date: 6/2/05  
 Print/Signature/Level Print/Signature/Level

**Responsible Engineer Review:**

Acceptable : Yes  No  (Detailed VT-1 Examination Required Attachment 7.3)

Comments: \_\_\_\_\_

RE Signature Richard Drake Keller Date: 6/9/05  
 Print/Signature/Level

Site Level III Review: \_\_\_\_\_ Date: \_\_\_\_\_  
 Print/Signature/Level

ANII Review: Not Applicable Date: \_\_\_\_\_  
 Print/Signature

IWL VISUAL CONTAINMENT INSPECTION  
 Indian Point Unit No. 2

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 Rev. 0  
 Date: 5/10/2005  
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**FORM VT – 3C**  
**CONTAINMENT INSERVICE INSPECTION**  
**RECORD OF VT – 3 /GENERAL VISUAL EXAMINATION**

STATION/UNIT: IPEC / Indian Point No. 2 COMPONENT NO. : VCC – 04

ZONE No: 001

No.	Comment	Initials
1	Cadmium exposure due to spalling 9" x 3", insufficient concrete cover (less than 1/2"). Since previous inspection, additional spalling with loss of concrete has occurred. See photo U2-015102	<i>[Handwritten Signature]</i>
2	One form tie hole not filled and one partially filled. These holes have remained in the same condition since previous inspection.	<i>[Handwritten Signature]</i>
3	Scrap steel exposed at the surface. Since previous inspection, an additional well defined crack approx. 6" long and less than 1/4" wide has developed.	<i>[Handwritten Signature]</i>
4	Leaching from 9" dia. patch at top of basement at junction of wall. This area has remained unchanged since previous inspection. See photo U2-015101	<i>[Handwritten Signature]</i>
5	Leaching over a length of 20' close to joint from grout patch. This area has remained unchanged since previous inspection.	<i>[Handwritten Signature]</i>
6	Rusted bar exposed over 6" span at El. 51.	<i>[Handwritten Signature]</i>
7	Ribs of some embedded steel (scrap?) exposed at the surface at El. 44. Additional pitting has developed since previous inspection.	<i>[Handwritten Signature]</i>
8	Vertical rebar exposure with rust mark maximum 9" at 10 locations over 20' width at basement junction. This area has remained unchanged with the exception of random pitting since the previous inspection. See photo U2-015101	<i>[Handwritten Signature]</i>




U2-015101

IWL-043-001



U2-015102

IWL-043-001

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**Attachment 7.2**  
**CONTAINMENT INSERVICE INSPECTION**  
**RECORD OF VT-3 / GENERAL VISUAL EXAMINATION**

IPEC Unit: 2 Interval Period: 1<sup>st</sup>/2<sup>nd</sup> Inspection Inspection Report No.: IP2-O5-IWL-001

Component No.: VCC - 05 Zone No: 002 Drawing No.: \_\_\_\_\_

Description: EI. 43 – EI. 68 Work Order No: IP2-03-29683

Equipment Used: Streamlight (Lightbox) Limitations: Accessible areas only

Recording Condition	RI	NRI	NI	N/A	Comments
Leaching or chemical attack	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Abrasion or erosion degradation	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Pop outs and voids	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Scaling	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Spalls	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	1
Corrosion staining on concrete surfaces	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	6
Cracks	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	2,3
Exposed reinforcing steel	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	6
Deteriorating of concrete coating, if applicable	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	5
Excessive corrosion of the exposed embedded metal surfaces	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Detached embedment or loose bolts	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Other	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	

(Note: Sketches or pictures may be attached to clarify inspection areas and locations.)

Examined By: MARK GETTLEMAN II Date: 6/2/05 Examined By: GOPAL BHALLA Date: 6/2/05  
Print/Signature/Level

**Responsible Engineer Review:**

Acceptable : Yes  No  (Detailed VT-1 Examination Required Attachment 7.3)

Comments: \_\_\_\_\_

RE Signature Richard Drake Date: 6/9/05  
Print/Signature/Level

Site Level III Review: \_\_\_\_\_ Date: \_\_\_\_\_  
Print/Signature/Level

ANII Review: Not Applicable Date: \_\_\_\_\_  
Print/Signature

IWL VISUAL CONTAINMENT INSPECTION  
Indian Point Unit No. 2

IP2 - CISI - XXX  
Rev. 0  
Date: 5/10/2005  
Page: X of Y

**FORM VT - 3C**  
**CONTAINMENT INSERVICE INSPECTION**  
**RECORD OF VT - 3 /GENERAL VISUAL EXAMINATION**

STATION/UNIT: IPEC / Indian Point No. 2 COMPONENT NO. : VCC - 05

ZONE No: 002

No.	Comment	Initials
1	A spalled area approximately 10" long was found at the floor line directly below penetration MP-H. This area appears to have some unconsolidated concrete ("honeycomb") from the original placement of the concrete. This area has remained unchanged since previous inspection. See photo U2-026011	WJF
2	A crack with apparent delamination was found around the lower left edge of penetration MP-G. This area has remained unchanged since previous inspection. See photo U2-026012	WJF
3	A delamination was found at approx. El. 49' directly below penetration MP-F. The area was estimated to be 18" wide by 12" high by sounding the concrete (tapping the surface with a metal object). This area has remained unchanged since previous inspection. See photo U2-026013	WJF
4	This area was examined from the floor level at El. 43'. The examination distances were a maximum of 20 feet. While this distance exceeds the limits for direct visual examination, it was too short for use of the binoculars due to their minimum focal length. Lighting levels using the flashlight exceeded the 50 foot-candle requirement. The upper 5 feet of this zone were not visible for inspection by direct line of sight due to piping and structural steel obstructions. Area has been coated.	WJF
5	There are a number of areas within this zone where the coating is flaking and peeling. There is no evidence that this is due to degradation of the concrete substrate. It is a coatings related issue and not containment degradation.	WJF
6	Rebar sticking out (roughly 3/4" dia. bar) with rust and staining at El. 46 behind Rack 15.	WJF





U2-026011

IWL-043-002



U2-026012

IWL-043-002



U2-026013

IWL-043-002