



CALCULATION COVER SHEET

Project Victoria County Station		Job No. 25352	Calc. No. 25352-000-M0C-HARA-00003		Sheet 1 of 50	
Subject Radiological Impacts of Normal Operation for ESP					Discipline	Mechanical
Calculation Status Designation	Preliminary <input type="checkbox"/>	Confirmed with Preliminary Information <input type="checkbox"/>	Confirmed <input checked="" type="checkbox"/>	Superseded <input type="checkbox"/>	Voided <input type="checkbox"/>	
Computer Program/Type	SCP <input type="checkbox"/>	Program No. See below	Version/Release	Operating System Microsoft Windows XP Professional		
Nuclear Quality Classification	Safety-Related <input type="checkbox"/>	Augmented Quality <input checked="" type="checkbox"/>	Nonsafety-Related <input type="checkbox"/>			

Computer programs used:

- LADTAP II, Revision JSB PC – February 1996
- GASPAR II, Revision JSB PC – March 1994

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This calculation has been reviewed by Bechtel Power Corporation and any proprietary information has been removed. Wherever proprietary information has been removed, the statement "[Proprietary Information Deleted]" has been inserted.

004	Change in quality classification	128	C-53	SJ	PJB	ATV/DCP	6/9/11
003	Increase in thyroid dose for the site	128	C-53	SJ	PJB	ATV/DCP	4/22/11
002	Addition of revision description	128	C-53	SJ	PJB	ATV/ACC	6/8/10
001	Incorporation of client comments	128	C-53	SJ	DW	ATV/SWK	2/18/10
000	Initial issue	127	C-53	SJ	PJB	ATV/ACC	12/8/09
Rev. No.	Reason for Revision	Total No. of Sheets	Last Sheet No.	By	Checked	Approved/ Accepted	Date

Record of Revisions

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CALCULATION SHEET REVISION CONTROL FORM

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Calc No. 25352-000-MOC-HARA-00003
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Sheet Rev 004

Subject Radiological Impacts of Normal Operation for ESP

By S. Jha Chkr P. J. Babel Date 6/8/11

Sht.	Latest Rev.	Sht.	Latest Rev.	Sht.	Latest Rev.	Sht.	Latest Rev.	Sht.	Latest Rev.	Sht.	Latest Rev.	Sht.	Latest Rev.
1	004	33	000										
2	004	34	001										
3	000	35	000										
4	000	36	000										
5	004	37	000										
6	001	38	000										
7	000	39	000										
8	000	40	000										
9	000	41	000										
10	000	42	000										
11	001	43	000										
12	000	44	000										
13	000	45	000										
14	001	46	000										
15	000	47	003										
16	000	48	000										
17	000	49	000										
18	001	50	000										
18a	001	Att A	004										
19	000	Att B	000										
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<u>Attachment</u>	<u>No. of Sheets</u>
A. Microcomputer and Software Testing Report	1
B. LADTAP II Input and Output	23
C. GASPAR II Input and Output	53

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1.0 Purpose

In support of the Early Site Permit (ESP) Application for Victoria County Station, determine the following from the normal operation of the proposed new units:

- Activity concentrations in water and air from liquid and gaseous effluents
- Doses to members of the public
- Doses to construction workers during the period that at least one unit is operating and another unit is under construction

The following six reactor technologies are being considered for the ESP:

- AP1000 – two units
- APWR – two units
- GEH ABWR – two units
- Toshiba ABWR – two units
- ESBWR – two units
- mPower – 12 units

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2.0 References

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3.0 Data

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4.0 Assumptions

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5.0 Analysis

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6.0 Results & Conclusions

The activity concentrations in water are shown in Table 5-8. The activity concentrations in air are shown in Table 5-9. Both the water and air concentrations meet the acceptance criteria of 10 CFR 20, Appendix B.

Doses are shown in the following tables. Doses to the maximally exposed individual (MEI) and construction workers meet the applicable acceptance criteria in 10 CFR 20, 10 CFR 50, Appendix I, and 40 CFR 190.

Receptor	Source	Table
MEI	Liquid Effluents	Table 6-1
	Gaseous Effluents	Table 6-4
	All	Table 6-8, Table 6-9 – Compliance with regulations
Population	Liquid Effluents	Table 6-2
	Gaseous Effluents	Table 6-5
	All	Table 6-10
Biota	Liquid Effluents	Table 6-3
	Gaseous Effluents	Table 6-6
	All	Table 6-11
Construction Worker	Gaseous Effluents	Table 6-12
	All	Table 6-13 – All pathways Table 6-14, Table 6-15, Table 6-16, Table 6-17 – Compliance with regulations

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Subject	Radiological Impacts of Normal Operation for ESP		
By	S. Jha	Date	6/8/11

Attachment A: Microcomputer and Software Testing Report

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Attachment B: LADTAP II Input and Output

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Attachment C: GASPAR II Input and Output

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Calc No. 25352-000-M0C-HARA-00003
Sheet No. C-20
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CALCULATION SHEET

Project	Victoria County Station
Job No.	25352
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Sheet No.	C-21
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Subject	Radiological Impacts of Normal Operation for ESP		
By	S. Jha	Date	11/25/09

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CALCULATION SHEET

Project	Victoria County Station
Job No.	25352
Calc No.	25352-000-M0C-HARA-00003
Sheet No.	C-22
Sheet Rev.	000

Subject	Radiological Impacts of Normal Operation for ESP		
By	S. Jha	Date	11/25/09

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Project	Victoria County Station
Job No.	25352
Calc No.	25352-000-M0C-HARA-00003
Sheet No.	C-23
Sheet Rev.	000

Subject	Radiological Impacts of Normal Operation for ESP		
By	S. Jha	Date	11/25/09

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CALCULATION SHEET

Subject Radiological Impacts of Normal Operation for ESP
By S. Jha Date 11/25/09

Project Victoria County Station
Job No. 25352
Calc No. 25352-000-M0C-HARA-00003
Sheet No. C-24
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Project	Victoria County Station
Job No.	25352
Calc No.	25352-000-M0C-HARA-00003
Sheet No.	C-25
Sheet Rev.	000

Subject	Radiological Impacts of Normal Operation for ESP		
By	S. Jha	Date	11/25/09

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CALCULATION SHEET

Project	Victoria County Station
Job No.	25352
Calc No.	25352-000-M0C-HARA-00003
Sheet No.	C-26
Sheet Rev.	000

Subject	Radiological Impacts of Normal Operation for ESP		
By	S. Jha	Date	11/25/09

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CALCULATION SHEET

Project	Victoria County Station
Job No.	25352
Calc No.	25352-000-M0C-HARA-00003
Sheet No.	C-27
Sheet Rev.	000

Subject	Radiological Impacts of Normal Operation for ESP		
By	S. Jha	Date	11/25/09

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Project	<u>Victoria County Station</u>
Job No.	<u>25352</u>
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Subject	<u>Radiological Impacts of Normal Operation for ESP</u>		
By	<u>S. Jha</u>	Date	<u>11/25/09</u>

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Project	Victoria County Station
Job No.	25352
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Subject	Radiological Impacts of Normal Operation for ESP		
By	S. Jha	Date	11/25/09

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CALCULATION SHEET

Project	Victoria County Station
Job No.	25352
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Sheet No.	C-30
Sheet Rev.	000

Subject	Radiological Impacts of Normal Operation for ESP		
By	S. Jha	Date	11/25/09

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CALCULATION SHEET

Project	Victoria County Station
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Subject	Radiological Impacts of Normal Operation for ESP		
By	S. Jha	Date	11/25/09

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CALCULATION SHEET

Project Victoria County Station

Job No. 25352

Calc No. 25352-000-M0C-HARA-00003

Subject Radiological Impacts of Normal Operation for ESP

Sheet No. C-32

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Job No.	25352
Calc No.	25352-000-M0C-HARA-00003
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Subject	Radiological Impacts of Normal Operation for ESP		
By	S. Jha	Date	11/25/09

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CALCULATION SHEET

Project Victoria County Station

Job No. 25352

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By S. Jha

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Subject Radiological Impacts of Normal Operation for ESP
By S. Jha Date 11/25/09

Project Victoria County Station
Job No. 25352
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Sheet No. C-35
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Sheet No.	C-36
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Subject	Radiological Impacts of Normal Operation for ESP		
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Project	Victoria County Station
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Calc No.	25352-000-M0C-HARA-00003
Sheet No.	C-37
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Subject	Radiological Impacts of Normal Operation for ESP		
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Subject Radiological Impacts of Normal Operation for ESP
By S. Jha Date 11/25/09

Project Victoria County Station
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Calc No. 25352-000-M0C-HARA-00003
Sheet No. C-38
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CALCULATION SHEET

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Calc No.	25352-000-M0C-HARA-00003
Sheet No.	C-39
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Subject	Radiological Impacts of Normal Operation for ESP		
By	S. Jha	Date	11/25/09

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CALCULATION SHEET

Project	Victoria County Station
Job No.	25352
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Sheet No.	C-40
Sheet Rev.	000

Subject	Radiological Impacts of Normal Operation for ESP		
By	S. Jha	Date	11/25/09

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CALCULATION SHEET

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CALCULATION SHEET

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Sheet No.	C-42
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Subject	Radiological Impacts of Normal Operation for ESP		
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CALCULATION SHEET

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Sheet No.	C-43
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Subject	Radiological Impacts of Normal Operation for ESP		
By	S. Jha	Date	11/25/09

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CALCULATION SHEET

Project	Victoria County Station
Job No.	25352
Calc No.	25352-000-M0C-HARA-00003
Sheet No.	C-44
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Subject	Radiological Impacts of Normal Operation for ESP		
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Calc No.	25352-000-M0C-HARA-00003
Sheet No.	C-45
Sheet Rev.	000

Subject	Radiological Impacts of Normal Operation for ESP		
By	S. Jha	Date	11/25/09

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CALCULATION SHEET

Subject Radiological Impacts of Normal Operation for ESP
By S. Jha Date 11/25/09

Project Victoria County Station
Job No. 25352
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Sheet No. C-46
Sheet Rev. 000

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Project	Victoria County Station
Job No.	25352
Calc No.	25352-000-M0C-HARA-00003
Sheet No.	C-47
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Subject	Radiological Impacts of Normal Operation for ESP		
By	S. Jha	Date	11/25/09

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Sheet No.	C-48
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Subject	Radiological Impacts of Normal Operation for ESP		
By	S. Jha	Date	11/25/09

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Project	Victoria County Station
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Sheet No.	C-49
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Subject	Radiological Impacts of Normal Operation for ESP		
By	S. Jha	Date	11/25/09

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CALCULATION SHEET

Subject Radiological Impacts of Normal Operation for ESP
By S. Jha Date 11/25/09

Project Victoria County Station
Job No. 25352
Calc No. 25352-000-M0C-HARA-00003
Sheet No. C-50
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CALCULATION SHEET

Project	Victoria County Station
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Sheet No.	C-51
Sheet Rev.	000

Subject	Radiological Impacts of Normal Operation for ESP		
By	S. Jha	Date	11/25/09

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CALCULATION SHEET

Project	Victoria County Station
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Sheet No.	C-52
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Subject	Radiological Impacts of Normal Operation for ESP		
By	S. Jha	Date	11/25/09

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Project	Victoria County Station
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Sheet No.	C-53
Sheet Rev.	000

Subject	Radiological Impacts of Normal Operation for ESP		
By	S. Jha	Date	11/25/09

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Question 11.02-5 Affidavit

(3 Pages)

**10 CFR 2.390
AFFIDAVIT OF JOHN K. ATWELL
SUPPORTING APPLICATION TO WITHHOLD
FROM PUBLIC DISCLOSURE**

**BECHTEL CALCULATION 25352-000-M0C-HARA-00003, "RADIOLOGICAL IMPACTS OF
NORMAL OPERATION FOR ESP, REVISION 4, Jun3 9, 2011**

I, John K. Atwell, Manager of Nuclear Operations, of Bechtel Power Corporation (Bechtel), having been duly sworn, do hereby affirm and state:

I have been authorized by Bechtel to (a) review the information owned by Bechtel which is referenced herein relating to supporting analyses for the Victoria County Station (VCS) Early Site Permit Application (ESPA) Site Safety Analysis Report (SSAR) which Bechtel seeks to have withheld from public disclosure pursuant to 10 CFR 2.390(a)(4), and (b) apply for the withholding of such information from public disclosure by the Nuclear Regulatory Commission (NRC) on behalf of Bechtel.

1. Pursuant to the provisions of 10 CFR 2.390(b)(3), the following is furnished for consideration by the Commission in determining whether the information sought to be withheld from public disclosure should be withheld.
 - i. The information sought to be withheld from public disclosure is owned and has been held in confidence by Bechtel.
 - ii. The information is of a type customarily held in confidence by Bechtel and not customarily disclosed to the public. Bechtel has a rational basis for determining the types of information customarily held in confidence by it and, in that connection, utilizes a system to determine when and whether to hold certain types of information in confidence. The application of that system and the substance of that system constitute Bechtel policy and provide the rational basis required.

Under that system, information is held in confidence if it falls in one or more of several types, the release of which might result in the loss of an existing or potential competitive advantage, as follows:

- a) The information reveals the distinguishing aspects of a process (or component, structure, tool, method, etc.) where presentation of its use by any of Bechtel's competitors without license from Bechtel constitutes a competitive economic advantage.
- b) It consists of supporting data, including test data, relative to a process (or component, structure, tool, method, etc.), the application of which data secures a competitive economic advantage (e.g., by optimization or improved marketability).
- c) Its use by a competitor would reduce their expenditure of resources or improve their competitive position in the design, manufacture, shipment, installation, assurance of quality, or licensing a similar product.

- d) It reveals cost or price information, production capacities, budget levels, or commercial strategies of Bechtel, its customers, or suppliers.
- e) It reveals aspects of past, present, or future Bechtel or customer funded development plans and programs of potential commercial value to Bechtel.
- f) It contains patentable ideas, for which patent protection may be desirable.

There are sound policy reasons behind the Bechtel system which include the following:

- a) The use of such information by Bechtel gives Bechtel a competitive advantage over its competitors. It is, therefore, withheld from disclosure to protect the Bechtel competitive position.
 - b) It is information, which is marketable in many ways. The extent to which such information is available to competitors diminishes Bechtel's ability to sell products and services involving the use of the information.
 - c) Use by our competitors would put Bechtel at a competitive disadvantage by reducing their expenditure of resources at Bechtel expense.
 - d) Each component of proprietary information pertinent to a particular competitive advantage is potentially as valuable as the total competitive advantage. If competitors acquire components of proprietary information, any one component may be the key to the entire puzzle, thereby depriving Bechtel of a competitive advantage.
 - e) Unrestricted disclosure would jeopardize the position of prominence of Bechtel in the world market, and thereby give a market advantage to the competition.
 - f) The Bechtel capacity to invest corporate assets in research and development depends upon the success in obtaining and maintaining a competitive advantage.
- iii. The information is being transmitted to the Commission in confidence and, under the provisions of 10 CFR 2.390, it is to be received in confidence by the Commission.
 - iv. The information sought to be protected is not available in public sources or available information has not been previously employed in the same original manner or method to the best of our knowledge and belief.
 - v. The proprietary information specifically sought to be withheld is Bechtel Calculation 25352-000-M0C-HARA-00003, "Radiological Impacts of Normal Operation for ESP," Revision 4, 6/9/11, which was prepared to support the evaluation of radiation doses due to liquid and gaseous effluents under normal operation as documented in the Victoria County Station ESPA SSAR Sections 11.2.3.2, "Liquid Pathway Doses," and 11.3.3.2, "Gaseous Pathway Doses."
 - vi. This calculation was prepared by Bechtel to determine the following from the normal operation of the proposed new units: activity concentrations in water and air from liquid and gaseous effluents; doses to members of the public; and doses to construction workers during the period that at least one unit is operating and another unit is under

construction at Victoria County Station.

Public disclosure of this proprietary information is likely to cause substantial harm to the competitive position of Bechtel because it would enhance the ability of competitors to perform similar calculations and related services for commercial power reactors without commensurate expenses. Also, public disclosure of the information would enable others to use the information to meet NRC requirements for licensing documentation without purchasing the right to use the information.

The development of the information described in part is the result of applying the results of many analyst-hours and significant monetary expenditure.

In order for a competitor of Bechtel to duplicate this information, similar analyses would have to be performed and a significant manpower effort, having the requisite talent and experience, would have to be expended.

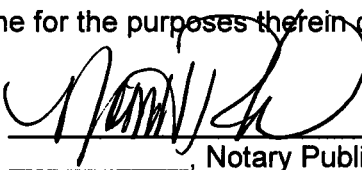
Further affiant sayeth not.

I, John K. Atwell, having been duly sworn, hereby confirms that I am the Manager of Nuclear Operations, of Bechtel Power Corporation, that I am authorized on behalf of Bechtel to review the information attached hereto and to sign and file with the Nuclear Regulatory Commission this affidavit and the attachments hereto, and that the statements made and matters set forth herein are true and correct to the best of my knowledge, information, and belief.



John K. Atwell

On this 9 day of JUNE 2011, the individual signing above personally appeared before me, is known by me to be the person whose name is subscribed to within the instrument, and acknowledged that he executed the same for the purposes therein contained. In witness hereof I hereunto set my hand and official seal.


_____, Notary Public
State of Maryland, Frederick County
My commission expires 10/18/11

RAI 11.03-2:**Question:**

Please provide detailed information to enable the NRC staff to validate and verify the estimated gaseous effluent doses discussed in the applicant's ESP, Section 11.3.3.2. Gaseous Pathway Doses, with respect to the dose objectives of Appendix I to 10 CFR 50, and the dose limits in 10 CFR 20.1301(e).

The information should include the following:

- 1.) A complete description of how the applicant derived all the values, including all assumptions made;
- 2.) Citations to any reference material used (for documents not publicly available, please provide a copy at an audit location for the NRC staff's review).
- 3.) A detailed breakdown of individual doses and the maximally exposed individual (MEI) doses by pathway and organ; and
- 4.) A detailed breakdown of population doses by pathway and organ.
- 5.) Provide the basis for parameters and values used in the GASPARD code or equivalent calculation.
- 6.) Provide the GASPARD code input/output files used to calculate the gaseous effluent doses.

Response:

The calculation, "Radiological Impacts of Normal Operation for ESP," Calculation No. 25352-000-MOC-HARA-00003, Revision 004, includes an evaluation of gaseous effluent doses and was provided in response to RAI 11.02-5. This calculation provides the methodology, assumptions, references, and bases for GASPARD II inputs, as well as a breakdown of the resulting individual and population doses by pathway and organ. Calculation No. 25352-000-MOC-HARA-00003, entitled "Radiological Impacts of Normal Operation for ESP," contains proprietary intellectual information and is requested to be withheld from public disclosure, as described in the transmittal cover letter. Non-Proprietary and Proprietary versions are provided in Attachments 7 and 7A, respectively, in response to RAI 11.02-5.

The GASPARD II input and output files that are listed in the calculation are also being provided electronically on compact disc in Attachment 12.

Associated ESPA Revision:

No ESPA revision is required as a result of this response.

ATTACHMENT 9

SUMMARY OF REGULATORY COMMITMENTS

(Exelon Letter to USNRC, NP-11-0026, dated June 23, 2011)

The following table identifies commitments made in this document. (Any other actions discussed in the submittal represent intended or planned actions. They are described to the NRC for the NRC's information and are not regulatory commitments.)

COMMITMENT	COMMITTED DATE	COMMITMENT TYPE	
		ONE-TIME ACTION (Yes/No)	Programmatic (Yes/No)
Exelon will revise the VCS ESPA SSAR Section 2.5.4 to incorporate the change shown in the enclosed response to the following NRC RAI: 02.05.04-1 (Attachment 1)	Revision 1 of the ESPA SSAR and ER planned for no later than March 31, 2012	Yes	No
Exelon will revise the VCS ESPA SSAR Section 2.5.4 to incorporate the change shown in the enclosed response to the following NRC RAI: 02.05.04-11 (Attachment 3)	Revision 1 of the ESPA SSAR and ER planned for no later than March 31, 2012	Yes	No
Exelon will revise the VCS ESPA SSAR Section 2.5.5 to incorporate the change shown in the enclosed response to the following NRC RAI: 02.05.05-5 (Attachment 4)	Revision 1 of the ESPA SSAR and ER planned for no later than March 31, 2012	Yes	No

ATTACHMENT 10

**CD-R labeled:
SLOPE/W Input Files**

(Two copies)

ATTACHMENT 11

CD-R labeled:

LADTAP I/O Files 25352-000-M0C-HARA-00003, Rev. 4

Document Components:

11/08/2009 02:05 PM 5,962 Liquid.dat
11/08/2009 02:06 PM 65,323 Liquid.out

(Two copies)

ATTACHMENT 12

CD-R labeled:

GASPAR I/O Files 25352-000-M0C-HARA-00003, Rev. 4

Document Components:

10/19/2009 02:10 PM 4,705 Gas1.dat
10/29/2009 12:33 PM 166,459 Gas1.out
10/19/2009 02:11 PM 4,611 Gas2.dat
10/29/2009 12:34 PM 138,862 Gas2.out
10/29/2009 02:54 PM 4,419 Gas3.dat
10/29/2009 03:01 PM 90,770 Gas3.out
10/29/2009 12:08 PM 12,090 Gas_XOQ.dat

(Two copies)