

**Attachment 10**  
**Capital Cost Evaluation**

<b>Section 1:</b>	<b>Conversion of Unit 2 and Unit 3</b>
<b>Section 2:</b>	<b>Conversion of Only Unit 2</b>
<b>Section 3:</b>	<b>Conversion of Only Unit 3</b>
<b>Section 4:</b>	<b>Vendor Data</b>

### Cost Multipliers

Each cost estimate in this Attachment will have two cost multipliers:

- Recommended Minimum Contingency (30%)<sup>1</sup>
- Corporate Overheads and Work In Progress Cost (30%)<sup>2</sup>

The current stage of development of the various conceptual designs provides a sound basis for estimating the associated overall design, procurement, and construction costs. However, none of this captures the full scope of work, as would be possible if the final detailed design were completed, all associated bill of materials developed, and vendor quotes obtained for all materials. For this reason, a Recommended Minimum Contingency of 30% was added to all cost estimates.

Additionally, a cost multiplier of 30% was added to the design and installation costs to capture both corporate overhead and the cost of carrying the associated funding (i.e., a Corporate Overheads and Work In Progress Cost).

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<sup>1</sup> United States Department of Energy. Cost Estimating Guide. Publication No. DOE G 430.1-1. March 28, 1997.

<sup>2</sup> Entergy Nuclear Operations, Inc. Procedure EN-DC-114. Project Management. Rev. 10. June 12, 2009.

### Basis of Cost Estimate

The initial capital costs to convert IPEC to closed-loop cooling include the cost of engineering design; the selection, procurement, and installation of major equipment (i.e., cooling towers, pumps, valves, etc.); and the costs of closed-loop construction, including the blasting required to excavate the cooling tower areas. Capital cost estimation was done in such a way as to minimize the necessary assumptions, and relied instead on well-developed, detailed conceptual designs to greatly increase the accuracy of the estimates. However, costs are likely to be understated due to the unprecedented nature of a conversion of an existing nuclear station to closed-loop cooling. The 2003 Report lists the components and construction activities necessary for closed-loop operation, providing a high level of detail to the conceptual design estimation (Attachment 1).

Three estimation techniques were used to determine the initial capital costs:

(1) Vendor provided budgetary estimates

Industry leading vendors were contacted for updated quotations on the major equipment and material components to allow for as accurate an estimation as possible, with the correspondence, reference material, and quotations provided in Section 4 of this Attachment.

(2) Third-party detailed construction estimates

Since blasting at each of the Unit cooling tower sites would require a unique engineering solution, a nationally recognized consultant was used to determine a conceptual design, cost, and schedule for blasting (Attachment 7).

(3) Computational estimation utilizing national production rates and cost factoring

Remaining cooling equipment and construction activities were estimated using 2009 RSMeans cost data software at MeansCostWorks.com. RSMeans is a construction cost estimating tool that provides detailed cost estimates for the construction industry including labor, piping, concrete, industrial equipment, electrical systems, and other heavy construction components.

Much of the cost information provided in this attachment consists of update information from the 2003 Report; such updated information is noted accordingly.

The following summarizes the engineering and construction capital cost estimate in 2009 dollars for the implementation of closed-loop cooling at IPEC Units 2 & 3.

<b>Conversion of IPEC Units 2 and 3 to Closed-Loop Cooling</b>		
<b>Work Scope</b>	<b>Estimated Cost</b>	<b>Notes:</b>
Design Engineering and Modification Packages	\$ 25,526,000	15% of non-turn-key estimates <sup>1</sup>
Project Management and Support Labor	\$ 44,598,000	Updated ENERCON Estimate
<b>Turn-Key Estimates</b>		
Blasting <span style="margin-left: 150px;"><b>Unit 2</b></span>	\$ 40,108,000	Attachment 7, Section 1
Round Hybrid Cooling Tower <span style="margin-left: 150px;"><b>Unit 3</b></span>	\$ 205,000,000	Attachment 9, Section 4
Round Hybrid Cooling Tower	\$ 205,000,000	Attachment 9, Section 4
Relocation of Algonquin Pipeline	\$ 13,800,000	Attachment 6, Section 1
<b>Subtotal</b>	<b>\$ 463,908,000</b>	
<b>Tasks for Closed-Loop Cooling Implementation</b>		
<b>Phase I - Online (Pre-Outage)</b>		
Mobilization and Setup	\$ 847,000	Updated ENERCON Estimate
General Site Modifications	\$ 11,342,000	Updated ENERCON Estimate
Spoils Removal and Disposal <span style="margin-left: 150px;"><b>Unit 2</b></span>	\$ 55,620,000	ENERCON Estimate
Pre-Outage Construction Activities (Cooling Tower Installation, Electrical, Mechanical, etc.) <span style="margin-left: 150px;"><b>Unit 3</b></span>	\$ 11,290,000	Updated ENERCON Estimate
Pre-Outage Construction Activities (Cooling Tower Installation, Electrical, Mechanical, etc.)	\$ 10,396,000	Updated ENERCON Estimate
<b>Phase II - Offline (Outage Required)</b>		
Common Construction Activities (Discharge Canal Modifications, Trenching and Excavation, etc.) <span style="margin-left: 150px;"><b>Unit 2</b></span>	\$ 23,515,000	Updated ENERCON Estimate
Construction Activities Requiring an Outage (Pump House Construction, Large Bore Piping, Tie-In, etc.) <span style="margin-left: 150px;"><b>Unit 3</b></span>	\$ 28,465,000	Updated ENERCON Estimate
Construction Activities Requiring an Outage (Pump House Construction, Large Bore Piping, Tie-In, etc.)	\$ 27,250,000	Updated ENERCON Estimate
Testing and Commissioning	\$ 825,000	Updated ENERCON Estimate
Demobilization	\$ 617,000	Updated ENERCON Estimate
<b>Subtotal</b>	<b>\$ 170,167,000</b>	
<b>Total Work Scope</b>		
<b>Subtotal</b>	<b>\$ 704,199,000</b>	
Corporate Overheads and Work In Progress Cost (30%)	\$ 211,260,000	
Recommended Minimum Contingency (30%)	\$ 274,638,000	
<b>Recommended Engineering and Construction Budget</b>	<b>\$ 1,190,097,000</b>	

1. United States Department of Energy. March 28, 1997. Cost Estimating Guide. Publication No. DOE G 430.1-1

The following summarizes the engineering and construction capital cost estimate in 2009 dollars for the implementation of closed-loop cooling at IPEC Unit 2.

<b>Conversion of IPEC Unit 2 to Closed-Loop Cooling</b>		
<b>Work Scope</b>	<b>Estimated Cost</b>	<b>Notes:</b>
Design Engineering and Modification Packages	\$ 15,388,000	15% of non-turn-key estimates <sup>1</sup>
Project Management and Support Labor	\$ 31,219,000	Updated ENERCON Estimate
<b>Unit 2</b>		
Round Hybrid Cooling Tower	\$ 205,000,000	Attachment 9, Section 4
Blasting	\$ 18,070,000	Attachment 7, Section 1
Subtotal	\$ 223,070,000	
<b>Tasks for Closed-Loop Cooling Implementation</b>		
<b>Phase I - Online (Pre-Outage)</b>		
Mobilization and Setup	\$ 593,000	Updated ENERCON Estimate
General Site Modifications	\$ 7,940,000	Updated ENERCON Estimate
Spoils Removal and Disposal	\$ 29,770,000	ENERCON Estimate
<b>Unit 2</b>		
Pre-Outage Construction Activities (Cooling Tower Installation, Electrical, Mechanical, etc.)	\$ 11,290,000	Updated ENERCON Estimate
<b>Phase II - Offline (Outage Required)</b>		
Common Construction Activities (Discharge Canal Modifications, Trenching and Excavation, etc.)	\$ 23,515,000	Updated ENERCON Estimate
<b>Unit 2</b>		
Construction Activities Requiring an Outage (Pump House Construction, Large Bore Piping, Tie-In, etc.)	\$ 28,465,000	Updated ENERCON Estimate
Testing and Commissioning	\$ 578,000	Updated ENERCON Estimate
Demobilization	\$ 432,000	Updated ENERCON Estimate
Subtotal	\$ 102,583,000	
<b>Total Work Scope</b>		
Subtotal	\$ 372,260,000	
Corporate Overheads and Work In Progress Cost (30%)	\$ 111,678,000	
Recommended Minimum Contingency (30%)	\$ 145,182,000	
<b>Recommended Engineering and Construction Budget</b>	<b>\$ 629,120,000</b>	

1. United States Department of Energy. March 28, 1997. Cost Estimating Guide. Publication No. DOE G 430.1-1

The following summarizes the engineering and construction capital cost estimate in 2009 dollars for the implementation of closed-loop cooling at IPEC Unit 3.

<b>Conversion of IPEC Unit 3 to Closed-Loop Cooling</b>		
Work Scope	Estimated Cost	Notes:
Design Engineering and Modification Packages	\$ 14,441,000	15% of non-turn-key estimates <sup>1</sup>
Project Management and Support Labor	\$ 31,219,000	Updated ENERCON Estimate
Turn-Key Estimates		
Unit 3		
Round Hybrid Cooling Tower	\$ 205,000,000	Attachment 9, Section 4
Relocation of Algonquin Pipeline	\$ 13,800,000	Attachment 6, Section 1
Blasting	\$ 23,310,000	Attachment 7, Section 1
Subtotal	\$ 242,110,000	
Tasks for Closed-Loop Cooling Implementation		
Phase I - Online (Pre-Outage)		
Mobilization and Setup	\$ 593,000	Updated ENERCON Estimate
General Site Modifications	\$ 7,940,000	Updated ENERCON Estimate
Spoils Removal and Disposal	\$ 25,716,000	ENERCON Estimate
Unit 3		
Pre-Outage Construction Activities (Cooling Tower Installation, Electrical, Mechanical, etc.)	\$ 10,396,000	Updated ENERCON Estimate
Phase II - Offline (Outage Required)		
Common Construction Activities (Discharge Canal Modifications, Trenching and Excavation, etc.)	\$ 23,515,000	Updated ENERCON Estimate
Unit 3		
Construction Activities Requiring an Outage (Pump House Construction, Large Bore Piping, Tie-In, etc.)	\$ 27,099,000	Updated ENERCON Estimate
Testing and Commissioning	\$ 578,000	Updated ENERCON Estimate
Demobilization	\$ 432,000	Updated ENERCON Estimate
Subtotal	\$ 96,269,000	
Total Work Scope		
Subtotal	\$ 384,039,000	
Corporate Overheads and Work In Progress Cost (30%)	\$ 115,212,000	
Recommended Minimum Contingency (30%)	\$ 149,776,000	
<b>Recommended Engineering and Construction Budget</b>	<b>\$ 649,027,000</b>	

1. United States Department of Energy. March 28, 1997. Cost Estimating Guide. Publication No. DOE G 430.1-1

**2010 Update to Cooling Tower Cost:**

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**From:** John.Arntson@ct.spx.com [mailto:John.Arntson@ct.spx.com]

**Sent:** Monday, September 28, 2009 9:59 AM

**To:** Jim Hubbard

**Subject:** Indian Point

Jim,

Based on fairly recent pricing for Calvert Cliffs (also salt/brackish water), the budgetary pricing for Indian Point would be approx. \$ 205,000,000 per tower.

FYI,

John K Arntson  
SPX Cooling Technologies, Inc.  
7401W 129 th St.  
Overland Park, KS  
66213

E-mail: [john.arntson@ct.spx.com](mailto:john.arntson@ct.spx.com)

**2010 Update to Circulating Water Pump Cost:**

-----Original Message-----

From: Harrelson, Jerry [mailto:Jerry.Harrelson@sulzer.com]  
Sent: Monday, September 14, 2009 9:44 AM  
To: Richard Clubb  
Cc: Jim Hubbard  
Subject: RE: Pump Quote Update

Richard,

A budget price for the pumps already quoted should be increased by 5% to cover the cost of material increases.

Thanks,

Jerry Harrelson  
Nuclear Account Manager  
Sulzer Pumps (US) Inc.  
4126 Caine Lane  
Chattanooga, TN 37421

Internet [www.sulzerpumps.com](http://www.sulzerpumps.com)

-----Original Message-----

From: Richard Clubb [mailto:rclubb@enercon.com]  
Sent: Wednesday, September 02, 2009 11:23 AM  
To: Harrelson, Jerry  
Cc: 'Jim Hubbard'  
Subject: Pump Quote Update

Jerry,

Attached is a pump quotation that was provided to Jim Hubbard back in 2003. We are updating this project to current pricing and technology and were hoping you would be able to confirm that this product is still available and update the quotation to current pricing?

Thanks in advance for your assistance with both of these pump requests, and if you have any questions please feel free to contact either myself or Jim Hubbard.

Richard T. Clubb  
Enercon Services, Inc.