

Serial No. 04-126

Enclosure 6

NON-PROPRIETARY VERSION

Bechtel Calculation 24830-G-007, Rev. 0, Thermal Modeling of the North Anna Cooling
Lake System



CALCULATION COVER SHEET

PROJECT Dominion North Anna ESP Project	JOB NO. 24830-003	CALC NO. 24830-G-007	SHEET 1
SUBJECT Thermal Modeling of the North Anna Cooling Lake System		DISCIPLINE G&HES	

CALCULATION STATUS DESIGNATION	PRELIMINARY	CONFIRMED	SUPERSEDED	VOIDED
	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

COMPUTER PROGRAM/TYPE	SCP	PROGRAM NO.	VERSION/RELEASE NO.
	<input type="checkbox"/>		

ATTACHMENTS:

THIS CALCULATION HAS BEEN REVIEWED BY BECHTEL POWER CORPORATION AND ANY PROPRIETARY INFORMATION HAS BEEN REMOVED. WHEREVER PROPRIETARY INFORMATION HAS BEEN REMOVED, BRACKETS HAVE BEEN INSERTED CONTAINING THE STATEMENT "PROPRIETARY INFORMATION DELETED."

[PROPRIETARY INFORMATION DELETED]

0	Issue to project						
NO.	REASON FOR REVISION	TOTAL NO. OF SHEETS	LAST SHEET NO.	BY	CHECKED	APPROVED/ACCEPTED	DATE

RECORD OF REVISIONS

Bechtel Confidential

2



CALCULATION SHEET

PROJECT: Dominion North
Anna ESP Project

JOB NUMBER: 24830-003
CALC NO. 24830-G-007

SUBJECT Thermal Modeling of the North Anna Cooling Lake System

SHEET NO. 2

BY Alexander Kochurov

DATE 13 July 2003

SHEET REV. 0

USER MICROCOMPUTER AND SOFTWARE TESTING STATEMENT

[PROPRIETARY INFORMATION DELETED]

**CALCULATION SHEET**PROJECT: Dominion North
Anna ESP ProjectJOB NUMBER: 24830-003
CALC NO. 24830-G-007SUBJECT Thermal Modeling of the North Anna Cooling Lake SystemSHEET NO. 3BY Alexander KochurovDATE 13 July 2003SHEET REV. 0**I. OBJECTIVES**

This calculation is performed to analyse the thermal impact on Lake Anna "Cooling Lake" (CL) due to additional heat load from the new generation units of the North Anna Power Station (NAPS). The CL consists of two parts: a cooling pond, called Waste Heat Treatment Facilities (WHTF), and a main lake, called North Anna Reservoir. The MIT Cooling Lake Model is being used to assess the thermal effect of the existing units and combination of future units. This calculation documents: 1) calibration of the MIT Cooling Lake Model, 2) validation of the model performance, and finally 3) model prediction to estimate the effects of additional heat load due to new generation.

II. REFERENCES

[PROPRIETARY INFORMATION DELETED]

III. BACKGROUND

[PROPRIETARY INFORMATION DELETED]

IV. METHODOLOGY & APPROACH

[PROPRIETARY INFORMATION DELETED]

**CALCULATION SHEET**PROJECT: Dominion North
Anna ESP ProjectJOB NUMBER: 24830-003
CALC NO. 24830-G-007SUBJECT Thermal Modeling of the North Anna Cooling Lake SystemSHEET NO. 4BY Alexander KochurovDATE 13 July 2003SHEET REV. 0**V. MIT COOLING LAKE MODEL DESCRIPTION***[PROPRIETARY INFORMATION DELETED]***VI. MODEL INPUT***[PROPRIETARY INFORMATION DELETED]***1. Program Input Data***[PROPRIETARY INFORMATION DELETED]***2. Plant Operation Data***[PROPRIETARY INFORMATION DELETED]***a) Computation of Cooling Water Discharge Temperature Rise for Existing Units (Calibration and Validation Runs)***[PROPRIETARY INFORMATION DELETED]*



CALCULATION SHEET

PROJECT: Dominion North
Anna ESP Project

JOB NUMBER: 24830-003
CALC NO. 24830-G-007

SUBJECT Thermal Modeling of the North Anna Cooling Lake System

SHEET NO. 5

BY Alexander Kochurov

DATE 13 July 2003

SHEET REV. 0

b) Computation of Plant Discharge Flow for Existing Units During Operation (Calibration and Validation Runs)

[PROPRIETARY INFORMATION DELETED]

3. Meteorological Data

[PROPRIETARY INFORMATION DELETED]

**CALCULATION SHEET**PROJECT: Dominion North
Anna ESP ProjectJOB NUMBER: 24830-003
CALC NO. 24830-G-007SUBJECT Thermal Modeling of the North Anna Cooling Lake SystemSHEET NO. 6BY Alexander KochurovDATE 13 July 2003SHEET REV. 0**VII. MODEL OUTPUT***[PROPRIETARY INFORMATION DELETED]***VIII. MODEL CALIBRATION: RESULTS AND DISCUSSION***[PROPRIETARY INFORMATION DELETED]***IX. MODEL VALIDATION: RESULTS AND DISCUSSION***[PROPRIETARY INFORMATION DELETED]***XI. HEAT BALANCE CALCULATION***[PROPRIETARY INFORMATION DELETED]***ATTACHMENTS***[PROPRIETARY INFORMATION DELETED]*