NUREG-0247
COO-2477-11

7 IN A SERIES OF 8

7 **Commercial Electric Power Cost Studies**

Prepared for the U.S. Nuclear Regulatory Commission and the Department of Energy by United Engineers & Constructors Inc.

Cooling Systems Addendum: Capital and Total Generating Cost Studies

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NUREG-0247 COO-2477-11

Cooling Systems Addendum: **Capital and Total Generating Cost Studies**

Commercial Electric Power Cost Studies

Prepared for the U.S. Nuclear Regulatory Commission under contract No. AT (49-24)-0351 and the U.S. Department of Energy under contract No. EY-76-C-02-2477 by United Engineers & Constructors Inc., 30 South 17th Street, P.O. Box 8223, Philadelphia, Pa. 19101

September 1978

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1 Capital Cost: Pressurized Water Reactor Plant
NUREG-0241, COO-2477-5

2 Capital Cost: Boiling Water Reactor Plant
NUREG-0242, COO-2477-6

3 Capital Cost: High and Low Sulfur Coal Plants—1200 MWe
NUREG-0243, COO-2477-7

4 Capital Cost: Low and High Sulfur Coal Plants—800 MWe
NUREG-0244, COO-2477-8

5 Capital Cost Addendum: Multi-Unit Coal and Nuclear Stations
NUREG-0245, COO-2477-9

6 Fuel Supply Investment Cost: Coal and Nuclear
NUREG-0246, COO-2477-10

7 Cooling Systems Addendum: Capital and Total Generating Cost Studies
NUREG-0247, COO-2477-11

8 Total Generating Costs: Coal and Nuclear Plants
NUREG-0248, COO-2477-12

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COMMERCIAL ELECTRIC POWER COST STUDY
COOLING SYSTEM ADDENDUM:
CAPITAL AND TOTAL GENERATING COST STUDIES

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FOREWORD
by the

United States Energy Research & Development Administration
and United States Nuclear Regulatory Commission

In 1971 the Atomic Energy Commission authorized power plant investment cost studies, which culminated in the WASH-1230 reports (1000 MWe Central Station Power Plants - Investment Cost Study) published in 1972. Their purpose was to facilitate policy and economic decisions about electric generation facilities in the public and private sectors. The WASH-1230 report-series consists of five volumes: Pressurized Water Reactor, Boiling Water Reactor, Coal-Fired, Oil-Fired and High Temperature Gas-Cooled Reactor power plants. National priorities on energy, the regulatory environment and the cost of labor, equipment and material have changed significantly. These changes dictated the necessity of an update of these series of studies, and an expansion of scope to encompass consideration of the fuel cycle and the total generating cost. As a result, a program to study, reassess and produce a new set of updated reports was authorized and undertaken.

This report is one of the new series of commercial electric power cost studies that have been prepared by United Engineers & Constructors Inc. (UE&C). These studies have been completed under the cooperative direction of the Energy Research and Development Administration (ERDA), Division of Nuclear Research and Applications, and the Nuclear Regulatory Commission (NRC), Division of Site Safety and Environmental Analysis. The study effort was funded jointly by ERDA (Contract No. EY-76-C-02-2477) and NRC (Contract No. AT(49-24)-0351).

The current series includes investment cost reports for a Pressurized Water Reactor Plant, a Boiling Water Reactor Plant, High Sulfur Coal Plants, and Low Sulfur Coal Plants. The Oil Fired Power Plant Study was not updated because utilities are no longer expected to build significant numbers of these plants, and the High Temperature Gas-Cooled Reactor Plant Study was not updated because these reactors are not now being marketed. Investment cost reports on multi-unit stations and for different cooling system types are included. In addition, the series addresses fuel supply investment costs and total generating costs for both nuclear and coal - fired power plants.

Following is a list of the report titles and funding agency(ies) responsible for each:

Funding Agency(ies)	Report Titles
ERDA	Capital Cost - Pressurized Water Reactor Plant (NUREG-0241, COO-2477-5)
ERDA/NRC	Capital Cost - Boiling Water Reactor Plant (NUREG-0242, COO-2477-6)
ERDA/NRC	Capital Cost - High and Low Sulfur Coal Plants - 1200 MWe (NUREG-0243, COO-2477-7)
NRC/ERDA	Capital Cost - Low and High Sulfur Coal Plants - 800 MWe (NUREG-0244, COO-2477-8)
ERDA	Capital Cost Addendum - Multi-Unit Coal and Nuclear Stations (NUREG-0245, COO-2477-9)
NRC	Fuel Supply Investment Cost - Coal and Nuclear (NUREG-0246, COO-2477-10)
NRC	Cooling Systems Addendum - Capital and Total Generating Cost Studies (NUREG-0247, COO-2477-11)
NRC	Total Generating Costs - Coal and Nuclear Plants (NUREG-0248, COO-2477-12)

The studies in these series have a uniform set of economic and technical criteria and a uniform accounting system as contained in (Guide for Economic Evaluation of Nuclear Reactor Plant Designs, NUS-531, January 1969). The investment cost estimates in these series are developed for reference plants constructed at a hypothetical site called "Middletown, USA".

The reference investment and total generating cost estimates can be used for baseline comparisons of different generating systems. However, the major use of the investment cost data is as input to the CONCEPT computer code which was developed for ERDA at the Oak Ridge National Laboratory (ORNL). The CONCEPT computer program adjusts the baseline cost estimates contained in these studies for different plant sizes, regional variations in material and craft labor rates, different construction schedule lengths, and different escalation and interest rates. These adjustments result in preliminary sets of alternative cost estimates for electric power plants constructed anywhere in the United States.

PREFACE

The capital cost of the six commercial electric power plants in this series of studies, utilized mechanical draft evaporative cooling tower systems for condenser heat removal. This cooling system addendum to these studies present the costs and design descriptions of alternate cooling systems.

The baseline construction costs for the plants with alternate cooling system costs are summarized in Section 1.

The design description and cost estimates contained in Section 2 is divided into seven parts. The first part presents data on the alternate cooling systems designed for use with the 1200 MWe Pressurized Water Reactor Plant (PWR). The next five parts present similiar information for the 1200 MWe Boiling Water Reactor Plant, (BWR), the 1200 MWe High and Low Sulfur Coal Plants, and the 800 MWe Low and High Sulfur Coal Plants, respectively. The seventh part contains an expansion of cost estimates for Accounts 23 Turbine Plant Equipment; and Account 24, Electric Plant Equipment for the three alternate types of cooling tower systems: Once-Through Cooling, Fan-Assisted Natural Draft and Natural Draft, respectively, used with the aforementioned PWR, BWR and coal-fired plants.

Section 3 describes an example and procedure for using the data presented in these studies, in conjunction with Total Generating Costs: Coal and Nuclear Plants (NUREG-0248, COO-2477-12), to develop total generating costs for the plants that incorporate these alternate cooling systems.

SECTION 1 - TABLE LIST

SECTION 2 - FIGURE AND TABLE LIST

SECTION 3 - TABLE LIST

SECTION 1

SUMMARY

SECTION 1
SUMMARY

1.1 INTRODUCTION

These studies present the capital and total generating costs for alternate cooling systems designed for the six power plants:

1. 1200 MWe, Pressurized Water Reactor Plants
2. 1200 MWe, Boiling Water Reactor Plants
3. 1200 MWe, High Sulfur Coal-Fired plants
4. 1200 MWe, Low Sulfur Coal-Fired plants
5. 800 MWe, Low Sulfur Coal-Fired plants
6. 800 MWe, High Sulfur Coal-Fired plants

In these base capital cost studies, as referenced in subsection 2.9 all of the plants are designed using mechanical draft evaporative towers. Alternate cooling systems evaluated and presented in this report include:

a. Once-Through
b. Fan-Assisted Natural Draft Towers
c. Natural Draft Towers

These alternate cooling systems represent viable designs from both an economic and engineering standpoint. Other condenser cooling systems, including dry towers, wet-dry tower, cooling ponds and spray ponds, are not included in these studies. Dry and wet dry cooling towers have seen little use due to the large land requirements and high cost associated

with these systems. Typically, the use of dry and wet dry cooling towers are utilized only when water availability prohibit the use of the evaporative systems. Cooling ponds and spray ponds typically have large land requirements, and are cost-effective only when the site is conducive to their use.

1.2 COST SUMMARY

The estimated total base construction costs for the six plants incorporating the alternate cooling systems, are summarized in Table 1-1. The capital cost and fuel cost multipliers are presented in Table 1-2. These multipliers are given for all six plants incorporating the alternate cooling systems. Capital cost and fuel cost vary with each cooling system as compared to the base case: i.e., Mechanical Draft Evaporative Towers. An example illustrating the method of using the multipliers is shown in subsection 3.2. These cost estimates do not include the normal contingency costs for the equipment, material and labor components of the total base construction cost; nor do they include escalation and interest during construction.

The once-through cooling systems have the lowest capital cost of the alternate systems evaluated. In addition, a larger plant output is realized due to the lower operating turbine back pressure and lower auxiliary requirements. Lack of suitable sites to supply the large amount of water for the once-through cooling system preclude future wide spread use.

All of the cooling tower systems were designed at the same design temperatures. Differences in the total base construction costs for the alternate cooling tower systems are small. However, operating difference at off-design ambient temperatures, especially in the case of the natural draft system, result in different generator outputs at the average yearly ambient condition.

Figure 1-1, contained in this section, illustrates the year-around temperature duration curves for the dry bulb temperature and coincident wet bulb temperatures. The winters in the hypothetical Middletown site are moderately cold, with an average temperature in the low 30's. The summers are fairly humid with average temperatures in the low 70's, and with high temperatures averaging around 82F. The historic maximum wet bulb and dry bulb temperatures are 78F and 99F respectively.

Electrical outputs at the yearly average ambient temperature, in MWe, as well as other pertinent data for all cooling systems evaluated are presented on Tables 3-1 thru 3-6.

As noted in the Foreword, for each specific site, these baseline cost estimates must be adjusted for regional variations in material and labor rates, different construction schedule lengths, including escalation and interest rates incurred during construction.

TABLE 1-1

TOTAL BASE CONSTRUCTION COST
INCORPORATING ALTERNATE COOLING SYSTEM
(10^6)

	Base Case[1]	Once-Through	Natural Draft	Fan-Assisted Natural Draft
1200 MWe Pressurized Water Reactor Plant	568.8	554.9	569.7	569.2
1200 MWe Boiling Water Reactor Plant	582.7	568.4	583.0	583.3
1200 MWe High Sulfur Coal Plant	465.5	453.5	467.4	467.0
1200 MWe Low Sulfur Coal Plant	402.8	390.8	404.7	404.3
800 MWe Low Sulfur Coal Plant	287.4	278.4	289.4	287.4
800 MWe High Sulfur Coal Plant	335.2	326.2	337.3	335.3

[1] Mechanical Draft Evaporative Towers

TABLE 1-2

TOTAL GENERATING COST MULTIPLIERS FOR ALTERNATE COOLING SYSTEMS

	Base Case(1)	Once-Through	Natural Draft	Fan-Assisted Natural Draft
1200 MWe Pressurized Water Reactor Plant				
Capital Cost Multiplier	Base	0.957	0.993	1.000
Fuel Cost Multiplier	Base	0.981	0.991	0.999
Operating and Maintenance Multiplier	Base	0.981	0.991	0.999
1200 MWe Boiling Water Reactor Plant				
Capital Cost Multiplier	Base	0.956	0.992	0.999
Fuel Cost Multiplier	Base	0.980	0.992	0.998
Operating and Maintenance Multiplier	Base	0.980	0.992	0.998
1200 MWe High Sulfur Coal Plant				
Capital Cost Multiplier	Base	0.959	0.997	1.002
Fuel Cost Multiplier	Base	0.984	0.993	1.000
Operating and Maintenance Multiplier	Base	0.984	0.993	1.000
1200 MWe Low Sulfur Coal Plant				
Capital Cost Multiplier	Base	0.956	0.997	1.003
Fuel Cost Multiplier	Base	0.985	0.993	0.999
Operating and Maintenance Multiplier	Base	0.985	0.999	0.999
800 MWe High Sulfur Coal Plant				
Capital Cost Multiplier	Base	0.962	1.001	1.000
Fuel Cost Multiplier	Base	0.989	0.995	1.000
Operating and Maintenance Multiplier	Base	0.989	0.995	1.000
800 MWe Low Sulfur Coal Plant				
Capital Cost Multiplier	Base	0.958	1.002	1.000
Fuel Cost Multiplier	Base	0.989	0.995	1.000
Operating and Maintenance Multiplier	Base	0.989	0.995	1.000

(1) Mechanical Draft Evaporative Towers

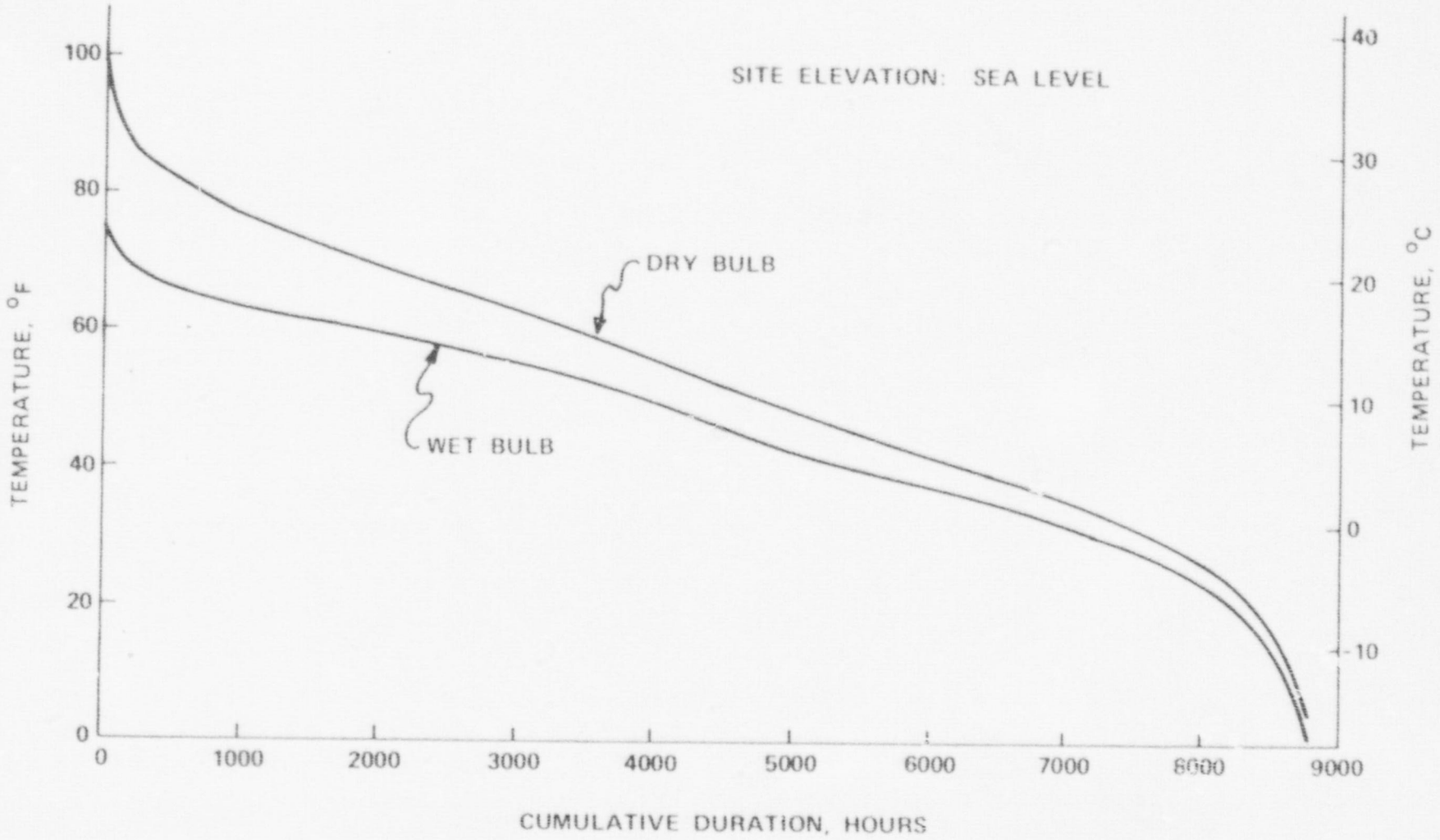

FIGURE 1-1 TEMPERATURE DURATION CURVES: MIDDLETOWN, U.S.A.

SECTION 2

COOLING SYSTEM DESCRIPTIONS

SECTION 2

COOLING SYSTEM DESCRIPTIONS

2.1 INTRODUCTION

This Section describes the alternate cooling systems design for the plant types covered by these alternate cooling system studies. The information presented is organized to correspond to the uniform system of accounts (USAEC Report NUS-531) used for the detailed cost estimate.

2.2 COOLING SYSTEM DESIGN CRITERIA

2.2.1 Major Study Ground Rules

In addition to the ground rules established for each of the plant types, the major criteria used in the cooling system evaluation are as follows:

- The once-through cooling systems are designed for a condenser temperature rise of 15 F and a maximum intake water velocity at the intake structure of 0.5 fps.
- All of the alternate tower systems are designed based on an 18 F approach to the 74 F wet bulb and a 26 F condenser temperature rise.

2.2.2 Turbine Plant and Electric Plant Modifications

Differences in electric plant costs between alternate cooling systems reflect design modifications to transformers switchgear and cable required by changes in the number, placement, and size of motors needed for system operation.

Although specific design descriptions for the turbine plant equipment are contained in subaccounts 233 for each plant, specific design descriptions for the electric plant modifications are not presented. Tables 2-19

through 2-42 present detailed costs for electric plant modifications with the exception of tables 2-19, -23, -27, -31, -34 and -39 which present cost details for the turbine plant, once-through cooling systems. Cost details for the two other cooling systems are identical to mechanical wet draft cooling systems.

2.2.3 Mechanical Draft Wet Tower (Design used in References 1 thru 5)

The mechanical draft wet towers are of the circular crossflow design. A typical tower is shown in Figure 2-1. Air flows through the fill or packing horizontally and at right angle to the flow of water. Drift eliminators are positioned vertically inside the tower to reduce the drift rate to 0.002 percent of the circulating water flowrate. Airflow is induced by fans positioned on top of the tower. Other tower design information is presented in the design descriptions for each plant.

General Descriptions of Alternative Cooling Devices - Once-Through Cooling System

In the once-through cooling system the flow of water from the river serves as the cooling medium. River water is pumped to the condensers by a set of pumps located at the intake structure. The water is then discharged back to the river. A de-icing system is provided to eliminate ice buildup on the traveling screens. The intake and discharge structures require special considerations because of the potential environmental impact related to the large quantity and temperature of the water required.

Natural Draft Towers

Figure 2-2 shows a typical natural draft tower of counterflow design. The hyperbolic concrete shell is supported at the bottom by reinforced concrete columns to allow the free flow of air. The water distribution

system, packing material, and the drift eliminators are located near the bottom of the tower behind the air inlet louvers. Additional information is provided in the design descriptions for each plant.

Fan-Assisted Natural Draft Towers

Figure 2-3 shows a fan-assisted natural draft wet tower with the fans located about the periphery of the tower base. This tower is of counterflow design. The water distribution system, packing material and the drift eliminators are located near the bottom of the tower behind the fans and are similar in design to those for the natural draft tower. Additional information on the tower design and operation is provided in the design descriptions for each plant.

2.3 PRESSURIZED WATER REACTOR (PWR) COOLING SYSTEMS

Design and cost data for the PWR alternate cooling systems are presented in this subsection. The heat load of the unit is $7.57(10)^9$ Btu/hr at a base turbine back pressure of 2.5 in HgA.

2.3.1 Once-Through Cooling System Design Description

Following are the PWR once-through system design descriptions for Account 26 and other accounts impacted by a change from mechanical draft cooling towers to once-through cooling. Design descriptions for accounts not impacted by this change are presented in Reference 1.

Account 233 Condensing System

Condensing Equipment

Three condensers are used for the once-through cooling system. The three surface condensers are single stage one-pass design. The condensers are

designed to handle the total heat rejection from the main turbine and the two auxiliary turbine drives for the feedwater pumps. Each condenser has a condensing surface of 184,740 sq ft; 16,910 one and 1/8 inch diameter tubes, 37 ft long, and 20 BWG 90-10 CuNi. Cooling water flow in each condenser is 338,600 gpm resulting in a tube velocity of 7.25 ft/sec and a temperature rise at full load of 15 F.

The balance of the condensing equipment does not change and the equipment descriptions are presented in Reference 1.

ACCOUNT 261 Structures

Intake and Discharge Structures

The intake and discharge structures are Non-Seismic Category I, and are located along the riverbank west of the main plant structures. The intake basin is 194 ft long, 46 ft wide and 53 ft deep and is entirely below plant grade. The volume of the basin is approximately 473,000 cu ft. Attached to the north end of the structure is a service water pump basin founded 32 ft below grade. The structure is reinforced concrete with foundation mat bearing on rock. There are six circulating water pumps supported from the reinforced concrete basin roof slab. The intakes are protected by bar racks, trash rakes, stop logs, traveling screens and a trash pit. Fish escapes are also provided. A channel is excavated in the river bottom from the ship channel to the intake structure to ensure an adequate supply of water during low tide conditions. Interior walls are of reinforced masonry concrete. Portions of the operating floor are

grated. A 750 sq ft electrical equipment room 13 ft high is located at grade adjacent t the basin.

The hot circulating water is discharged back to the river through a discharge canal. Discharge occurs sufficiently downstream of the intake to minimize recirculation.

Circulating Water Discharge Tunnel and Canal

The circulating water discharge tunnel begins in the turbine building at the condenser outlets and runs outside where it is channeled into the discharge canal. The tunnel is a reinforced concrete box structure 52 ft wide and 15 ft high inside.

The discharge canal is an extension of the tunnel which discharges into the North River 350 ft south of the intake structure. The canal is a reinforced concrete structure, with a flat bottom, vertical walls, and open top. The canal is 52 ft wide with walls 21 ft high. At the river, the canal widens, and the bottom slopes up to ensure sufficient water in the canal at all times for maintaining a seal for the circulating water system.

ACCOUNT 262 Mechanical Equipment

Circulating Water Pumps

There are six 16.7 percent capacity circulating water pumps, of the mixed flow vertical type. Each pump is designed for a flow rate of 169,300 gpm with a total dynamic head of 27 ft. Circulating water pump motors are 1,500 hp each, operating at a synchronous speed of 300 rpm. The pumps

discharge the water to the main condensers, where heat is absorbed. The water is then discharged through a tunnel and canal, and back to the river.

Circulating Water Intake System

Twelve traveling screens are provided to remove twigs, leaves and other debris from the river water that may otherwise enter the system and restrict the flow of water in the condenser tubes. The traveling screens are 14 ft wide by 48 ft long. They are sized to give a water velocity of 0.5 ft/sec at mean low water. Serving the traveling screens are two 100 percent capacity screen wash pumps with a flow rate of 3600 gpm and a total dynamic head of 100 ft to wash the screens when they require cleaning. Vertical trash racks with an automatic rake are provided ahead of the traveling screens.

Each screen well is provided with stop logs to allow dewatering (two screens and one pump) for maintenance purposes. In order to protect the traveling screens against ice during freezing water conditions, two vertical de-icing motor driven pumps, each designed for a flowrate of 30,500 gpm at 35 ft head, are used to pump warm water from the condenser discharge to the screens.

2.3.2 Natural Draft Towers

ACCOUNT 26 MAIN CONDENSER HEAT REJECTION SYSTEM

ACCOUNT 261 Structures

All of the structures required for the natural draft tower are of identical design to those designed for the mechanical draft towers. Design

descriptions for the makeup water intake and discharge structures, circulating water pumphouse and makeup water pretreatment building, are presented in the mechanical draft wet tower system description.

ACCOUNT 262 Mechanical Equipment

There are four 25 percent capacity circulating water pumps, of the mixed flow vertical type. Each pump is designed for a flow rate of 147,500 gpm with a total dynamic head of 121 ft. Circulating water pump motors are 5,500 hp each, operating at a synchronous speed of 320 rpm.

Cooling Towers

There is one natural draft wet cooling tower designed to cool the entire circulating water flow of 588,000 gpm from 118 F to 92 F when operating at a wet bulb and dry bulb temperature of 74 F and 93 F. To provide the draft required for airflow, the tower employs a reinforced concrete hyperbolic shell 571 ft high. At the base the diameter is 441 ft. The tower's foundation is of the spread-footing type. The tower employs components for water distribution, fill splash service, reinforced concrete fill support and drift eliminators. Walkways, access ladders, railing, aircraft warning lights and a lightning protection system are also provided.

The hot water is fed into a network of distribution pipes, which are evenly spaced throughout the interior of the tower. The flow from these pipes is sent downwards through a system of nozzles and splash plates which spray the water to form a thin film over the heat exchanger surfaces. The distribution system is divided into quadrants to allow one quarter of the tower to be removed from service with the full flow distributed over the remainder of the tower.

Main Cooling Tower Makeup and Blowdown Systems

The makeup water requirements are the same for the natural draft tower as the mechanical draft towers. This allows the use of identical makeup and blowdown systems, as designed for the mechanical draft tower.

2.3.3 Fan-Assisted Natural Draft Towers

ACCOUNT 26 MAIN CONDENSER HEAT REJECTION SYSTEM

ACCOUNT 261 Structures

All of the structures required for the fan-assisted natural draft towers are of identical design to those designed for the mechanical draft towers. Design descriptions for the makeup water intake and discharge structures, circulating water pumphouse and makeup water pretreatment building, are presented in the mechanical draft wet tower system description.

ACCOUNT 262 Mechanical Equipment

Circulating Water Pumps

There are four 25 percent capacity circulating water pumps of the mixed flow vertical type. Each pump is designed for a flowrate of 147,500 gpm with a total dynamic head of 105 ft. Circulating water pump motors are 5,000 hp each, operating at a synchronous speed of 320 rpm.

Cooling Towers

There are two fan-assisted natural draft wet cooling towers each sized for one half of the requirements. Each tower is designed to cool 294,000 gpm of water from 118 F to 92 F when operating at a wet bulb of 74 F.

Each tower has a base diameter of 257 ft and an overall height of 205 ft. Twenty-four, 28 ft diameter fans are positioned about the periphery of each tower's base. Two-speed fan motors are provided to allow constant control of the temperature of cold water from the towers over a wide range of plant loads and weather conditions. The tower foundations are of the spread-footing type. The towers employ components for water distribution, fill splash service, reinforced concrete fill support and drift eliminators.

The hot water is fed into a network of distribution pipes, that are evenly spaced throughout the interior of each tower. The flow from these pipes is sent downwards through a system of nozzles and splash plates which spray the water to form a thin film over the heat exchanger surfaces. The distribution system in each tower is divided into quadrants in order to allow one quarter of a tower to be removed from services, with the full flow distributed over the remainder of the tower.

Main Cooling Tower Makeup and Blowdown Systems

The makeup water requirements are the same for the fan-assisted natural draft towers as the mechanical draft towers. This allows the use of identical makeup and blowdown systems as designed for the mechanical draft tower.

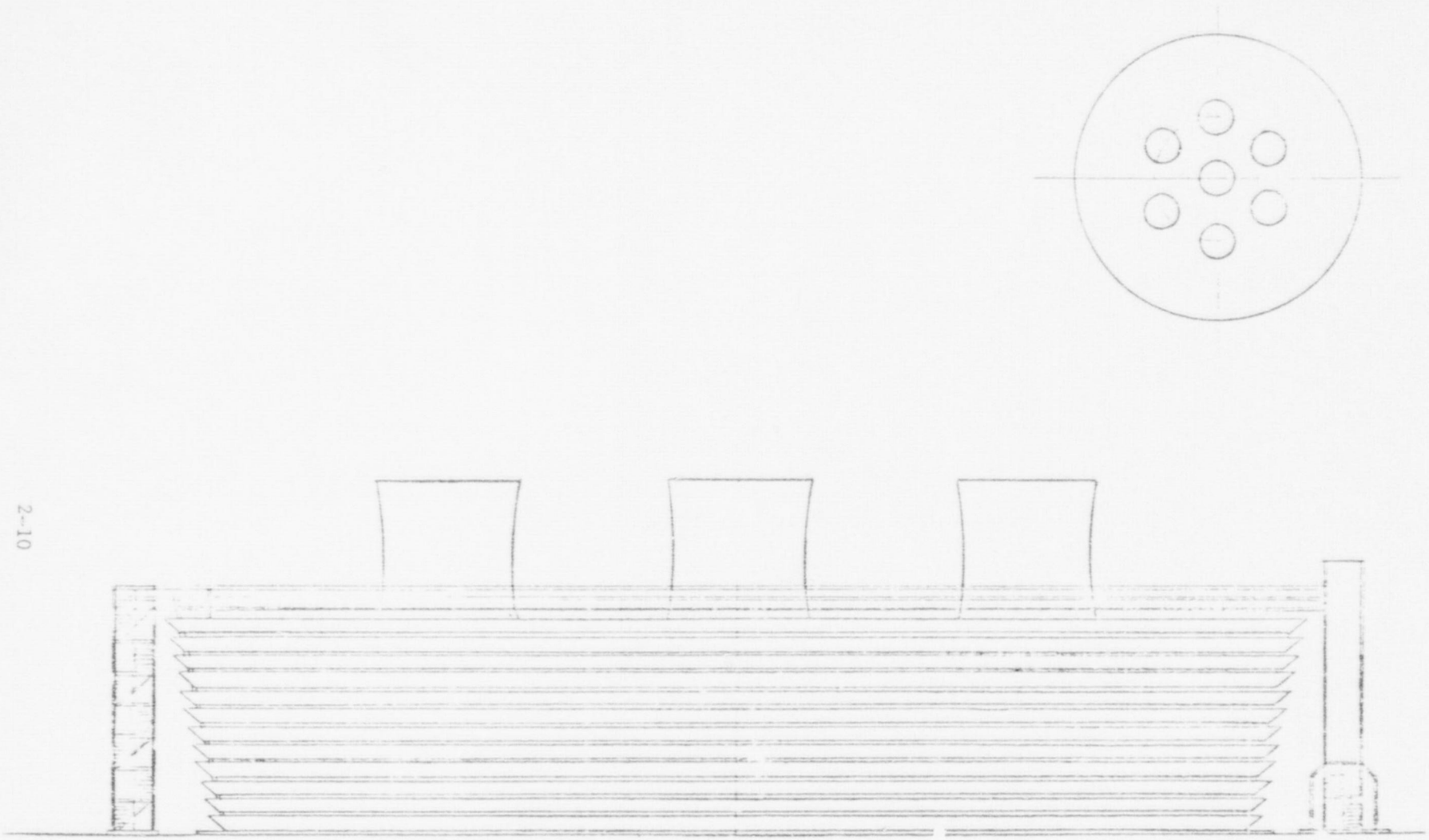

Figure 2-1 Typical Circular Mechanical Draft Tower

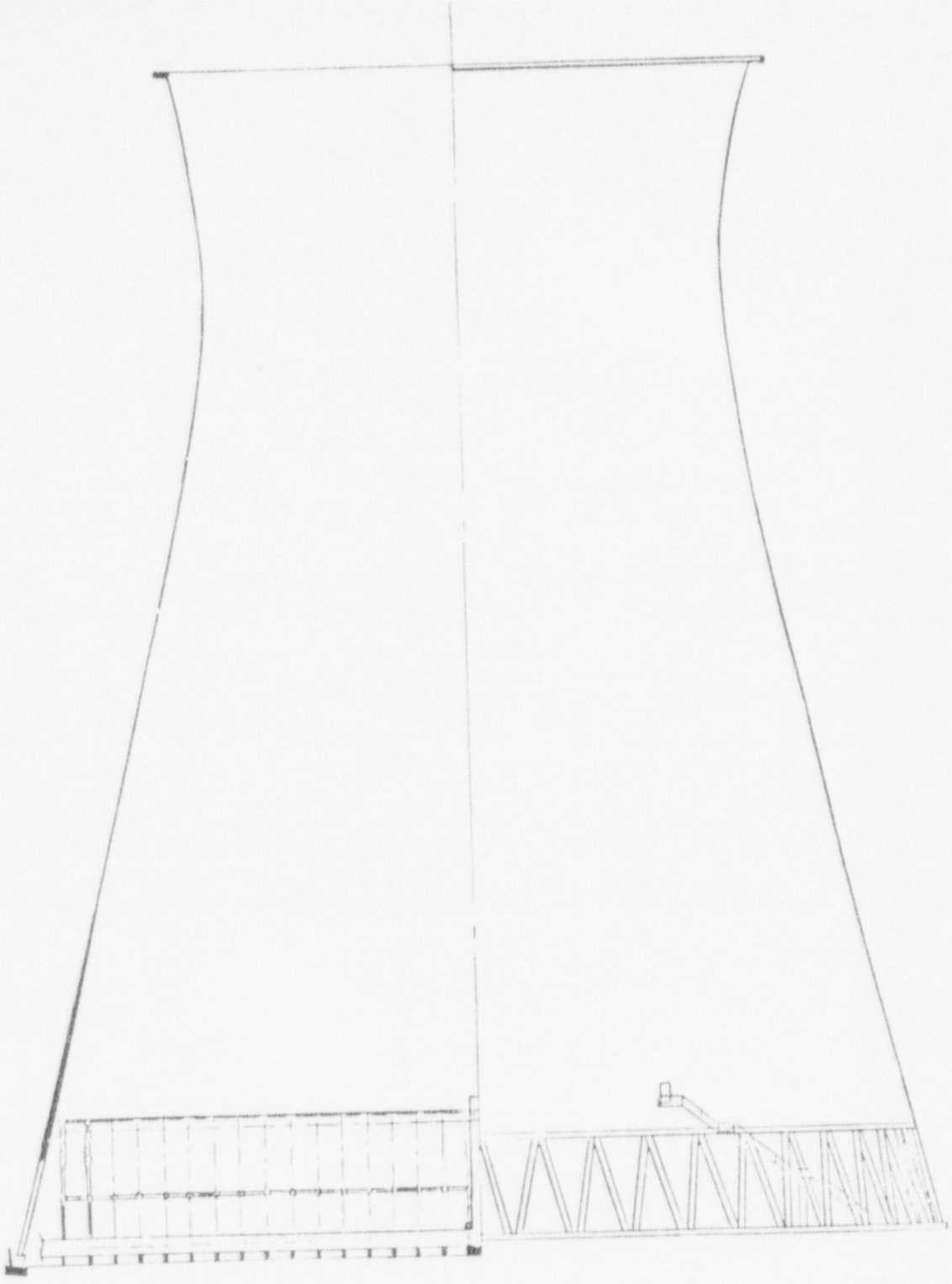

Figure 2-2 Typical Natural Draft Counter Flow Cooling Tower

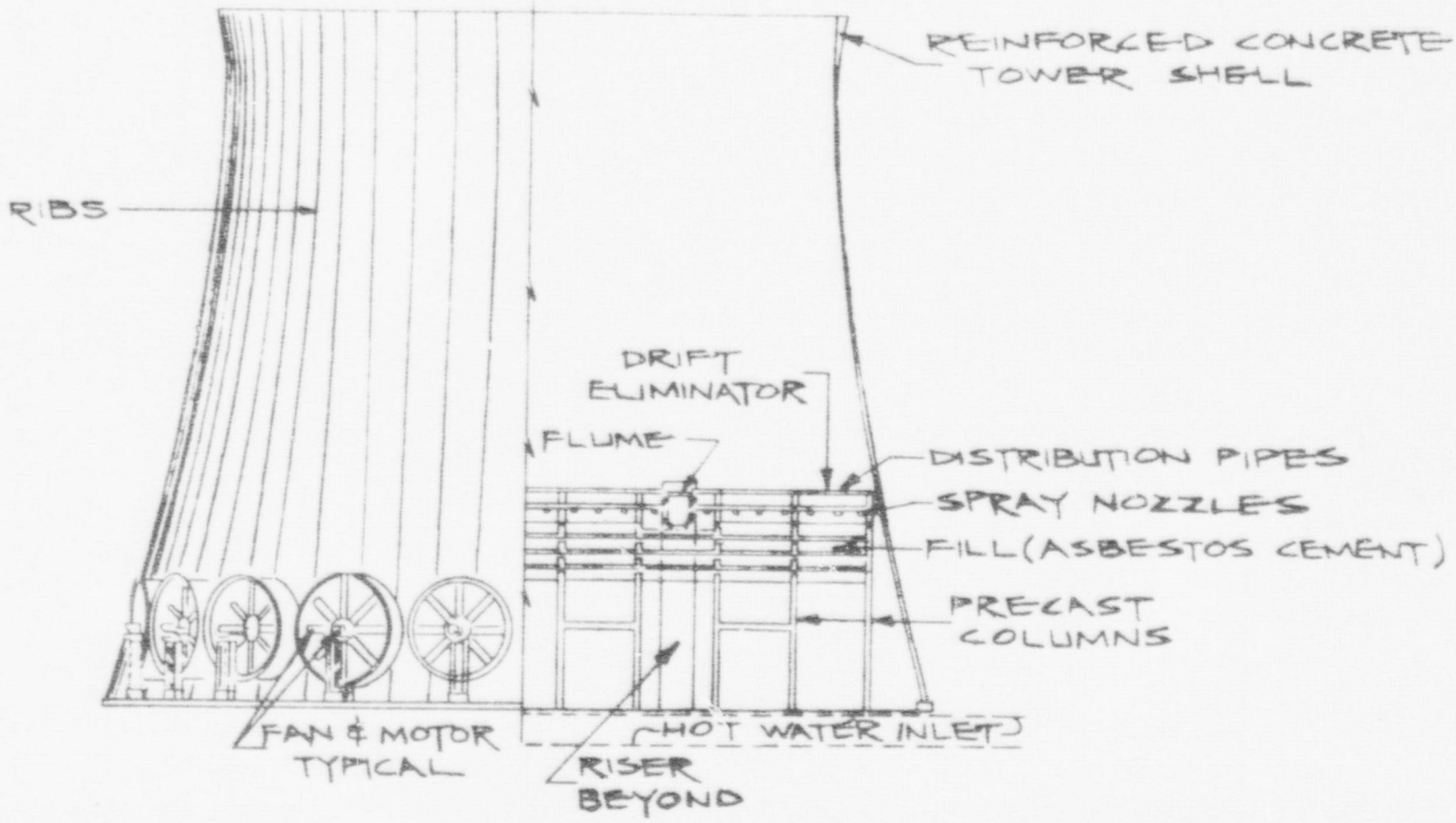

Figure 2-3 Typical Fan-Assisted Natural Draft Wet Cooling Tower

TABLE 2-1

PLANT CODE 199 | COST BASIS 07/76

COST ESTIMATE - 1200 MWe PRESSURIZED WATER REACTOR
ONCE-THROUGH COOLING SYSTEM

03/01/78

ACCT NO.	ACCOUNT DESCRIPTION	FACTORY QUANTITY	FACTORY COSTS	SITE QUANTITY	SITE LABOR HRS	SITE LABOR COST	SITE MATERIAL COST	TOTAL COSTS
2 .	TOTAL DIRECT COSTS							
20 .	LAND AND LAND RIGHTS			1 LT			2,000,000	
21 .	STRUCTURES + IMPROVEMENTS	1 LT	5,902,430	1 LT	4716266 MH	55,696,710	39,776,620	
22 .	REACTOR PLANT EQUIPMENT	1 LT	96,568,790	1 LT	2145880 MH	27,768,660	9,142,990	
23 .	TURBINE PLANT EQUIPMENT*	1 LT	80,929,270	1 LT	1804030 MH	23,028,820	5,284,800	
24 .	ELECTRIC PLANT EQUIPMENT *	1 LT	12,460,450	1 LT	1364782 MH	16,751,510	8,031,310	
25 .	MISCELLANEOUS PLANT EQUIPT	1 LT	7,197,437	1 LT	307827 MH	3,959,426	646,560	
26 .	MAIN COND HEAT REJECT SYS							
261.	STRUCTURES							
261.1	MAKEUP WTR INT + DISCH STR							
261.11	INTAKE STRUCTURE							
261.111	EXCAVATION WORK							
261.1111	EARTH EXCAVATION			3550 CY	888 MH	10,381	3,550	
261.1112	ROCK EXCAVATION			14710 CY	11768 MH	137,567	58,840	
261.1113	SHEETING (TEMP COFFERDAM)			140 TN	2800 MH	38,416	23,800	
261.1114	STRCT STL (TEMP COFFERDAM)							
261.1115	PUMPING			1 LT	8000 MH	74,560	75,000	
	261.111 EXCAVATION WORK				23456 MH	260,924	161,190	422,114
261.112	BEARING PILES (STEEL)							
261.113	SUBSTRUCTURE CONCRETE							
261.1131	FORMWORK			87000 SF	69600 MH	768,551	87,000	

* Detailed cost breakdown for these accounts are found Tables 2-19 and 2-20 respectively

TABLE 2-1

PLANT CODE 199 | COST BASIS 07/76 | COST ESTIMATE - 1200 MWe PRESSURIZED WATER REACTOR OSCE-THROUGH COOLING SYSTEM

03/01/78

ACCT NO.	ACCOUNT DESCRIPTION	FACTORY QUANTITY	FACTORY COSTS	SITE QUANTITY	SITE LABOR HRS	SITE LABOR COST	SITE MATERIAL COST	TOTAL COSTS
261.1132	REINFORCING STEEL			368 TN	12880 MH	166,322	147,200	
261.1133	CONCRETE			4900 CY	8575 MH	87,567	171,500	
261.1134	EMBEDDED STEEL			24 TN	3600 MH	43,297	36,000	
261.1135	CONCRETE FINISH			49000 SF	980 MH	10,008	490	
261.1136	WATERPROOFING							
261.1137	CONSTRUCTION JOINTS			1107 SF	1107 MH	12,223	1,107	
261.1138	RUBBING CONCRETE SURFACES							
	261.113 SUBSTRUCTURE CONCRETE				96742 MH	1,087,968	443,297	1,531,265
261.114	SUPERSTRUCTURE							
261.1141	CONCRETE WORK							
261.1142	STRUCTURAL + MISC. STEEL							
261.11421	STRUCTURAL STEEL							
261.11422	GRATING (GALV)			1115 SF	222 MH	2,892	3,345	
261.11423	HANDRAIL			250 LF	188 MH	2,446	2,500	
	261.1142 STRUCTURAL + MISC. STEEL				410 MH	5,338	5,845	11,183
261.1143	EXTERIOR WALLS							
261.11431	CONCRETE							
261.11432	MASONRY			1375 SF	344 MH	3,925	3,850	
	261.1143 EXTERIOR WALLS				344 MH	3,925	3,850	7,775
261.1144	ROOF DECK							
261.11441	METAL ROOF DECK			750 SF	60 MH	782	750	

ACCT NO.	ACCOUNT DESCRIPTION	FACTORY QUANTITY	FACTORY COSTS	SITE QUANTITY	SITE LABOR HRS	SITE LABOR COST	SITE MATERIAL COST	TOTAL COSTS
	261.1144 ROOF DECK				60 MH	782	750	1,532
261.1145	ROOFING + FLASHING							
261.11451	B.U. ROOFG, INSULTN, + FLA			750 SF	53 MH	714	938	
	261.1145 ROOFING + FLASHING				53 MH	714	938	1,652
261.1146	INTERIOR WALLS							
261.11461	CONCRETE WALLS							
261.11462	MASONRY WALLS			250 SF	60 MH	685	700	
261.11463	PARTITIONS							
	261.1146 INTERIOR WALLS				60 MH	685	700	1,385
261.1147	DOORS + WINDOWS							
261.11471	ROLLING STEEL DOORS			100 SF	60 MH	782	1,400	
261.11472	PERSONNEL DOORS			98 SF	77 MH	893	1,152	
261.11473	SASH + GLAZING							
	261.1147 DOORS + WINDOWS				137 MH	1,675	2,552	4,227
261.1149	PAINTING							
261.11491	CONCRETE							
261.11492	STEELWORK			24 TN	120 MH	1,148	144	
261.11493	METAL DECK			750 SF	15 MH	144	150	
261.11494	HANDRAIL			250 LF	50 MH	479	25	
	261.1149 PAINTING				185 MH	1,771	319	2,090

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ACCT NO.	ACCOUNT DESCRIPTION	FACTORY QUANTITY	FACTORY COSTS	SITE QUANTITY	SITE LABOR HRS	SITE LABOR COST	SITE MATERIAL COST	TOTAL COSTS
	261.114 SUPERSTRUCTURE				1249 MH	14,890	14,954	29,844
261.117	BULKHEAD							
261.1171	STEEL SHEETING			70 TN	700 MH	9,604	24,500	
261.1172	STRUCTURAL STEEL			4 TN	80 MH	1,040	3,000	
261.1173	GRAVEL FILL							
261.1174	DREDGING			20885 CY	4177 MH	52,129	41,770	
261.1175	RIP-RAP (12 IN. THICK)			240 CY	360 MH	3,583	2,400	
261.1176	CHAIN LINK FENCE(7FT HIGH)			440 LF	132 MH	1,230	2,860	
	261.117 BULKHEAD				5449 MH	67,586	74,530	142,116
261.118	PROTECTIVE DOLPHINS							
261.1181	WOOD PILES			2750 LF	550 MH	7,546	11,000	
	261.118 PROTECTIVE DOLPHINS				550 MH	7,546	11,000	18,546
261.119	BUILDING SERVICES							
261.1191	PLUMBING + DRAINS			5 EA	625 MH	8,099	5,000	
261.1192	HEATING + VENTILATING	1 LT	3,400	1 LT	193 MH	2,494	249	
261.1193	LIGHTING + SERVICE POWER			750 SF	226 MH	2,779	1,350	
	261.119 BUILDING SERVICES		3,400		1044 MH	13,372	6,599	23,371
	261.11 INTAKE STRUCTURE		3,400		12849C MH	1,452,286	711,570	2,167,256
	261.1 MAKEUP WTR INT + DISCH STR		3,400		12849C MH	1,452,286	711,570	2,167,256
261.4	CHLORINATION BUILDING							

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ACCT NO.	ACCOUNT DESCRIPTION	FACTORY QUANTITY	FACTORY COSTS	SITE QUANTITY	SITE LABOR HRS	SITE LABOR COST	SITE MATERIAL COST	TOTAL COSTS
261.41	BUILDING STRUCTURE							
261.411	EXCAVATION WORK							
261.4111	EARTH EXCAVATION			53 CY	13 MH	140	53	
261.4114	BACKFILL			41 CY	12 MH	118	41	
	261.411 EXCAVATION WORK				25 MH	258	94	352
261.413	SUBSTRUCTURE CONCRETE							
261.4131	FORMWORK			216 SF	173 MH	1,910	216	
261.4132	REINF.STEEL			2 TN	71 MH	917	800	
261.4133	CONCRETE			12 CY	21 MH	213	420	
261.4134	EMBEDDED STEEL							
261.4135	FLOOR FINISH			105 SF	1 MH	9	1	
261.4136	WATERPROOFING							
261.4137	CONSTRUCTION JOINTS			5E SF	5C MH	552	50	
261.4138	RUBBING CONCRETE SURFACES							
261.4139	WIRE FABRIC			105 SF	2 MH	27	13	
	261 413 SUBSTRUCTURE CONCRETE				31E MH	3,628	1,500	5,128
261.414	SUPERSTRUCTURE							
261.4141	CONCRETE WORK							
261.4142	STRUCT. + MISC. STEEL							
261.41421	STRUCT. STEEL							
261.41423	MISC. FRAMES, ETC.			2 TN	120 MH	1,564	2,400	

ACCT NO.	ACCOUNT DESCRIPTION	FACTORY QUANTITY	FACTORY COSTS	SITE QUANTITY	SITE LABOR HRS	SITE LABOR COST	SITE MATERIAL COST	TOTAL COSTS
	261.4142 STRUCT. + MISC. STEEL				120 MH	1,564	2,400	3,964
261.4143	EXTERIOR WALLS							
261.41432	MASONRY			310 SF	78 MH	890	868	
	261.4143 EXTERIOR WALLS				78 MH	890	868	1,758
261.4144	ROOF DECK							
261.41441	METAL ROOF DECK			170 SF	13 MH	171	170	
	261.4144 ROOF DECK				13 MH	171	170	341
261.4145	ROOFING + FLASHING							
261.41451	B.U.ROOFING,FLASHING+INSUL			170 SF	12 MH	162	213	
	261.4145 ROOFING + FLASHING				12 MH	162	213	375
261.4147	DOORS + WINDOWS							
261.41472	PERSONNEL DOORS			50 SF	40 MH	464	600	
261.41473	SASH + GLAZING			25 SF	13 MH	151	300	
	261.4147 DOORS + WINDOWS				53 MH	615	900	1,515
261.4149	PAINTING							
261.41492	STEELWORK			2 TN	10 MH	96	12	
261.41493	METAL DECK			170 SF	3 MH	29	17	
	261.4149 PAINTING				13 MH	125	29	154
	261.414 SUPERSTRUCTURE				286 MH	3,527	4,580	8,107

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ACCT NO.	ACCOUNT DESCRIPTION	FACTORY QUANTITY	FACTORY COSTS	SITE QUANTITY	SITE LABOR HRS	SITE LABOR COST	SITE MATERIAL COST	TOTAL COSTS
	261.41 BUILDING STRUCTURE				632 MH	7,413	6,174	13,587
261.424	LIGHTING + SERVICE POWER							
	261.4 CHLORINATION BUILDING				632 MH	7,413	6,174	13,587
261.5	DISCHARGE TUNNEL + CANAL							
261.51	EXCAVATION							
261.511	EARTH EXCAVATION			26300 CY	6575 MH	70,421	26,300	
261.512	ROCK EXCAVATION			38300 CY	30640 MH	328,168	153,200	
261.514	BACKFILL			13050 CY	3915 MH	41,932	13,050	
261.515	DEWATERING							
	261.51 EXCAVATION				41130 MH	440,521	192,550	633,071
261.53	SUBSTRUCTURE CONCRETE							
261.531	FORMWORK			120580 SF	96465 MH	1,065,205	120,580	
261.532	REINFORCING STEEL			953 TN	33355 MH	430,723	381,200	
261.533	CONCRETE			12700 CY	22225 MH	226,962	444,500	
261.534	EMBEDDED STEEL							
261.535	FLOOR FINISH							
261.536	WATERPROOFING							
261.537	CONSTRUCTION JOINTS			6736 SF	6735 MH	74,370	6,736	
261.538	RUBBING CONCRETE SURFACES							
	261.53 SUBSTRUCTURE CONCRETE				158780 MH	1,797,260	953,016	2,750,276
	261.5 DISCHARGE TUNNEL + CANAL				199910 MH	2,237,781	1,145,566	3,383,347

TABLE 2-1

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ACCT NO.	ACCOUNT DESCRIPTION	FACTORY QUANTITY	FACTORY COSTS	SITE QUANTITY	SITE LABOR HRS	SITE LABOR COST	SITE MATERIAL COST	TOTAL COSTS
	261. STRUCTURES		3,400		329032 MH	3,697,480	1,863,310	5,564,190
262.	MECHANICAL EQUIPMENT							
262.1	HEAT REJECTION SYSTEM							
262.11	WATER INTAKE EQUIPMENT							
262.111	ROTATING MACHINERY							
262.1111	SCREEN WASH PUMP+MOTOR	2 EA	34,400	1 LT	700 MH	9,252	925	
262.11111	SCREEN WASH PUMP							
262.11112	SCREEN WASH PUMP MOTOR							
	262.1111 SCREEN WASH PUMP+MOTOR		34,400		700 MH	9,252	925	44,577
	262.111 ROTATING MACHINERY		34,400		700 MH	9,252	925	44,577
262.114	PURIFICATION+FILTRATION EQ							
262.1141	TRAVELING SCREENS							
262.11411	CIRCULATING WATER PUMPS	12 EA	740,400	1 LT	2040C MH	263,913	26,391	
262.11412	SCREEN WASH PUMPS	2 EA	64,000	1 LT	600 MH	7,761	776	
	262.1141 TRAVELING SCREENS		804,400		21000 MH	271,674	27,167	1,103,241
262.1142	TRASH RACK	13 EA	148,200	1 LT	4355 MH	56,692	5,669	
262.1143	TRASH RAKE	1 LT	42,000	1 LT	800 MH	10,350	1,035	
262.1144	STOP LOGS							
262.11441	CIRCULATING WATER PUMPS			324 EA	4860 MH	45,295	10,530	

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ONCE-THROUGH COOLING SYSTEM

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ACCT NO.	ACCOUNT DESCRIPTION	FACTORY QUANTITY	FACTORY COSTS	SITE QUANTITY	SITE LABOR HRS	SITE LABOR COST	SITE MATERIAL COST	TOTAL COSTS
262.11442	SCREEN WASH PUMPS			54 EA	540 MH	5,033	972	
	262.1144 STOP LOGS				5400 MH	50,328	11,502	61,830
	262.114 PURIFICATION+FILTRATION EQ		994,600		31555 MH	389,044	45,373	1,429,017
262.115	PIPING-SCREEN WASH							
262.1151	2 IN. + SMALLER							
262.1152	2.5 IN. + LARGER							
262.11521	CS/NNS	29060 LB	43,590	1 LT	6975 MH	90,400	9,040	
	262.1152 2.5 IN. + LARGER		43,590		6975 MH	90,400	9,040	143,030
	262.115 PIPING-SCREEN WASH		43,590		6975 MH	90,400	9,040	143,030
262.116	VALVES-SCREEN WASH	1 LT	27,600					
262.1162	CHECK							
262.1166	BUTTERFLY							
	262.116 VALVES-SCREEN WASH		27,600					27,600
262.117	PIPING-MISC ITEMS							
262.1171	HANGERS + SUPPORTS	4360 LB	6,540					
262.1172	INSULATION							
262.1173	SPECIALTIES							
	262.117 PIPING-MISC ITEMS		6,540					6,540
	262.11 WATER INTAKE EQUIPMENT		1,106,730		39230 MH	488,696	55,338	1,650,764

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ONCE-THROUGH COOLING SYSTEM

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ACCT NO.	ACCOUNT DESCRIPTION	FACTORY QUANTITY	FACTORY COSTS	SITE QUANTITY	SITE LABOR HRS	SITE LABOR COST	SITE MATERIAL COST	TOTAL COSTS
262.12	CIRCULATING WATER SYSTEM							
262.121	ROTATING MACHINERY							
262.1211	CIRCULATING WATER PUMP+MTR	6 EA	1,590,000	1 LT	19320 MH	255,349	25,535	
262.12111	CIRC WATER PUMP							
262.12112	CIRC WATER PUMP MOTOR							
	262.1211 CIRCULATING WATER PUMP+MTR		1,590,000		19320 MH	255,349	25,535	1,870,884
	262.121 ROTATING MACHINERY		1,590,000		19320 MH	255,349	25,535	1,870,884
262.125	PIPE							
262.1251	2 IN + SMALLER							
262.1252	2.5 IN + LARGER							
262.12521	CONCRETE/NNS	2487 LF	711,158	1 LT	9500 MH	121,752	12,175	
262.12522	CS/NNS	122040 LB	183,060	1 LT	29290 MH	379,608	37,961	
	262.1252 2.5 IN + LARGER		894,218		38790 MH	501,360	50,136	1,445,714
	262.125 PIPE		894,218		38790 MH	501,360	50,136	1,445,714
262.126	VALVES							
262.1266	BUTTERFLY	18 EA	416,358	1 LT	1979 MH	25,652	2,565	
	262.126 VALVES		416,358		1979 MH	25,652	2,565	444,575
262.127	PIPING / MISC. ITEMS							
262.1271	HANGERS + SUPPORTS							

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COST ESTIMATE - 1200 MWe PRESSURIZED WATER REACTOR
ONCE-THROUGH COOLING SYSTEM

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ACCT NO.	ACCOUNT DESCRIPTION	FACTORY QUANTITY	FACTORY COSTS	SITE QUANTITY	SITE LABOR HRS	SITE LABOR COST	SITE MATERIAL COST	TOTAL COSTS
262.1272	INSULATION							
262.1273	SPECIALTIES							
262.12731	EXPANSION JOINTS	1 LT	92,880	1 LT	82 MH	1,066	107	
	262.1273 SPECIALTIES		92,880		82 MH	1,066	107	94,053
262.1274	PIPE TRENCHING							
262.12741	EXCAVATION							
262.127411	EARTH EXCAVATION			16420 CY	4105 MH	43,966	16,420	
262.127412	ROCK EXCAVATION			13440 CY	10752 MH	115,159	53,760	
	262.12741 EXCAVATION				14857 MH	159,125	70,180	229,305
262.12742	BACKFILL			14890 CY	4467 MH	44,455	14,890	
262.12743	COMPACTED SAND BED			6510 CY	6510 MH	64,788	39,060	
262.12744	SUBSTRUCTURE CONCRETE							
262.127441	FORMWORK			6080 SF	4865 MH	53,722	6,080	
262.127442	REINF STEEL			56 TN	1960 MH	25,311	22,400	
262.127443	CONCRETE			750 CY	1313 MH	13,410	26,250	
	262.12744 SUBSTRUCTURE CONCRETE				8138 MH	92,443	54,730	147,173
	262.1274 PIPE TRENCHING				33972 MH	360,811	178,860	539,671
	262.127 PIPING / MISC. ITEMS		92,880		34054 MH	361,877	178,967	633,724
262.128	INSTRUMENTATION + CONTROL	1 LT	8,025	1 LT	60 MH	733	37	
262.129	SKIDS / FOUNDATIONS							

TABLE 2-1

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COST ESTIMATE - 1200 MWe PRESSURIZED WATER REACTOR
OSCE-THROUGH COOLING SYSTEM

ACCT NO.	ACCOUNT DESCRIPTION	FACTORY QUANTITY	FACTORY COSTS	SITE QUANTITY	SITE LABOR HRS	SITE LABOR COST	SITE MATERIAL COST	TOTAL COSTS
262.1291	CHLORINATION SYSTEM	1 LT	105,350	1 LT	2600 MH	33,636	3,364	
	262.129 SKIDS / FOUNDATIONS		105,350		2600 MH	33,636	3,364	142,350
	262.12 CIRCULATING WATER SYSTEM		3,106,831		96803 MH	1,178,607	260,604	4,546,042
262.16	DE-ICING SYSTEM							
262.161	ROTATING MACHINERY							
262.1611	DE-ICING PUMPS + MOTORS	2 EA	99,800	1 LT	1759 MH	23,248	2,325	
262.16111	DE-ICING PUMPS							
262.16112	DE-ICING PUMP MOTORS							
	262.1611 DE-ICING PUMPS + MOTORS		99,800		1759 MH	23,248	2,325	125,373
	262.161 ROTATING MACHINERY		99,800		1759 MH	23,248	2,325	125,373
262.165	PIPING							
262.1651	2 IN. + SMALLER							
262.1652	2.5 IN. + LARGER							
262.16521	CONCRETE	490 LF	11,647	1 LT	196 MH	2,511	251	
	262.1652 2.5 IN. + LARGER		11,647		196 MH	2,511	251	14,409
	262.165 PIPING		11,647		196 MH	2,511	251	14,409
262.166	VALVES	2 EA	17,640		79 MH	1,028		
262.167	EXCAVATION							
262.1671	EARTH EXCAVATION			2185 CY	546 MH	5,847	2,185	

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COST ESTIMATE - 1200 MWe PRESSURIZED WATER REACTOR
ONCE-THROUGH COOLING SYSTEM

03/01/78

ACCT NO.	ACCOUNT DESCRIPTION	FACTORY QUANTITY	FACTORY COSTS	SITE QUANTITY	SITE LABOR HRS	SITE LABOR COST	SITE MATERIAL COST	TOTAL COSTS
262.1672	ROCK EXCAVATION			188 CY	150 MH	1,607	752	
262.1673	BACKFILL			2283 CY	685 MH	7,335	2,283	
	262.167 EXCAVATION				1381 MH	14,789	5,220	20,009
	262.16 DE-ICING SYSTEM		129,087		3415 MH	41,576	7,796	178,459
	262.1 HEAT REJECTION SYSTEM		4,342,648		139448 MH	1,708,879	323,738	6,375,265
	262. MECHANICAL EQUIPMENT		4,342,648		13944E MH	1,708,879	323,738	6,375,265
	26 . MAIN COND HEAT REJECT SYS		4,346,048		46848C MH	5,406,359	2,187,048	11,939,455
	2 . TOTAL DIRECT COSTS		207,404,425		10807265 MH	132,611,085	67,069,328	407,085,238
9 .	TOTAL INDIRECT COSTS							
91 .	TOTAL INDIRECT COSTS	1 LT	95,850,000	1 LT	1870000 MH	19,453,000	32,500,000	
	*9 . TOTAL INDIRECT COSTS		95,850,000		1870000 MH	19,453,000	32,500,000	147,803,000
	TOTAL BASE COST		303,254,425		12677265 MH	152,064,485	99,569,328	554,888,238

*Detailed Cost Breakdown for Account Number 9., Indirect Costs for Mechanical Wet Towers, is in NUREG-0241 Report.

TABLE 2-2

COST ESTIMATE - 1200 MWe PRESSURIZED WATER REACTOR
NATURAL DRAFT COOLING SYSTEM

Account Number		Account Description	Cost Basis 7/76 ------FACTORY------ Quantity	Costs	----------SITE---------- Quantity	Labor Hrs.	Labor Cost	Material Cost	Total Costs
20 .		Land and Land Rights			500 AC			2,000,000	2,000,000
21 .		Structures and Improvements		5,902,426		4716266 MH	55,696,709	39,776,622	101,375,757
22 .		Reactor Plant Equipment		96,568,756		2145880 MH	27,768,659	9,142,990	133,480,445
23 .		Turbine Plant Equipment		82,629,701		1827006 MH	23,335,789	5,315,496	111,280,986
24 .		Electric Plant Equipment*		12,669,910		1367560 MH	16,783,828	8,033,947	37,487,685
25 .		Miscellaneous Plant Equipment		7,197,437		307827 MH	3,959,426	646,560	11,803,423
26 .		Main Condenser Heat Reject System							
261.		Structures		96,693		104736 MH	1,209,739	783,950	2,090,382
262.		Mechanical Equipment							
262.1		Heat Rejection System							
262.11		Water Intake Equipment							
262.111		Rotating Machinery		6,450		200 MH	2,643	264	
262.114		Purification & Filtration Equip.		142,625		4760 MH	59,440	6,685	
262.115		Piping - Screen Wash		2,730		436 MH	5,654	565	
262.116		Valves - Screen Wash		12,900					
262.117		Piping - Miscellaneous Items		405					
	262.11	Water Intake Equipment		165,110		5396 MH	67,737	7,514	240,361
262.12		Circulating Water System							
262.121		Rotating Machinery		2,728,000		13400 MH	177,106	17,710	
262.125		Pipe		921,774		38600 MH	499,235	49,924	
262.126		Valves		420,000		1500 MH	19,441	1,944	
262.127		Piping - Miscellaneous Items				20065 MH	213,474	96,192	

* Detailed cost breakdown for this account is found in Table 2-22

TABLE 2-2

COST ESTIMATE - 1200 Mle PRESSURIZED WATER REACTOR
NATURAL DRAFT COOLING SYSTEM

Account Number		Account Description	Cost Basis 7/76 ------FACTORY------ Quantity	Costs	----------SITE---------- Quantity	Labor Hrs.	Labor Cost	Material Cost	Total Costs
262.128		Instrumentation and Control		5,350		45 MH	548	27	
262.129		Skids/Foundations		60,200		1994 MH	25,860	3,142	
	262.12	Circulating Water System		4,135,324		75604 MH	935,664	168,939	5,239,927
262.13		Cooling Towers							
262.132		Heat Transfer Equipment		10,527,000		247000 MH	3,196,180	319,618	
262.138		Instrumentation and Control		36,000		350 MH	4,279	214	
	262.13	Cooling Towers		10,563,000		247350 MH	3,200,459	319,832	14,083,291
262.15		Main Ct. Make-up & Blowdown Sys.							
262.151		Make-up Water System		507,059		6077 MH	69,759	17,953	
262.152		Blowdown System		51,750		408 MH	5,216	512	
262.153		Make-up Water Pretreatment System		925,000		38278 MH	495,200	99,040	
	262.15	Main Ct. Make-up & Blowdn. Sys.		1,483,809		44763 MH	570,175	117,505	2,171,489
	262.	Mechanical Equipment		16,347,243		373113 MH	4,774,035	613,790	21,735,068
	26 .	Main Cond. Ht. Reject. Sys.		16,443,936		477849 MH	5,983,774	1,397,740	23,825,450
	2 .	Total Direct Costs		221,412,206		10842388 MH	133,528,185	66,313,355	421,253,746
	*9 .	Total Indirect Costs		95,974,000		1870000 MH	19,453,000	32,500,000	147,927,000
		Total Base Cost		317,386,206		12712388 MH	152,981,185	98,813,355	569,180,746

*Detailed Cost Breakdown for Account Number 9., Indirect Costs for Mechanical Wet Towers, is in NUREG-0241 Report.

TABLE 2-3

COST ESTIMATE - 1200 MWe PRESSURIZED WATER REACTOR
FAN-ASSISTED NATURAL DRAFT COOLING SYSTEM

Cost Basis
7/76

Account Number	Account Description	------FACTORY------ Quantity	Costs	----------SITE---------- Quantity	Labor Hrs.	Labor Cost	Material Cost	Total Costs
20 .	Land and Land Rights			500 AC			2,000,000	2,000,000
21 .	Structures and Improvements		5,902,426		4716266 MH	55,696,709	39,776,622	101,375,757
22 .	Reactor Plant Equipment		96,568,796		2145880 MH	27,768,659	9,142,990	133,480,445
23 .	Turbine Plant Equipment		82,629,701		1827006 MH	23,335,789	5,315,496	111,280,986
24 .	Electric Plant Equipment*		13,213,213		1460995 MH	17,928,865	8,597,479	39,739,557
25 .	Miscellaneous Plant Equipment		7,197,437		307827 MH	3,959,426	646,560	11,803,423
26 .	Main Condenser Heat Reject System							
261.	Structures		96,693		104736 MH	1,209,739	783,950	2,090,382
262.	Mechanical Equipment							
262.1	Heat Rejection System							
262.11	Water Intake Equipment							
262.111	Rotating Machinery		6,450		200 MH	2,643	264	
262.114	Purification & Filtration Equip.		142,625		4760 MH	59,440	6,685	
262.115	Piping - Screen Wash		2,730		436 MH	5,654	565	
262.116	Valves - Screen Wash		12,900					
262.117	Piping - Miscellaneous Items		405					
262.11	Water Intake Equipment		165,110		5396 MH	67,737	7,514	240,361
262.12	Circulating Water System							
262.121	Rotating Machinery		2,472,500		13000 MH	171,819	17,182	
262.125	Pipe		1,076,353		40370 MH	521,920	52,192	
262.126	Valves		420,000		1500 MH	19,441	1,944	
262.127	Piping - Miscellaneous Items				25755 MH	272,714	120,940	

* Detailed cost breakdown for this account is found in Table 2-21

TABLE 2-3

COST ESTIMATE - 1200 MWe PRESSURIZED WATER REACTOR
FAN-ASSISTED NATURAL DRAFT COOLING SYSTEM

Account Number		Account Description	Cost Basis 7/76 ------FACTORY------ Quantity	Costs	----------SITE---------- Quantity	Labor Hrs.	Labor Cost	Material Cost	Total Costs
262.128		Instrumentation and Control		5,350		45 MH	548	27	
262.129		Skids/Foundations		60,200		1994 MH	25,860	3,142	
	262.12	Circulating Water System		4,034,403		82664 MH	1,012,302	195,427	5,242,132
262.13		Cooling Towers							
262.132		Heat Transfer Equipment		9,823,500		168600 MH	2,181,684	218,168	
262.138		Instrumentation and Control		53,950		451 MH	5,514	276	
	262.13	Cooling Towers		9,877,450		169051 MH	2,187,198	218,444	12,283,092
262.15		Main Ct. Make-up & Blowdown Sys.							
262.151		Make-up Water System		507,059		6077 MH	69,759	17,953	
262.152		Blowdown System		51,750		408 MH	5,216	512	
262.153		Make-up Water Pretreatment System		925,000		38278 MH	495,200	99,040	
	262.15	Main Ct. Make-up & Blowdn. Sys.		1,483,809		44763 MH	570,175	117,505	2,171,489
	262.	Mechanical Equipment		15,560,772		301874 MH	3,837,412	538,890	19,937,074
	26 .	Main Cond. Ht. Reject. Sys.		15,657,465		406610 MH	5,047,151	1,322,840	22,027,456
	2 .	Total Direct Costs		221,169,038		1864584 MH	133,736,599	66,801,987	421,707,624
	9 .	Total Indirect Costs		96,001,000		1870000 MH	19,453,000	32,500,000	147,954,000
		Total Base Cost		317,170,038		12734584 MH	153,189,599	99,301,987	569,661,624

2.4 BOILING WATER REACTOR (BWR) COOLING SYSTEMS

Design and cost data for the BWR alternate cooling systems are presented in this subsection. The heat load of the unit is $8.05(10)^9$ Btu/hr at a turbine back pressure of 2.5 in HgA.

2.4.1 Once-Through Cooling System Design Description

Following are the BWR once-through system design descriptions for Account 26 and other accounts impacted by a change from mechanical draft cooling towers to once-through cooling. Design descriptions for accounts not impacted by this change are presented in Reference 2.

ACCOUNT 233 Condensing System

Condenser Equipment

The three surface condensers are single stage one-pass design. The condensers are designed to handle the total heat rejection from the main turbine and the two auxiliary turbine drives for the feedwater pumps. Each condenser has a condensing surface of 195,040 sq ft; 17,860 one and 1/8 inch diameter tubes, 37 ft long, and 20 BWG 90-10 CuNi tubes. Cooling water flow in each condenser is 352,600 resulting in a tube velocity of 7.25 ft/sec and a temperature rise at full load of 15 F. The balance of the condensing equipment is not affected by the once-through cooling system design, and equipment descriptions are presented in Reference 2.

ACCOUNT 261 Structures

Intake and Discharge Structures

The intake and discharge structures are identical to those designed for the PWR once-through cooling system.

Circulating Water Discharge Tunnel and Canal

The circulating water discharge tunnel and canal are identical to those designed for the PWR once-through cooling system.

ACCOUNT 262 Mechanical Equipment

Circulating Water Pumps

There are six 16.7 percent capacity circulating water pumps, of the mixed flow vertical type. Each pump is designed for a flow rate of 176,300 gpm with a total dynamic head of 27 ft. Circulating water pump motors are 1,500 hp each, operating at a synchronous speed of 320 rpm.

Circulating Water Intake System

Twelve traveling screens are provided to remove twigs, leaves and other debris from the river water that may otherwise enter the system and restrict the flow of water in the condenser tubes. The traveling screens are 14 ft wide by 48 ft long. They are sized to give a water velocity of 0.5 ft/sec at mean low water. Serving the traveling screens are two 100 percent capacity screen wash pumps with a flow rate of 3,600 gpm and a total dynamic head of 100 ft to wash the screens, when they require cleaning. Vertical trash racks with an automatic rake are provided ahead of the traveling screens.

Each screen well is provided with stop logs to allow dewatering (two screens and one pump) for maintenance purposes. To protect the traveling screens against ice during freezing water conditions, two vertical de-icing motor driven pumps, each designed for a flowrate of 32,000 gpm at 35 ft

head, are used to pump warm water from the condenser discharge to the screens.

2.4.2 Natural Draft Towers

ACCOUNT 26 MAIN CONDENSER HEAT REJECTION SYSTEM

ACCOUNT 261 Structures

All of the structures required for the natural draft tower are of identical design to those designed for the mechanical draft towers. Design descriptions for the makeup water intake and discharge structures, circulating water pumphouse and makeup water pretreatment building are presented in the mechanical draft wet tower system description.

ACCOUNT 262 Mechanical Equipment

Circulating Water Pumps

There are four 25 percent capacity circulating water pumps of the mixed flow vertical type. Each pump is designed for a flowrate of 153,125 gpm with a total dynamic head of 121 ft. Circulating water pump motors are 6,000 hp each, operating at a synchronous speed of 320 rpm.

Cooling Towers

There is one natural draft wet cooling tower designed to cool the entire circulating water flow of 610,500 gpm from 118 F to 92 F when operating at wet bulb and dry bulb temperatures of 74 F and 93 F respectively. To provide the draft required for airflow, the tower employs a reinforced concrete hyperbolic shell 576 ft high. At the base the diameter is 441 ft. Other design characteristics of the natural draft tower are as described in the PWR's natural draft cooling system in subsection 2.3.2.

Main Cooling Tower Makeup and Blowdown Systems

The makeup water requirements are the same at the design condition for the natural draft tower as the mechanical draft towers. This allows the use of identical makeup and blowdown facilities, as designed for the mechanical draft tower.

2.4.3 Fan-Assisted Natural Draft Towers

ACCOUNT 26 MAIN CONDENSER HEAT REJECTION SYSTEM

ACCOUNT 261 Structures

All of the structures required for the fan-assisted natural draft towers are of identical design to those designed for the mechanical draft towers. Design descriptions for the makeup water intake and discharge structures, circulating water pumphouse and makeup water pretreatment building are presented in the mechanical draft tower system description.

ACCOUNT 262 Mechanical Equipment

Ciruclating Water Pumps

There are four 25 percent capacity circulating water pumps of the mixed flow vertical type. Each pump is designed for a flow rate of 153,125 gpm with a total dynamic head of 105 ft. Circulating water pump motors are 5,000 hp each, operating at a synchronous speed of 320 rpm.

Cooling Towers

There are two fan-assisted natural draft wet cooling towers each sized for one half of the requirements. Each tower is designed to cool 305,250

gpm of water from 118 F to 92 F when operating at a wet bulb of 74 F. Each tower has a base diameter of 257 ft and an overall height of 205 ft. Twenty-four 28 ft diameter fans are positioned about the periphery of each tower's base. Other design characteristics of the fan-assisted natural draft tower are as described in Subsection 2.3.3 that discusses the PWR's fan-assisted natural draft cooling system.

Main Cooling Tower Makeup and Blowdown Systems

The makeup water requirements are the same at the design condition for the fan-assisted natural draft tower as the mechanical draft towers. This allows the use of identical makeup and blowdown facilities, as designed for the mechanical draft tower.

TABLE 2-4

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COST ESTIMATE - 1200 MWe BOILING WATER REACTOR
ONCE-THROUGH COOLING SYSTEM

03/01/78

ACCT NO.	ACCOUNT DESCRIPTION	FACTORY QUANTITY	FACTORY COSTS	SITE QUANTITY	SITE LABOR HRS	SITE LABOR COST	SITE MATERIAL COST	TOTAL COSTS
2 .	TOTAL DIRECT COSTS							
20 .	LAND AND LAND RIGHTS			1 LT			2,000,000	
21 .	STRUCTURES + IMPROVEMENTS	1 LT	4,270,050	1 LT	5316054 MH	62,978,180	46,075,500	
22 .	REACTOR PLANT EQUIPMENT	1 LT	90,832,140	1 LT	2025520 MH	26,178,940	8,723,080	
23 .	TURBINE PLANT EQUIPMENT*	1 LT	85,472,190	1 LT	1859394 MH	23,751,730	5,385,560	
24 .	ELECTRIC PLANT EQUIPMENT*	1 LT	13,394,250	1 LT	1378121 MH	16,919,790	8,246,690	
25 .	MISCELLANEOUS PLANT EQUIPT	1 LT	6,821,276	1 LT	283036 MH	3,638,273	615,419	
26 .	MAIN COND HEAT REJECT SYS							
261.	STRUCTURES							
261.1	MAKEUP WTR INT + DISCH STR							
261.11	INTAKE STRUCTURE							
261.111	EXCAVATION WORK							
261.1111	EARTH EXCAVATION			3550 CY	888 MH	10,381	3,550	
261.1112	ROCK EXCAVATION			14710 CY	11768 MH	137,567	58,840	
261.1113	SHEETING (TEMP COFFERDAM)			140 TN	2800 MH	38,416	23,800	
261.1114	STRCT STL (TEMP COFFERDAM)							
261.1115	PUMPING			1 LT	8000 MH	74,560	75,000	
	261.111 EXCAVATION WORK				23456 MH	260,924	161,190	422,114
261.112	BEARING PILES (STEEL)							
261.113	SUBSTRUCTURE CONCRETE							
261.1131	FORMWORK			87000 SF	69600 MH	768,551	87,000	

* Detailed cost breakdown for these accounts are found in Tables 2-23 and 2-24

TABLE 2-4

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PLANT CODE 292 | COST BASIS 07/78

COST ESTIMATE - 1200 MWe BOILING WATER REACTOR
ONCE-THROUGH COOLING SYSTEM

03/01/78

ACCT NO.	ACCOUNT DESCRIPTION	FACTORY QUANTITY	FACTORY COSTS	SITE QUANTITY	SITE LABOR HRS	SITE LABOR COST	SITE MATERIAL COST	TOTAL COSTS
261.1132	REINFORCING STEEL			368 TN	12880 MH	166,322	147,200	
261.1133	CONCRETE			4900 CY	8575 MH	87,567	171,500	
261.1134	EMBEDDED STEEL			24 TN	3600 MH	43,297	36,000	
261.1135	CONCRETE FINISH			49000 SF	980 MH	10,008	490	
261.1136	WATERPROOFING							
261.1137	CONSTRUCTION JOINTS			1107 SF	1107 MH	12,223	1,107	
261.1138	RUBBING CONCRETE SURFACES							
	261.113 SUBSTRUCTURE CONCRETE				96742 MH	1,087,968	443,297	1,531,265
261.114	SUPERSTRUCTURE							
261.1141	CONCRETE WORK							
261.1142	STRUCTURAL + MISC. STEEL							
261.11421	STRUCTURAL STEEL							
261.11422	GRATING (GALV)			1115 SF	222 MH	2,892	3,345	
261.11423	HANDRAIL			250 LF	188 MH	2,446	2,500	
	261.1142 STRUCTURAL + MISC. STEEL				410 MH	5,338	5,845	11,183
261.1143	EXTERIOR WALLS							
261.11431	CONCRETE							
261.11432	MASONRY			1375 SF	344 MH	3,925	3,850	
	261.1143 EXTERIOR WALLS				344 MH	3,925	3,850	7,775
261.1144	ROOF DECK							
261.11441	METAL ROOF DECK			750 SF	60 MH	782	750	

TABLE 2-4

PLANT CODE 292 | COST BASIS 07/76

COST ESTIMATE - 1200 MWe BOILING WATER REACTOR
ONCE-THROUGH COOLING SYSTEM

03/01/78

ACCT NO.	ACCOUNT DESCRIPTION	FACTORY QUANTITY	FACTORY COSTS	SITE QUANTITY	SITE LABOR HRS	SITE LABOR COST	SITE MATERIAL COST	TOTAL COSTS
	261.1144 ROOF DECK				60 MH	782	750	1,532
261.1145	ROOFING + FLASHING							
261.11451	B.U. ROOFG, INSULTN, + FLA			750 SF	53 MH	714	938	
	261.1145 ROOFING + FLASHING				53 MH	714	938	1,652
261.1146	INTERIOR WALLS							
261.11461	CONCRETE WALLS							
261.11462	MASONRY WALLS			250 SF	60 MH	685	700	
261.11463	PARTITIONS							
	261.1146 INTERIOR WALLS				60 MH	685	700	1,385
261.1147	DOORS + WINDOWS							
261.11471	ROLLING STEEL DOORS			100 SF	60 MH	782	1,400	
261.11472	PERSONNEL DOORS			96 SF	77 MH	893	1,152	
261.11473	SASH + GLAZING							
	261.1147 DOORS + WINDOWS				137 MH	1,675	2,552	4,227
261.1149	PAINTING							
261.11491	CONCRETE							
261.11492	STEELWORK			24 TN	120 MH	1,148	144	
261.11493	METAL DECK			750 SF	15 MH	144	150	
261.11494	HANDRAIL			250 LF	50 MH	479	25	
	261.1149 PAINTING				185 MH	1,771	319	2,090

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COST ESTIMATE - 1200 MWe BOILING WATER REACTOR
ONCE-THROUGH COOLING SYSTEM

03/01/78

ACCT NO.	ACCOUNT DESCRIPTION	FACTORY QUANTITY	FACTORY COSTS	SITE QUANTITY	SITE LABOR HRS	SITE LABOR COST	SITE MATERIAL COST	TOTAL COSTS
	261.114 SUPERSTRUCTURE				1249 MH	14,890	14,954	29,844
261.117	BULKHEAD							
261.1171	STEEL SHEETING			70 TN	700 MH	9,604	24,500	
261.1172	STRUCTURAL STEEL			4 TN	80 MH	1,040	3,000	
261.1173	GRAVEL FILL							
261.1174	DREDGING			20885 CY	4177 MH	52,129	41,770	
261.1175	RIP-RAP (12 IN. THICK)			240 CY	360 MH	3,583	2,400	
261.1176	CHAIN LINK FENCE(7FT HIGH)			440 LF	132 MH	1,230	2,860	
	261.117 BULKHEAD				5445 MH	67,586	74,530	142,116
261.118	PROTECTIVE DOLPHINS							
261.1181	WOOD PILES			2750 LF	550 MH	7,546	11,000	
	261.118 PROTECTIVE DOLPHINS				550 MH	7,546	11,000	18,546
261.119	BUILDING SERVICES							
261.1191	PLUMBING + DRAINS			5 EA	625 MH	8,099	5,000	
261.1192	HEATING + VENTILATING	1 LT	3,400	1 LT	193 MH	2,494	249	
261.1193	LIGHTING + SERVICE POWER			750 SF	226 MH	2,779	1,350	
	261.119 BUILDING SERVICES		3,400		1044 MH	13,372	6,599	23,371
	261.11 INTAKE STRUCTURE		3,400		128490 MH	1,452,286	711,570	2,167,256
	261.1 MAKEUP WTR INT + DISCH STR		3,400		128490 MH	1,452,286	711,570	2,167,256
261.4	CHLORINATION BUILDING							

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COST ESTIMATE - 1200 MWe BOILING WATER REACTOR
ONCE-THROUGH COOLING SYSTEM

03/01/78

ACCT NO.	ACCOUNT DESCRIPTION	FACTORY QUANTITY	FACTORY COSTS	SITE QUANTITY	SITE LABOR HRS	SITE LABOR COST	SITE MATERIAL COST	TOTAL COSTS
261.41	BUILDING STRUCTURE							
261.411	EXCAVATION WORK							
261.4111	EARTH EXCAVATION			53 CY	13 MH	140	53	
261.4114	BACKFILL			41 CY	12 MH	118	41	
	261.411 EXCAVATION WORK				25 MH	258	94	352
261.413	SUBSTRUCTURE CONCRETE							
261.4131	FORMWORK			216 SF	173 MH	1,910	216	
261.4132	REINF.STEEL			2 TN	71 MH	917	800	
261.4133	CONCRETE			12 CY	21 MH	213	420	
261.4134	EMBEDDED STEEL							
261.4135	FLOOR FINISH			105 SF	1 MH	9	1	
261.4136	WATERPROOFING							
261.4137	CONSTRUCTION JOINTS			50 SF	50 MH	552	50	
261.4138	RUBBING CONCRETE SURFACES							
261.4139	WIRE FABRIC			105 SF	2 MH	27	13	
	261.413 SUBSTRUCTURE CONCRETE				318 MH	3,628	1,500	5,128
261. ..	SUPERSTRUCTURE							
261.4141	CONCRETE WORK							
261.4142	STRUCT. + MISC. STEEL							
261.41421	STRUCT. STEEL							
261.41423	MISC. FRAMES, ETC.			2 TN	120 MH	1,564	2,400	

TABLE 2-4

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COST ESTIMATE - 1200 MWe BOILING WATER REACTOR
ONCE-THROUGH COOLING SYSTEM

03/01/78

ACCT NO.	ACCOUNT DESCRIPTION	FACTORY QUANTITY	FACTORY COSTS	SITE QUANTITY	SITE LABOR HRS	SITE LABOR COST	SITE MATERIAL COST	TOTAL COSTS
	261.4142 STRUCT. + MISC. STEEL				120 MH	1,564	2,400	3,964
261.4143	EXTERIOR WALLS							
261.41432	MASONRY			310 SF	78 MH	890	868	
	261.4143 EXTERIOR WALLS				78 MH	890	868	1,758
261.4144	ROOF DECK							
261.41441	METAL ROOF DECK			170 SF	13 MH	171	170	
	261.4144 ROOF DECK				13 MH	171	170	341
261.4145	ROOFING + FLASHING							
261.41451	B.U.R.ROOFING,FLASHING+INSUL			170 SF	12 MH	162	213	
	261.4145 ROOFING + FLASHING				12 MH	162	213	375
261.4147	DOORS + WINDOWS							
261.41472	PERSONNEL DOORS			50 SF	40 MH	464	600	
261.41473	SASH + GLAZING			25 SF	13 MH	151	300	
	261.4147 DOORS + WINDOWS				53 MH	615	900	1,515
261.4149	PAINTING							
261.41492	STEELWORK			2 TN	10 MH	96	12	
261.41493	METAL DECK			170 SF	3 MH	29	17	
	261.4149 PAINTING				13 MH	125	29	154
	261.414 SUPERSTRUCTURE				289 MH	3,527	4,580	8,107

TABLE 2-4

PLANT CODE 292 | COST BASIS 07/76

COST ESTIMATE - 1200 MWe BOILING WATER REACTOR
ONCE-THROUGH COOLING SYSTEM

03/01/78

ACCT NO.	ACCOUNT DESCRIPTION	FACTORY QUANTITY	FACTORY COSTS	SITE QUANTITY	SITE LABOR HRS	SITE LABOR COST	SITE MATERIAL COST	TOTAL COSTS
	261.41 BUILDING STRUCTURE				632 MH	7,413	6,174	13,587
261.424	LIGHTING + SERVICE POWER							
	261.4 CHLORINATION BUILDING				632 MH	7,413	6,174	13,587
261.5	DISCHARGE TUNNEL + CANAL							
261.51	EXCAVATION							
261.511	EARTH EXCAVATION			26300 CY	6575 MH	70,421	26,300	
261.512	ROCK EXCAVATION			38300 CY	30640 MH	328,168	153,200	
261.514	BACKFILL			13050 CY	3915 MH	41,932	13,050	
261.515	DEWATERING							
	261.51 EXCAVATION				41130 MH	440,521	192,550	633,071
261.53	SUBSTRUCTURE CONCRETE							
261.531	FORMWORK			120580 SF	96465 MH	1,065,205	120,580	
261.532	REINFORCING STEEL			953 TN	33355 MH	430,723	381,200	
261.533	CONCRETE			12700 CY	22225 MH	226,962	444,500	
261.534	EMBEDDED STEEL							
261.535	FLOOR FINISH							
261.536	WATERPROOFING							
261.537	CONSTRUCTION JOINTS			6736 SF	6735 MH	74,370	6,736	
261.538	RUBBING CONCRETE SURFACES							
	261.53 SUBSTRUCTURE CONCRETE				158780 MH	1,797,260	953,016	2,750,276
	261.5 DISCHARGE TUNNEL + CANAL				199910 MH	2,237,781	1,145,566	3,383,347

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COST ESTIMATE - 1200 MWe BOILING WATER REACTOR
ONCE-THROUGH COOLING SYSTEM

03/01/78

ACCT NO.	ACCOUNT DESCRIPTION	FACTORY QUANTITY	FACTORY COSTS	SITE QUANTITY	SITE LABOR HRS	SITE LABOR COST	SITE MATERIAL COST	TOTAL COSTS
	261. STRUCTURES		3,400		329032 MH	3,697,480	1,863,310	5,564,190
262.	MECHANICAL EQUIPMENT							
262.1	HEAT REJECTION SYSTEM							
262.11	WATER INTAKE EQUIPMENT							
262.111	ROTATING MACHINERY							
262.1111	SCREEN WASH PUMP+MOTOR	2 EA	34,400	1 LT	700 MH	9,252	925	
262.11111	SCREEN WASH PUMP							
262.11112	SCREEN WASH PUMP MOTOR							
	262.1111 SCREEN WASH PUMP+MOTOR		34,400		700 MH	9,252	925	44,577
	262.111 ROTATING MACHINERY		34,400		700 MH	9,252	925	44,577
262.114	PURIFICATION+FILTRATION EQ							
262.1141	TRAVELING SCREENS							
262.11411	CIRCULATING WATER PUMPS	12 EA	740,400	1 LT	20400 MH	263,913	26,391	
262.11412	SCREEN WASH PUMPS	2 EA	64,000	1 LT	600 MH	7,761	776	
	262.1141 TRAVELING SCREENS		804,400		21000 MH	271,674	27,167	1,103,241
262.1142	TRASH RACK	13 EA	148,200	1 LT	4355 MH	56,692	5,669	
262.1143	TRASH RAKE	1 LT	42,000	1 LT	800 MH	10,350	1,035	
262.1144	STOP LOGS							
262.11441	CIRCULATING WATER PUMPS			324 EA	4860 MH	45,295	10,530	

PLANT CODE 292 | COST BASIS 07/76

COST ESTIMATE - 1200 MWe BOILING WATER REACTOR
ONCE-THROUGH COOLING SYSTEM

03/01/78

ACCT NO.	ACCOUNT DESCRIPTION	FACTORY QUANTITY	FACTORY COSTS	SITE QUANTITY	SITE LABOR HRS	SITE LABOR COST	SITE MATERIAL COST	TOTAL COSTS
262.11442	SCREEN WASH PUMPS			54 EA	540 MH	5,033	972	
	262.1144 STOP LOGS				5400 MH	50,328	11,502	61,830
	262.114 PURIFICATION-FILTRATION EQ		994,600		31555 MH	389,044	45,373	1,429,017
262.115	PIPING-SCREEN WASH							
262.1151	2 IN. + SMALLER							
262.1152	2.5 IN. + LARGER							
262.11521	CS/NNS	29060 LB	43,590	1 LT	6975 MH	90,400	9,040	
	262.1152 2.5 IN. + LARGER		43,590		6975 MH	90,400	9,040	143,030
	262.115 PIPING-SCREEN WASH		43,590		6975 MH	90,400	9,040	143,030
262.116	VALVES-SCREEN WASH	1 LT	27,600					
262.1162	CHECK							
262.1166	BUTTERFLY							
	262.116 VALVES-SCREEN WASH		27,600					27,600
262.117	PIPING-MISC ITEMS							
262.1171	HANGERS + SUPPORTS	4360 LB	6,540					
262.1172	INSULATION							
262.1173	SPECIALTIES							
	262.117 PIPING-MISC ITEMS		6,540					6,540
	262.11 WATER INTAKE EQUIPMENT		1,106,730		39230 MH	488,696	55,338	1,650,764

TABLE 2-4

PLANT CODE 292 | COST BASIS 07/76 | COST ESTIMATE - 1200 MWe BOILING WATER REACTOR ONCE-THROUGH COOLING SYSTEM | | 03/01/78

ACCT NO.	ACCOUNT DESCRIPTION	FACTORY QUANTITY	FACTORY COSTS	SITE QUANTITY	SITE LABOR HRS	SITE LABOR COST	SITE MATERIAL COST	TOTAL COSTS
262.12	CIRCULATING WATER SYSTEM							
262.121	ROTATING MACHINERY							
262.1211	CIRCULATING WATER PUMP+MTR	6 EA	1,650,000	1 LT	19920 MH	263,342	26,334	
262.12111	CIRC WATER PUMP							
262.12112	CIRC WATER PUMP MOTOR							
	262.1211 CIRCULATING WATER PUMP+MTR		1,650,000		19920 MH	263,342	26,334	1,939,676
	262.121 ROTATING MACHINERY		1,650,000		19920 MH	263,342	26,334	1,939,676
262.125	PIPE							
262.1251	2 IN + SMALLER							
262.1252	2.5 IN + LARGER							
262.12521	CONCRETE/NNS	2487 LF	711,158	1 LT	9500 MH	121,752	12,175	
262.12522	CS/NNS	122040 LB	183,060	1 LT	29290 MH	379,608	37,961	
	262.1252 2.5 IN + LARGER		894,218		38790 MH	501,360	50,136	1,445,714
	262.125 PIPE		894,218		38790 MH	501,360	50,136	1,445,714
262.126	VALVES							
262.1266	BUTTERFLY	18 EA	416,358	1 LT	1979 MH	25,652	2,565	
	262.126 VALVES		416,358		1979 MH	25,652	2,565	444,575
262.127	PIPING / MISC. ITEMS							
262.1271	HANGERS + SUPPORTS							

TABLE 2-4

COST ESTIMATE - 1200 MWe BOILING WATER REACTOR
ONCE-THROUGH COOLING SYSTEM

PLANT CODE 292 | COST BASIS 07/76 | 03/01/78

ACCT NO.	ACCOUNT DESCRIPTION	FACTORY QUANTITY	FACTORY COSTS	SITE QUANTITY	SITE LABOR HRS	SITE LABOR COST	SITE MATERIAL COST	TOTAL COSTS
262.1272	INSULATION							
262.1273	SPECIALTIES							
262.12731	EXPANSION JOINTS	1 LT	92,990	1 LT	82 MH	1,066	107	
	262.1273 SPECIALTIES		92,990		82 MH	1,066	107	94,053
262.1274	PIPE TRENCHING							
262.12741	EXCAVATION							
262.127411	EARTH EXCAVATION			16420 CY	4105 MH	43,966	16,420	
262.127412	ROCK EXCAVATION			1744C CY	10752 MH	115,159	53,760	
	262.12741 EXCAVATION				14857 MH	159,125	70,180	229,305
262.12742	BACKFILL			1489L CY	4467 MH	44,455	14,890	
262.12743	COMPACTED SAND BED			651C CY	6510 MH	64,789	39,060	
262.12744	SUBSTRUCTURE CONCRETE							
262.127441	FORMWORK			6080 SF	4865 MH	53,722	6,080	
262.127442	REINF STEEL			56 TN	1960 MH	25,311	22,400	
262.127443	CONCRETE			750 CY	1313 MH	13,410	26,250	
	262.12744 SUBSTRUCTURE CONCRETE				8138 MH	92,443	54,730	147,173
	262.1274 PIPE TRENCHING				33972 MH	360,811	178,860	539,671
	262.127 PIPING / MISC. ITEMS		92,990		34054 MH	361,877	178,967	633,724
262.128	INSTRUMENTATION + CONTROL	1 LT	8,025	1 LT	6C MH	733	37	
262.129	SKIDS / FOUNDATIONS							

TABLE 2-4

PLANT CODE 292 COST BASIS 07/75

COST ESTIMATE - 1200 MWe BOILING WATER REACTOR
ONCE-THROUGH COOLING SYSTEM

03/01/77R

ACCT NO.	ACCOUNT DESCRIPTION	FACTORY QUANTITY	FACTORY COSTS	SITE QUANTITY	SITE LABOR HRS	SITE LABOR COST	SITE MATERIAL COST	TOTAL COSTS
262.1291	CHLORINATION SYSTEM	1 LT	105,350	1 LT	2600 MH	33,636	3,364	
262.129	SKIDS / FOUNDATIONS		105,350		2600 MH	33,636	3,364	142,350
262.12	CIRCULATING WATER SYSTEM		3,166,831		47403 MH	1,186,600	261,403	4,614,834
262.16	DE-ICING SYSTEM							
262.161	ROTATING MACHINERY							
262.1611	DE-ICING PUMPS + MOTORS	2 EA	103,700	1 LT	1832 MH	24,219	2,421	
262.16111	DE-ICING PUMPS							
262.16112	DE-ICING PUMP MOTORS							
262.1611	DE-ICING PUMPS + MOTORS		103,700		1832 MH	24,219	2,421	130,340
262.161	ROTATING MACHINERY		103,700		1832 MH	24,219	2,421	130,340
262.165	PIPING							
262.1651	2 IN. + SMALLER							
262.1652	2.5 IN. + LARGER							
262.16521	CONCRETE	490 LF	11,647	1 LT	196 MH	2,511	251	
262.1652	2.5 IN. + LARGER		11,647		196 MH	2,511	251	14,409
262.165	PIPING		11,647		196 MH	2,511	251	14,409
262.166	VALVES	2 EA	17,640		79 MH	1,028		
262.167	EXCAVATION							
262.1671	EARTH EXCAVATION			2185 CY	546 MH	5,847	2,185	

TABLE 2-4

PLANT CODE 292 | COST BASIS 07/78

COST ESTIMATE - 1200 MWe BOILING WATER REACTOR
ONCE-THROUGH COOLING SYSTEM

03/01/78

ACCT NO.	ACCOUNT DESCRIPTION	FACTORY QUANTITY	FACTORY COSTS	SITE QUANTITY	SITE LABOR HRS	SITE LABOR COST	SITE MATERIAL COST	TOTAL COSTS
262.1672	ROCK EXCAVATION			188 CY	150 MH	1,607	752	
262.1673	BACKFILL			2283 CY	645 MH	7,335	2,283	
262.167	EXCAVATION				1381 MH	14,789	5,220	20,009
262.16	DE-ICING SYSTEM		132,987		3442 MH	42,547	7,892	183,426
262.1	HEAT REJECTION SYSTEM		4,406,548		140121 MH	1,717,843	324,633	6,449,024
262.	MECHANICAL EQUIPMENT		4,406,548		140121 MH	1,717,843	324,633	6,449,024
26 .	MAIN COND HEAT REJECT SYS		4,409,948		469153 MH	5,415,323	2,187,943	12,013,214
2 .	TOTAL DIRECT COSTS		205,199,854		11331272 MH	138,882,236	73,234,192	417,316,282
9 .	TOTAL INDIRECT COSTS							
91 .	TOTAL INDIRECT COSTS	1 LT	97,905,000	1 LT	1881533 MH	19,590,000	33,634,000	
*9 .	TOTAL INDIRECT COSTS		97,905,000		1881533 MH	19,590,000	33,634,000	151,129,000
	TOTAL BASE COST		303,104,854		13212811 MH	158,472,236	106,868,192	568,445,282

*Detailed Cost Breakdown for Account Number 9., Indirect Costs for Mechanical Wet Towers, is in NUREG-0241 Report.

TABLE 2-5

COST ESTIMATE - 1200 MWe BOILING WATER REACTOR
NATURAL DRAFT COOLING SYSTEM

Account Number		Account Description	Cost Basis 7/76 ------FACTORY------ Quantity	Costs	----------SITE---------- Quantity	Labor Hrs.	Labor Cost	Material Cost	Total Costs
20 .		Land and Land Rights			500 AC			2,000,000	2,000,000
21 .		Structures and Improvements		4,270,053		5316054 MH	62,978,177	46,075,502	113,323,732
22 .		Reactor Plant Equipment		90,832,138		2025520 MH	26,178,935	8,723,084	125,734,157
23 .		Turbine Plant Equipment		87,185,379		1883231 MH	24,070,476	5,417,434	116,673,289
24 .		Electric Plant Equipment *		13,603,714		1380899 MH	16,952,108	8,249,333	38,805,155
25 .		Miscellaneous Plant Equipment		6,821,276		283036 MH	3,638,273	615,419	11,074,968
26 .		Main Condenser Heat Reject System							
261.		Structures		96,693		104736 MH	1,209,739	785,750	2,092,182
262.		Mechanical Equipment							
262.1		Heat Rejection System							
262.11		Water Intake Equipment							
262.111		Rotating Machinery		6,450		200 MH	2,643	264	
262.114		Purification & Filtration Equip.		142,625		4760 MH	59,440	6,685	
262.115		Piping - Screen Wash		2,730		436 MH	5,654	565	
262.116		Valves - Screen Wash		12,900					
262.117		Piping - Miscellaneous Items		405					
	262.11	Water Intake Equipment		165,110		5396 MH	67,737	7,514	240,361
262.12		Circulating Water System							
262.121		Rotating Machinery		2,800,000		13400 MH	177,106	17,710	
262.125		Pipe		945,895		38958 MH	503,825	50,383	
262.126		Valves		420,000		1500 MH	19,441	1,944	
262.127		Piping - Miscellaneous Items				20065 MH	213,474	96,192	

* Detailed cost breakdown for this account is found in Table 2-26

TABLE 2-5

COST ESTIMATE - 1200 MWe BOILING WATER REACTOR
NATURAL DRAFT COOLING SYSTEM

Account Number		Account Description	Cost Basis 7/76 ------FACTORY------ Quantity	Costs	----------SITE---------- Quantity	Labor Hrs.	Labor Cost	Material Cost	Total Costs
262.128		Instrumentation and Control		5,350		45 MH	548	27	
262.129		Skids/Foundations		60,200		1994 MH	25,860	3,142	
	262.12	Circulating Water System		4,231,445		75962 MH	940,254	169,398	5,341,097
262.13		Cooling Towers							
262.132		Heat Transfer Equipment		10,660,400		249500 MH	3,228,530	322,853	
262.138		Instrumentation and Control		36,000		350 MH	4,279	214	
	262.13	Cooling Towers		10,696,400		249850 MH	3,232,809	323,067	14,252,276
262.15		Main Ct. Make-up & Blowdown Sys.							
262.151		Make-up Water System		507,059		6077 MH	69,759	17,953	
262.152		Blowdown System		51,750		408 MH	5,216	512	
262.153		Make-up Water Pretreatment System		925,000		38278 MH	495,200	99,040	
	262.15	Main Ct. Make-up & Blowdn. Sys.		1,483,809		44763 MH	570,175	117,505	2,171,489
	262.	Mechanical Equipment		16,576,764		375971 MH	4,810,975	617,484	22,005,223
	26 .	Main Cond. Ht. Reject. Sys.		16,673,457		480707 MH	6,020,714	1,403,234	24,097,405
	2 .	Total Direct Costs		219,386,017		11369467 MH	139,838,683	72,484,006	431,708,706
	*9 .	Total Indirect Costs		98,034,000		1881533 MH	19,590,000	33,634,000	151,258,000
		Total Base Cost		317,420,017		13251000 MH	159,428,683	106,118,006	582,966,706

*Detailed Cost Breakdown for Account Number 9., Indirect Costs for Mechanical Wet Towers, is in NUREG-0241 Report.

TABLE 2-6

COST ESTIMATE - 1200 MWe BOILING WATER REACTOR
FAN-ASSISTED NATURAL DRAFT COOLING SYSTEM

Account Number	Account Description	Cost Basis 7/76 ------FACTORY------ Quantity	Costs	----------SITE---------- Quantity	Labor Hrs.	Labor Cost	Material Cost	Total Costs
20 .	Land and Land Rights			500 AC			2,000,000	2,000,000
21 .	Structures and Improvements		4,270,053		5316054 MH	62,978,177	46,075,502	113,323,732
22 .	Reactor Plant Equipment		90,832,138		2025520 MH	26,178,935	8,723,084	125,734,157
23 .	Turbine Plant Equipment		87,185,379		1883251 MH	24,070,476	5,417,434	116,673,289
24 .	Electric Plant Equipment*		14,147,017		1474334 MH	18,047,145	8,812,865	41,057,027
25 .	Miscellaneous Plant Equipment		6,821,276		283036 MH	3,638,273	615,419	11,074,968
26 .	Main Condenser Heat Reject System							
261.	Structures		96,693		104736 MH	1,209,739	785,750	2,092,182
262.	Mechanical Equipment							
262.1	Heat Rejection System							
262.11	Water Intake Equipment							
262.111	Rotating Machinery		6,450		200 MH	2,643	264	
262.114	Purification & Filtration Equip.		142,625		4760 MH	59,440	6,685	
262.115	Piping - Screen Wash		2,730		436 MH	5,654	565	
262.116	Valves - Screen Wash		12,900					
262.117	Piping - Miscellaneous Items		405					
262.11	Water Intake Equipment		165,110		5396 MH	67,737	7,514	240,361
262.12	Circulating Water System							
262.121	Rotating Machinery		2,538,132		13000 MH	171,819	17,182	
262.125	Pipe		1,100,476		40733 MH	526,574	52,658	
262.126	Valves		420,000		1500 MH	19,441	1,944	
262.127	Piping - Miscellaneous Items				25755 MH	272,714	120,940	

* Detailed cost breakdown for this account is found in Table 2-25

TABLE 2-6

COST ESTIMATE - 1200 MWe BOILING WATER REACTOR
FAN-ASSISTED NATURAL DRAFT COOLING SYSTEM

Account Number	Account Description	Cost Basis 7/76	FACTORY		SITE				
			Quantity	Costs	Quantity	Labor Hrs.	Labor Cost	Material Cost	Total Costs
262.128	Instrumentation and Control			5,350		45 MH	548	27	
262.129	Skids/Foundations			60,200		1994 MH	25,860	3,142	
262.12	Circulating Water System			4,124,158		83027 MH	1,016,956	195,893	5,337,007
262.13	Cooling Towers								
262.132	Heat Transfer Equipment			9,826,500		168600 MH	2,181,684	218,168	
262.138	Instrumentation and Control			53,950		451 MH	5,514	276	
262.13	Cooling Towers			9,880,450		169051 MH	2,187,198	218,444	12,286,092
262.15	Main Ct. Make-up & Blowdown Sys.								
262.151	Make-up Water System			507,059		6077 MH	69,759	17,953	
262.152	Blowdown System			51,750		408 MH	5,216	512	
262.153	Make-up Water Pretreatment System			925,000		38278 MH	495,200	99,040	
262.15	Main Ct. Make-up & Blowdn. Sys.			1,483,809		44763 MH	570,175	117,505	2,171,489
262.	Mechanical Equipment			15,653,527		302237 MH	3,842,066	539,356	20,034,949
26 .	Main Cond. Ht. Reject. Sys.			15,750,220		406973 MH	5,051,805	1,325,106	22,127,131
2 .	Total Direct Costs			219,006,083		11389168 MH	140,014,811	72,969,410	431,990,304
*9 .	Total Indirect Costs			98,058,000		1881533 MH	19,590,000	33,634,000	151,282,000
	Total Base Cost			317,064,083		13270701 MH	159,604,811	106,603,410	583,272,304

*Detailed Cost Breakdown for Account Number 9., Indirect Costs for Mechanical Wet Towers, is in NUREG-0241 Report.

2.5 1200 MWe HIGH SULFUR COAL-FIRED PLANT COOLING SYSTEMS

Design and cost data for the 1200 MWe high sulfur coal-fired plant alternate cooling systems are presented in this subsection.

2.5.1 Once-Through Cooling System Design Description

Following are the once-through design descriptions for Account 26 and other accounts impacted by a change from mechanical draft cooling towers to once-through cooling. Design descriptions for accounts not impacted by this change are presented in Reference 3.

ACCOUNT 233 Condensing System

Condenser Equipmert

The two surface condenser are single stage one-pass design. The condensers are designed to handle the total heat rejection from the main turbine. Each condenser has a condensing surface of 208,200 sq ft; 19,110 one and 1/8 inch diameter tubes, 37 ft long, and 20 BWG 90-10 CuNi. Cooling water flow in each condenser is 377,500 gpm resulting in a tube velocity of 7.25 ft/sec and a temperature rise at full load of 15 F.

The balance of the condensing equipment are not affected by the once-through cooling system design and equipment descriptions are presented in Reference 3.

ACCOUNT 261 Structures

Intake and discharge structures are located along the river bank west of the main plant structures. The intake basin is 170 ft long, 46 ft wide and 50 ft deep and is entirely below plant grade. The volume of the basin is approximately 391,000 cu ft. Attached to the north end of the structure

is a service water pump basin founded 30 ft below grade. The structure is reinforced concrete with foundation mat bearing on rock. There are six circulating water pumps supported from the reinforced concrete basin roof slab. The intakes are protected by bar racks, trash rakes, stop logs, traveling screens and a trash pit. Fish escapes are also provided. A channel is excavated in the river bottom from the ship channel to the intake structure to ensure an adequate supply of water during low tide conditions. Interior walls are of reinforced masonry concrete. Portions of the operating floor are graded. A 750 sq ft electrical equipment room 13 ft high is located at grade adjacent to the basin.

The hot circulating water is discharged back to the river through a discharge canal. Discharge occurs sufficiently downstream of the intake to minimize recirculation.

Circulating Water Discharge Tunnel and Canal

The circulating water discharge tunnel begins in the turbine building at the condenser outlets and runs outside where it is channeled into the discharge canal. The tunnel is a reinforced concrete box structure 42 ft wide and 14 ft high inside.

The discharge canal is an extension of the tunnel which discharges into the North River 350 ft south of the intake structure. The canal is a reinforced concrete structure, with a flat bottom, vertical walls, and open top. The canal is 42 ft wide with walls 20 ft high. At the river, the canal widens, and the bottom slopes up to insure sufficient water in the canal at all times for maintaining a seal for the circulating water system.

ACCOUNT 262 Mechanical Equipment

Circulating Water Pumps

There are six 16.7 percent capacity circulating water pumps, of the mixed flow vertical type. Each pump is designed for 125,840 gpm with a total dynamic head of 27 ft. Circulating water pump motors are 1,250 hp each, operating at a synchronous speed of 400 rpm. The pumps discharge the water to tne main condensers where heat is absorbed. The water is then discharged through a tunnel and canal, and back to the river.

Circulating Water Intake System

Twelve traveling screens are provided to remove twigs, leaves and other debris from the river water. The traveling screens are 12 ft wide by 45 ft long. They are sized to give a water velocity of 0.5 ft/sec at mean low water. Serving the traveling screens are two 100 percent capacity screen wash pumps with a flow rate of 2,950 gpm and a total dynamic head of 100 ft to wash the screens, when they require cleaning. Vertical trash racks with an automatic rake are provided ahead of the traveling screens. Each screen well is provided with stop logs to allow dewatering (two screens and one pump) for maintenance purposes. To protect the traveling screens against ice during freezing water conditions, two vertical de-icing motor driven pumps each designed for a flowrate of 22,650 gpm at 35 ft head are used to pump warm water from the condenser discharge to the screens.

2.5.2 Natural Draft Towers

ACCOUNT 26 MAIN CONDENSER HEAT REJECTION SYSTEM

ACCOUNT 261 Structures

All of the structures required for the natural draft tower are of identical design to those designed for the mechanical draft towers. Design descriptions for the makeup water intake and discharge structures, circulating water pumphouse and makeup water pretreatment building, are presented in the mechanical draft wet tower system description.

ACCOUNT 262 Mechanical Equipment

There are four 25 percent capacity circulating water pumps of the mixed flow vertical type. Each pump is designed for a flowrate of 111,000 gpm with a total dynamic head of 102 ft. Circulating water pump motors are 3500 hp each, operating at a synchronous speed of 400 rpm.

Cooling Towers

There is one natural draft tower designed to cool the entire circulating water flow of 460,000 gpm from 118 F to 92 F when operating at wet bulb and dry bulb temperatures of 74 F and 93 F, respectively. To provide the draft required for airflow, the tower employs a reinforced concrete hyperbolic shell 513 ft high. At the base the diameter is 396 ft. Other design characteristics of the natural draft tower are in the subsection 2.3.2 which describes the PWR's natural draft cooling system.

Main Cooling Tower Makeup and Blowdown Systems

The makeup water requirements are the same at the design condition for

the natural draft tower as the mechanical draft towers. This allows the use of identical makeup and blowdown facilities, as designed for the mechanical draft tower.

2.5.3 Fan-Assisted Natural Draft Towers

ACCOUNT 26 MAIN CONDENSER HEAT REJECTION SYSTEM

ACCOUNT 261 Structures

All of the structures required for the fan-assisted natural draft towers are of identical design to those designed for the mechanical draft towers. Design descriptions for the makeup water intake and discharge structures, circulating water pumphouse and makeup water pretreatment building, are presented in the mechanical draft tower system description.

ACCOUNT 262 Mechanical Equipment

Circulating Water Pumps

There are four 25 percent capacity circulating water pumps of the mixed flow vertical type. Each pump is designed for a flowrate of 111,000 gpm with a total dynamic head of 87 ft. Circulating water pump motors are 3,000 hp each, operating at a synchronous speed of 400 rpm.

Cooling Towers

There are two fan-assisted natural draft wet cooling towers each sized for one half of the requirements. Each tower is designed to cool 230,000 gpm of water from 118 F to 92 F when operating at a wet bulb of 74 F. Each tower has a base diameter of 207 ft and an overall height of 175 ft. Twenty 28 ft diameter fans are positioned about the periphery of each

tower's base. Other design characteristics of the fan-assisted natural draft tower are as described in subsection 2.3.3 for the PWR's fan-assisted natural draft cooling system.

TABLE 2-7

PAGE 1

PLANT CODE 698 | COST BASIS 07/76

COST ESTIMATE - 1200 MWe HIGH SULFUR COAL PLANT
ONCE-THROUGH COOLING SYSTEM

03/01/78

ACCT NO.	ACCOUNT DESCRIPTION	FACTORY QUANTITY	FACTORY COSTS	SITE QUANTITY	SITE LABOR HRS	SITE LABOR COST	SITE MATERIAL COST	TOTAL COSTS
2 .	TOTAL DIRECT COSTS							
20 .	LAND AND LAND RIGHTS			1 LT			2,000,000	
21 .	STRUCTURES + IMPROVEMENTS	1 LT	2,555,560	1 LT	1453304 MH	17,106,860	27,524,930	
221.	BOILER PLANT EQUIPMENT (1)	1 LT	52,660,980	1 LT	1801944 MH	22,706,540	8,386,420	
222.	BOILER PLANT EQUIPMENT (2)	1 LT	52,660,980	1 LT	1801944 MH	22,706,540	8,386,420	
23 .	TURBINE PLANT EQUIPMENT*	1 LT	78,473,940	1 LT	1821069 MH	23,273,260	5,248,630	
24 .	ELECTRIC PLANT EQUIPMENT*	1 LT	8,629,170	1 LT	1202431 MH	14,752,240	8,919,270	
25 .	MISCELLANEOUS PLANT EQUIPT	1 LT	5,722,267	1 LT	259176 MH	3,323,701	811,186	
26 .	MAIN COND HEAT REJECT SYS							
261.	STRUCTURES							
261.1	MAKEUP WTR INT + DISCH STR							
261.11	INTAKE STRUCTURE							
261.111	EXCAVATION WORK							
261.1111	EARTH EXCAVATION			3125 CY	781 MH	9,130	3,125	
261.1112	ROCK EXCAVATION			12200 CY	976C MH	114,095	48,800	
261.1113	SHEETING (TEMP COFFERDAM)			130 TN	2600 MH	35,672	22,100	
261.1114	STRCT STL (TEMP COFFERDAM)							
261.1115	PUMPING			1 LT	725C MH	67,570	68,000	
	261.111 EXCAVATION WORK				20391 MH	226,467	142,025	368,492
261.112	BEARING PILES (STEEL)							
261.113	SUBSTRUCTURE CONCRETE							

* Detailed breakdown for these accounts are found in Table 2-27 and 2-28 respectively

PLANT CODE 698 | COST BASIS 07/76

COST ESTIMATE - 1200 MWe HIGH SULFUR COAL PLANT
ONCE-THROUGH COOLING SYSTEM

03/01/78

ACCT NO.	ACCOUNT DESCRIPTION	FACTORY QUANTITY	FACTORY COSTS	SITE QUANTITY	SITE LABOR HRS	SITE LABOR COST	SITE MATERIAL COST	TOTAL COSTS
261.1131	FORM WORK			78800 SF	31520 MH	348,056	78,800	
261.1132	REINFORCING STEEL			330 TN	8251 MH	106,546	123,750	
261.1133	CONCRETE			4400 CY	3300 MH	33,700	140,800	
261.1134	EMBEDDED STEEL			22 TN	2750 MH	33,073	30,800	
261.1135	CONCRETE FINISH			44000 SF	440 MH	4,494	440	
261.1136	WATERPROOFING							
261.1137	CONSTRUCTION JOINTS			1091 SF	1092 MH	12,058	1,091	
261.1138	RUBBING CONCRETE SURFACES							
	261.113 SUBSTRUCTURE CONCRETE				47353 MH	537,927	375,681	913,608
261.114	SUPERSTRUCTURE							
261.1141	CONCRETE WORK							
261.1142	STRUCTURAL + MISC. STEEL							
261.11421	STRUCTURAL STEEL							
261.11422	GRATING (GALV)			975 SF	166 MH	2,162	2,925	
261.11423	HANDRAIL			225 LF	135 MH	1,757	2,250	
	261.1142 STRUCTURAL + MISC. STEEL				301 MH	3,919	5,175	9,094
261.1143	EXTERIOR WALLS							
261.11431	CONCRETE							
261.11432	MASONRY			1375 SF	344 MH	3,925	3,850	
	261.1143 EXTERIOR WALLS				344 MH	3,925	3,850	7,775
261.1144	ROOF DECK							

TABLE 2-7

PLANT CODE 698 | COST BASIS 07/76 | COST ESTIMATE - 1200 MWe HIGH SULFUR COAL PLANT ONCE-THROUGH COOLING SYSTEM | | 03/01/78

ACCT NO.	ACCOUNT DESCRIPTION	FACTORY QUANTITY	FACTORY COSTS	SITE QUANTITY	SITE LABOR HRS	SITE LABOR COST	SITE MATERIAL COST	TOTAL COSTS
261.11441	METAL ROOF DECK			75C SF	45 MH	586	750	
	261.1144 ROOF DECK				45 MH	586	750	1,336
261.1145	ROOFING + FLASHING							
261.11451	B.U. ROOFG, INSULTN, + FLA			75C SF	53 MH	714	938	
	261.1145 ROOFING + FLASHING				53 MH	714	938	1,652
261.1146	INTERIOR WALLS							
261.11461	CONCRETE WALLS							
261.11462	MASONRY WALLS			25C SF	6C MH	685	700	
261.11463	PARTITIONS							
	261.1146 INTERIOR WALLS				60 MH	685	700	1,385
261.1147	DOORS + WINDOWS							
261.11471	ROLLING STEEL DOORS			100 SF	5C MH	651	1,400	
261.11472	PERSONNEL DOORS			96 SF	67 MH	777	1,152	
261.11473	SASH + GLAZING							
	261.1147 DOORS + WINDOWS				117 MH	1,428	2,552	3,980
261.1149	PAINTING							
261.11491	CONCRETE							
261.11492	STEELWORK			22 TN	11C MH	1,053	132	
261.11493	METAL DECK			75C SF	15 MH	144	150	
261.11494	HANDRAIL			200 LF	4C MH	383	20	
	261.1149 PAINTING				165 MH	1,580	302	1,882

PLANT CODE 698 | COST BASIS 07/76

COST ESTIMATE - 1200 MWe HIGH SULFUR COAL PLANT
ONCE-THROUGH COOLING SYSTEM

03/01/78

ACCT NO.	ACCOUNT DESCRIPTION	FACTORY QUANTITY	FACTORY COSTS	SITE QUANTITY	SITE LABOR HRS	SITE LABOR COST	SITE MATERIAL COST	TOTAL COSTS
	261.114 SUPERSTRUCTURE				1085 MH	12,837	14,267	27,104
261.117	BULKHEAD							
261.1171	STEEL SHEETING			65 TN	650 MH	8,918	22,750	
261.1172	STRUCTURAL STEEL			4 TN	60 MH	782	2,900	
261.1173	GRAVEL FILL							
261.1174	DREDGING			19710 CY	3942 MH	49,196	39,420	
261.1175	RIP-RAP (12 IN. THICK)			215 CY	323 MH	3,216	2,150	
261.1176	CHAIN LINK FENCE(7FT HIGH)			413 LF	124 MH	1,156	2,685	
	261.117 BULKHEAD				5099 MH	63,268	69,905	133,173
261.118	PROTECTIVE DOLPHINS							
261.1181	WOOD PILES			2450 LF	490 MH	6,723	9,800	
	261.118 PROTECTIVE DOLPHINS				490 MH	6,723	9,800	16,523
261.119	BUILDING SERVICES							
261.1191	PLUMBING + DRAINS			5 EA	625 MH	8,099	5,000	
261.1192	HEATING + VENTILATING	1 LT	3,400	1 LT	193 MH	2,494	249	
261.1193	LIGHTING + SERVICE POWER			750 SF	226 MH	2,779	1,350	
	261.119 BUILDING SERVICES		3,400		1044 MH	13,372	6,599	23,371
	261.11 INTAKE STRUCTURE		3,400		75462 MH	860,594	618,277	1,482,271
	261.1 MAKEUP WTR INT + DISCH STR		3,400		75462 MH	860,594	618,277	1,482,271
261.4	CHLORINATION BUILDING							

TABLE 2-7

PLANT CODE 698 | COST BASIS 07/76

COST ESTIMATE - 1200 MWe HIGH SULFUR COAL PLANT
ONCE-THROUGH COOLING SYSTEM

03/01/78

ACCT NO.	ACCOUNT DESCRIPTION	FACTORY QUANTITY	FACTORY COSTS	SITE QUANTITY	SITE LABOR HRS	SITE LABOR COST	SITE MATERIAL COST	TOTAL COSTS
261.41	BUILDING STRUCTURE							
261.411	EXCAVATION WORK							
261.4111	EARTH EXCAVATION			53 CY	13 MH	140	53	
261.4114	BACKFILL			41 CY	12 MH	118	41	
	261.411 EXCAVATION WORK				25 MH	258	94	352
261.413	SUBSTRUCTURE CONCRETE							
261.4131	FORMWORK			216 SF	85 MH	938	216	
261.4132	REINF.STEEL			2 TN	51 MH	657	750	
261.4133	CONCRETE			12 CY	9 MH	91	384	
261.4134	EMBEDDED STEEL							
261.4135	FLOOR FINISH			105 SF	1 MH	9	1	
261.4136	WATERPROOFING							
261.4137	CONSTRUCTION JOINTS			50 SF	50 MH	552	50	
261.4138	RUBBING CONCRETE SURFACES							
261.4139	WIRE FABRIC			105 SF	2 MH	27	13	
	261.413 SUBSTRUCTURE CONCRETE				198 MH	2,274	1,414	3,688
261.414	SUPERSTRUCTURE							
261.4141	CONCRETE WORK							
261.4142	STRUCT. + MISC. STEEL							
261.41421	STRUCT. STEEL							
261.41423	MISC. FRAMES, ETC.			2 TN	100 MH	1,302	2,200	

TABLE 2-7

PLANT CODE 698 | COST BASIS 07/76 | COST ESTIMATE - 1200 MWe HIGH SULFUR COAL PLANT ONCE-THROUGH COOLING SYSTEM | 03/01/78

ACCT NO.	ACCOUNT DESCRIPTION	FACTORY QUANTITY	FACTORY COSTS	SITE QUANTITY	SITE LABOR HRS	SITE LABOR COST	SITE MATERIAL COST	TOTAL COSTS
	261.4142 STRUCT. + MISC. STEEL				100 MH	1,302	2,200	3,502
261.4143	EXTERIOR WALLS							
261.41432	MASONRY			310 SF	78 MH	890	868	
	261.4143 EXTERIOR WALLS				78 MH	890	868	1,758
261.4144	ROOF DECK							
261.41441	METAL ROOF DECK			170 SF	10 MH	131	170	
	261.4144 ROOF DECK				10 MH	131	170	301
261.4145	ROOFING + FLASHING							
261.41451	B.U.ROOFING,FLASHING+INSUL			170 SF	12 MH	162	213	
	261.4145 ROOFING + FLASHING				12 MH	162	213	375
261.4147	DOORS + WINDOWS							
261.41472	PERSONNEL DOORS			50 SF	35 MH	406	600	
261.41473	SASH + GLAZING			25 SF	10 MH	116	300	
	261.4147 DOORS + WINDOWS				45 MH	522	900	1,422
261.4149	PAINTING							
261.41492	STEELWORK			2 TN	10 MH	96	12	
261.41493	METAL DECK			170 SF	3 MH	29	17	
	261.4149 PAINTING				13 MH	125	29	154
	261.414 SUPERSTRUCTURE				258 MH	3,132	4,380	7,512

TABLE 2-7

PLANT CODE 698 | COST BASIS 07/76 | COST ESTIMATE - 1200 MWe HIGH SULFUR COAL PLANT ONCE-THROUGH COOLING SYSTEM | PAGE 7 | 03/01/78

ACCT NO.	ACCOUNT DESCRIPTION	FACTORY QUANTITY	FACTORY COSTS	SITE QUANTITY	SITE LABOR HRS	SITE LABOR COST	SITE MATERIAL COST	TOTAL COSTS
	261.41 BUILDING STRUCTURE				481 MH	5,664	5,888	11,552
261.424	LIGHTING + SERVICE POWER							
	261.4 CHLORINATION BUILDING				481 MH	5,664	5,888	11,552
261.5	DISCHARGE TUNNEL + CANAL							
261.51	EXCAVATION							
261.511	EARTH EXCAVATION			21200 CY	530C MH	56,765	21,200	
261.512	ROCK EXCAVATION			27500 CY	22000 MH	235,628	110,000	
261.514	BACKFILL			10630 CY	3189 MH	34,155	10,630	
261.515	DEWATERING							
	261.51 EXCAVATION				30489 MH	326,048	141,830	468,378
261.53	SUBSTRUCTURE CONCRETE							
261.531	FORM&CRK			104000 SF	41600 MH	459,364	104,000	
261.532	REINFORCING STEEL			780 TN	19500 MH	251,810	312,000	
261.533	CONCRETE			10400 CY	7800 MH	79,654	364,000	
261.534	EMBEDDED STEEL							
261.535	FLOOR FINISH							
261.536	WATERPROOFING							
261.537	CONSTRUCTION JOINTS			5400 SF	5400 MH	59,629	5,400	
261.538	RUBBING CONCRETE SURFACES							
	261.53 SUBSTRUCTURE CONCRETE				74300 MH	850,457	785,400	1,635,857
	261.5 DISCHARGE TUNNEL + CANAL				104789 MH	1,177,005	927,230	2,104,235

TABLE 2-7

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COST ESTIMATE - 1200 MW+ HIGH SULFUR COAL PLANT
ONCE-THROUGH COOLING SYSTEM

03/01/78

ACCT NO.	ACCOUNT DESCRIPTION	FACTORY QUANTITY	FACTORY COSTS	SITE QUANTITY	SITE LABOR HRS	SITE LABOR COST	SITE MATERIAL COST	TOTAL COSTS
261.	STRUCTURES		3,400		180732 MH	2,043,263	1,551,395	3,598,058
262.	MECHANICAL EQUIPMENT							
262.1	HEAT REJECTION SYSTEM							
262.11	WATER INTAKE EQUIPMENT							
262.111	ROTATING MACHINERY							
262.1111	SCREEN WASH PUMP+MOTOR	2 EA	32,000	1 LT	610 MH	8,062	806	
262.11111	SCREEN WASH PUMP							
262.11112	SCREEN WASH PUMP MOTOR							
	262.1111 SCREEN WASH PUMP+MOTOR		32,300		610 MH	8,062	806	40,868
	262.111 ROTATING MACHINERY		32,000		610 MH	8,062	806	40,868
262.114	PURIFICATION+FILTRATION EQ							
262.1141	TRAVELING SCREENS							
262.11411	CIRCULATING WATER PUMPS	12 EA	672,000	1 LT	19800 MH	256,152	25,615	
262.11412	SCREEN WASH PUMPS	2 EA	62,000	1 LT	600 MH	7,761	776	
	262.1141 TRAVELING SCREENS		734,000		20400 MH	263,913	26,391	1,024,304
262.1142	TRASH RACK	13 EA	113,100	1 LT	3418 MH	44,496	4,450	
262.1143	TRASH RAKE	1 LT	42,000	1 LT	800 MH	10,350	1,035	
262.1144	STOP LOGS							
262.11441	CIRCULATING WATER PUMPS			288 EA	4320 MH	40,262	9,360	

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COST ESTIMATE - 1200 MWe HIGH SULFUR COAL PLANT
ONCE-THROUGH COOLING SYSTEM

03/01/78

ACCT NO.	ACCOUNT DESCRIPTION	FACTORY QUANTITY	FACTORY COSTS	SITE QUANTITY	SITE LABOR HRS	SITE LABOR COST	SITE MATERIAL COST	TOTAL COSTS
262.11442	SCREEN WASH PUMPS			48 EA	480 MH	4,474	864	
	262.1144 STOP LOGS				4800 MH	44,736	10,224	54,960
	262.114 PURIFICATION+FILTRATION EQ		889,100		29418 MH	273,495	42,100	1,294,695
262.115	PIPING-SCREEN WASH							
262.1151	2 IN. + SMALLER							
262.1152	2.5 IN. + LARGER							
262.11521	CS/NNS	24910 LB	37,365	1 LT	3736 MH	48,423	4,842	
	262.1152 2.5 IN. + LARGER		37,365		3736 MH	48,423	4,842	90,630
	262.115 PIPING-SCREEN WASH		37,365		3736 MH	48,423	4,842	90,630
262.116	VALVES-SCREEN WASH	1 LT	22,680					
262.1162	CHECK							
262.1166	BUTTERFLY							
	262.116 VALVES-SCREEN WASH		22,680					22,680
262.117	PIPING-MISC ITEMS							
262.1171	HANGERS + SUPPORTS	3740 LB	5,610					
262.1172	INSULATION							
262.1173	SPECIALTIES							
	262.117 PIPING-MISC ITEMS		5,610					5,610
	262.11 WATER INTAKE EQUIPMENT		986,755		33764 MH	419,980	47,748	1,454,483

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COST ESTIMATE - 1200 MWe HIGH SULFUR COAL PLANT
ONCE-THROUGH COOLING SYSTEM

03/01/78

ACCT NO.	ACCOUNT DESCRIPTION	FACTORY QUANTITY	FACTORY COSTS	SITE QUANTITY	SITE LABOR HRS	SITE LABOR COST	SITE MATERIAL COST	TOTAL COSTS
262.12	CIRCULATING WATER SYSTEM							
262.121	ROTATING MACHINERY							
262.1211	CIRCULATING WATER PUMP+MTR	6 EA	1,302,000	1 LT	16259 MH	214,892	21,489	
262.12111	CIRC WATER PUMP							
262.12112	CIRC WATER PUMP MOTOR							
	262.1211 CIRCULATING WATER PUMP+MTR		1,302,000		16259 MH	214,892	21,489	1,538,381
	262.121 ROTATING MACHINERY		1,302,000		16259 MH	214,892	21,489	1,538,381
262.125	PIPE							
262.1251	2 IN + SMALLER							
262.1252	2.5 IN + LARGER							
262.12521	CONCRETE/NNS	1866 LF	454,408	1 LT	6306 MH	80,820	8,082	
262.12522	CS/NNS	113914 LB	170,871	1 LT	17087 MH	221,455	22,146	
	262.1252 2.5 IN + LARGER		625,279		23393 MH	302,275	30,228	957,782
	262.125 PIPE		625,279		23393 MH	302,275	30,228	957,782
262.126	VALVES							
262.1266	BUTTERFLY	12 EA	238,332	1 LT	1097 MH	14,217	1,422	
	262.126 VALVES		238,332		1097 MH	14,217	1,422	253,971
262.127	PIPING / MISC. ITEMS							
262.1271	HANGERS + SUPPORTS							

TABLE 2-7

PLANT CODE 698 | COST BASIS 07/76 | COST ESTIMATE - 1200 MWe HIGH SULFUR COAL PLANT ONCE-THROUGH COOLING SYSTEM | PAGE 11 | 03/01/78

ACCT NO.	ACCOUNT DESCRIPTION	FACTORY QUANTITY	FACTORY COSTS	SITE QUANTITY	SITE LABOR HRS	SITE LABOR COST	SITE MATERIAL COST	TOTAL COSTS
262.1272	INSULATION							
262.1273	SPECIALTIES							
262.12731	EXPANSION JOINTS	1 LT	60,180	1 LT	75 MH	974	97	
	262.1273 SPECIALTIES		60,180		75 MH	974	97	61,251
262.1274	PIPE TRENCHING							
262.12741	EXCAVATION							
262.127411	EARTH EXCAVATION			8868 CY	2217 MH	23,743	8,868	
262.127412	ROCK EXCAVATION			6157 CY	4925 MH	52,749	24,628	
	262.12741 EXCAVATION				7142 MH	76,492	33,496	109,988
262.12742	BACKFILL			8326 CY	2498 MH	24,861	8,326	
262.12743	COMPACTED SAND [illegible]			3583 CY	3583 MH	35,679	21,498	
262.12744	SUBSTRUCTURE CONCRETE							
262.127441	FORMWORK			4100 SF	1640 MH	18,111	4,100	
262.127442	REINF STEEL			38 TN	951 MH	12,278	15,200	
262.127443	CONCRETE			506 CY	380 MH	3,880	17,710	
	262.12744 SUBSTRUCTURE CONCRETE				2971 MH	34,269	37,010	71,279
	262.1274 PIPE TRENCHING				16794 MH	171,281	100,330	271,611
	262.127 PIPING / MISC. ITEMS		60,180		16269 MH	172,255	100,427	332,862
262.128	INSTRUMENTATION + CONTROL	1 LT	8,025	1 LT	60 MH	733	37	
262.129	SKIDS / FOUNDATIONS							

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COST ESTIMATE - 1200 MWe HIGH SULFUR COAL PLANT
ONCE-THROUGH COOLING SYSTEM

03/01/78

ACCT NO.	ACCOUNT DESCRIPTION	FACTORY QUANTITY	FACTORY COSTS	SITE QUANTITY	SITE LABOR HRS	SITE LABOR COST	SITE MATERIAL COST	TOTAL COSTS
262.1291	CHLORINATION SYSTEM	1 LT	105,350	1 LT	2600 MH	33,636	3,364	
262.129	SKIDS / FOUNDATIONS		105,350		2600 MH	33,636	3,364	142,350
262.12	CIRCULATING WATER SYSTEM		2,339,166		59678 MH	738,008	156,967	3,234,141
262.16	DE-ICING SYSTEM							
262.161	ROTATING MACHINERY							
262.1611	DE-ICING PUMPS + MOTORS	2 EA	63,300	1 LT	1423 MH	18,808	1,881	
262.16111	DE-ICING PUMPS							
262.16112	DE-ICING PUMP MOTORS							
262.1611	DE-ICING PUMPS + MOTORS		63,300		1423 MH	18,808	1,881	83,989
262.161	ROTATING MACHINERY		63,300		1423 MH	18,808	1,881	83,989
262.165	PIPING							
262.1651	2 IN. + SMALLER							
262.1652	2.5 IN. + LARGER							
262.16521	CONCRETE	700 LF	16,471	1 LT	239 MH	3,063	306	
262.1652	2.5 IN. + LARGER		16,471		239 MH	3,063	306	19,840
262.165	PIPING		16,471		239 MH	3,063	306	19,840
262.166	VALVES	2 EA	14,000		74 MH	961		
262.167	EXCAVATION							
262.1671	EARTH EXCAVATION			4038 CY	1005 MH	10,807	4,038	

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COST ESTIMATE - 1200 MWe HIGH SULFUR COAL PLANT
ONCE-THROUGH COOLING SYSTEM

03/01/78

ACCT NO.	ACCOUNT DESCRIPTION	FACTORY QUANTITY	FACTORY COSTS	SITE QUANTITY	SITE LABOR HRS	SITE LABOR COST	SITE MATERIAL COST	TOTAL COSTS
262.1672	ROCK EXCAVATION			226 CY	181 MH	1,939	904	
262.1673	BACKFILL			4141 CY	1243 MH	13,314	4,141	
	262.1L EXCAVATION				2433 MH	26,060	9,083	35,143
	262.16 DE-ICING SYSTEM		93,771		4169 MH	48,892	11,270	153,933
	262.1 HEAT REJECTION SYSTEM		3,419,692		97611 MH	1,206,880	215,985	4,842,557
	262. MECHANICAL EQUIPMENT		3,419,692		97611 MH	1,206,880	215,985	4,842,557
	26 . MAIN COND HEAT REJECT SYS		3,423,092		278343 MH	3,250,143	1,767,380	8,440,615
	2 . TOTAL DIRECT COSTS		204,125,989		8618211 MH	107,119,284	63,044,236	374,289,509
9	TOTAL INDIRECT COSTS							
91 .	TOTAL INDIRECT COSTS	1 LT	53,351,000	1 LT	1270000 MH	13,250,000	12,620,000	
	*9 TOTAL INDIRECT COSTS		53,351,000		1270000 MH	13,250,000	12,620,000	79,221,000
	TOTAL BASE COST		257,476,989		9888211 MH	120,369,284	75,664,236	453,510,509

*Detailed Cost Breakdown for Account Number 9., Indirect Costs for Mechanical Wet Towers, is in NUREG-0241 Report.

TABLE 2-8

COST ESTIMATE - 1200 MWe HIGH SULFUR COAL PLANT
NATURAL DRAFT COOLING SYSTEM

Account Number	Account Description	Cost Basis 7/76 FACTORY Quantity	FACTORY Costs	SITE Quantity	SITE Labor Hrs.	SITE Labor Cost	SITE Material Cost	SITE Total Costs
20 .	Land and Land Rights			500 AC			2,000,000	2,000,000
21 .	Structures and Improvements		2,555,564		1453304 MH	17,106,859	27,524,934	47,187,357
22 .	Boiler Plant Equipment		105,321,960		3603888 MH	45,413,075	16,772,845	167,507,880
23 .	Turbine Plant Equipment		81,230,723		1853747 MH	23,706,125	5,291,549	110,228,397
24 .	Electric Plant Equipment*		8,674,213		1203150 MH	14,760,464	8,949,691	32,384,368
25 .	Miscellaneous Plant Equipment		5,722,267		259176 MH	3,323,701	811,186	9,857,154
26 .	Main Condenser Heat Reject System							
261.	Structures		89,971		63552 MH	740,739	674,982	1,505,692
262.	Mechanical Equipment							
262.1	Heat Rejection System							
262.11	Water Intake Equipment							
262.111	Rotating Machinery		2,500		159 MH	2,101	210	
262.114	Purification & Filtration Equip.		131,450		4739 MH	59,171	6,658	
262.115	Piping - Screen Wash		2,730		273 MH	3,539	354	
262.116	Valves - Screen Wash		12,900					
262.117	Piping - Miscellaneous Items		405					
262.11	Water Intake Equipment		149,985		5171 MH	64,811	7,222	222,018
262.12	Circulating Water System							
262.121	Rotating Machinery		1,956,000		11200 MH	148,029	14,803	
262.125	Pipe		695,639		21513 MH	278,005	27,800	
262.126	Valves		289,600		751 MH	9,731	973	
262.127	Piping - Miscellaneous Items				12312 MH	130,264	68,965	

* Detailed cost breakdown for this account is found in Table 2-30

TABLE 2-8

COST ESTIMATE - 1200 MWe HIGH SULFUR COAL PLANT
NATURAL DRAFT COOLING SYSTEM

Account Number		Account Description	Cost Basis 7/76 ------FACTORY------ Quantity	Costs	SITE---------- Quantity	Labor Hrs.	Labor Cost	Material Cost	Total Costs
262.128		Instrumentation and Control		5,350		45 MH	548	27	
262.129		Skids/Foundations		54,825		1646 MH	21,329	2,880	
	262.12	Circulating Water System		3,001,414		47467 MH	587,906	115,448	3,074,768
262.13		Cooling Towers							
262.132		Heat Transfer Equipment		8,551,772		204180 MH	2,642,115	264,212	
262.138		Instrumentation and Control		36,000		350 MH	4,279	214	
	262.13	Cooling Towers		8,857,772		204530 MH	2,646,394	264,426	11,498,592
262.15		Main Ct. Make-up & Blowdown Sys.							
262.151		Make-up Water System		389,642		9930 MH	108,172	31,412	
262.152		Blowdown System		48,950		351 MH	4,487	439	
262.153		Make-up Water Pretreatment System		736,000		32000 MH	413,981	82,796	
	262.15	Main Ct. Make-up & Blowdn. Sys.		1,174,592		42281 MH	526,640	114,647	1,815,879
	262.	Mechanical Equipment		12,913,763		299449 MH	3,825,571	501,743	17,241,257
	26 .	Main Cond. Ht. Reject. Sys.		13,003,734		363001 MH	4,566,490	1,176,725	18,746,949
	2 .	Total Direct Costs		216,508,461		8736266 MH	108,876,714	62,526,930	387,912,105
	*9 .	Total Indirect Costs		53,588,000		1270000 MH	13,250,000	12,620,000	79,438,000
		Total Base Cost		270,096,461		10006266 MH	122,126,714	75,146,930	467,370,105

*Detailed Cost Breakdown for Account Number 9., Indirect Costs for Mechanical Wet Towers, is in NUREG-0241 Report.

TABLE 2-9

COST ESTIMATE - 1200 MWe HIGH SULFUR COAL PLANT
FAN-ASSISTED NATURAL DRAFT COOLING SYSTEM

Account Number	Account Description	Cost Basis 7/76 ------FACTORY------ Quantity	Costs	----------SITE---------- Quantity	Labor Hrs.	Labor Cost	Material Cost	Total Costs
20 .	Land and Land Rights			500 AC			2,000,000	2,000,000
21 .	Structures and Improvements		2,555,564		1453304 MH	17,106,859	27,524,934	47,187,357
22 .	Boiler Plant Equipment		105,321,960		3603888 MH	45,413,075	16,772,845	167,507,880
23 .	Turbine Plant Equipment		81,230,723		1853747 MH	23,706,125	5,291,549	110,228,397
24 .	Electric Plant Equipment*		9,122,078		1252348 MH	15,364,238	9,325,723	33,812,039
25 .	Miscellaneous Plant Equipment		5,722,267		259176 MH	3,323,701	811,186	9,857,154
26 .	Main Condenser Heat Reject System							
261.	Structures		89,971		63552 MH	740,739	674,982	1,505,692
262.	Mechanical Equipment							
262.1	Heat Rejection System							
262.11	Water Intake Equipment							
262.111	Rotating Machinery		2,500		159 MH	2,101	210	
262.114	Purification & Filtration Equip.		131,450		4739 MH	59,171	6,658	
262.115	Piping - Screen Wash		2,730		273 MH	3,539	354	
262.116	Valves - Screen Wash		12,900					
262.117	Piping - Miscellaneous Items		405					
262.11	Water Intake Equipment		149,985		5171 MH	64,811	7,222	222,018
262.12	Circulating Water System							
262.121	Rotating Machinery		1,796,000		10800 MH	142,742	14,274	
262.125	Pipe		838,832		24154 MH	311,851	31,185	
262.126	Valves		289,600		751 MH	9,731	973	
262.127	Piping - Miscellaneous Items				20988 MH	220,581	107,000	

* Detailed cost breakdown for this account is found in Table 2-29

TABLE 2-9

COST ESTIMATE - 1200 MWe HIGH SULFUR COAL PLANT
FAN-ASSISTED NATURAL DRAFT COOLING SYSTEM

Account Number	Account Description	Cost Basis 7/76 ------FACTORY------ Quantity	Costs	----------SITE---------- Quantity	Labor Hrs.	Labor Cost	Material Cost	Total Costs
262.128	Instrumentation and Control		5,350		45 MH	548	27	
262.129	Skids/Foundations		54,825		1646 MH	21,329	2,880	
262.12	Circulating Water System		2,984,607		58384 MH	706,782	156,339	3,847,728
262.13	Cooling Towers							
262.132	Heat Transfer Equipment		7,621,200		132200 MH	1,710,700	171,070	
262.138	Instrumentation and Control		53,950		451 MH	5,514	276	
262.13	Cooling Towers		7,675,150		132651 MH	1,716,214	171,346	9,562,710
262.15	Main Ct. Make-up & Blowdown Sys.							
262.151	Make-up Water System		389,642		9930 MH	108,172	31,412	
262.152	Blowdown System		48,950		351 MH	4,487	439	
262.153	Make-up Water Pretreatment System		736,000		32000 MH	413,981	82,796	
262.15	Main Ct. Make-up & Blowdn. Sys.		1,174,592		42281 MH	526,640	114,647	1,815,879
262.	Mechanical Equipment		11,934,334		258487 MH	3,014,447	449,554	15,448,335
26 .	Main Cond. Ht. Reject. Sys.		12,074,305		302039 MH	3,755,186	1,124,536	16,954,027
2 .	Total Direct Costs		216,026,897		8724502 MH	108,669,184	62,850,773	387,546,854
*9 .	Total Indirect Costs		53,560,000		1270000 MH	13,250,000	12,620,000	79,430,000
	Total Base Cost		269,586,897		9994502 MH	121,919,184	75,470,773	466,976,854

*Detailed Cost Breakdown for Account Number 9., Indirect Costs for Mechanical Wet Towers, is in NUREG-0241 Report.

2.6 1200 MWe LOW SULFUR COAL-FIRED PLANT COOLING SYSTEMS The cooling requirements for this plant are identical to the requirements of the 1200 MWe high sulfur coal-fired plant. Hence, the design of the alternate cooling systems remain identical and are as presented in subsection 2.5.

TABLE 2-10

PLANT CODE 698 | COST BASIS 07/76 | COST ESTIMATE - 1200 MWe LOW SULFUR COAL PLANT ONCE-THROUGH COOLING SYSTEM | | 03/02/78

ACCT NO.	ACCOUNT DESCRIPTION	FACTORY QUANTITY	FACTORY COSTS	SITE QUANTITY	SITE LABOR HRS	SITE LABOR COST	SITE MATERIAL COST	TOTAL COSTS
2 .	TOTAL DIRECT COSTS							
20 .	LAND AND LAND RIGHTS			1 LT			2,000,000	
21 .	STRUCTURES & IMPROVEMENTS	1 LT	3,155,470	1 LT	1554655 MH	18,013,510	27,552,520	
22 .	BOILER PLANT EQUIPMENT	1 LT	87,151,290	1 LT	2174808 MH	27,375,740	5,951,000	
23 .	TURBINE PLANT EQUIPMENT	1 LT	78,477,940	1 LT	1621069 MH	23,273,260	5,248,630	
24 .	ELECTRIC PLANT EQUIPMENT*	1 LT	7,099,460	1 LT	1000657 MH	12,276,870	7,291,900	
25 .	MISCELLANEOUS PLANT EQUIPT	1 LT	5,722,267	1 LT	259176 MH	3,323,701	811,186	
26 .	MAIN COND HEAT REJECT SYS							
261.	STRUCTURES							
261.1	MAKEUP WTR INT + DISCH STR							
261.11	INTAKE STRUCTURE							
261.111	EXCAVATION WORK							
261.1111	EARTH EXCAVATION			3125 CY	781 MH	9,130	3,125	
261.1112	ROCK EXCAVATION			12200 CY	9760 MH	114,095	48,800	
261.1113	SHEETING (TEMP COFFERDAM)			130 TN	2600 MH	35,672	22,100	
261.1114	STRCT STL (TEMP COFFERDAM)							
261.1115	PUMPING			1 LT	7250 MH	67,570	68,000	
	261.111 EXCAVATION WORK				20391 MH	226,467	142,025	368,492
261.112	BEARING PILES (STEEL)							
261.113	SUBSTRUCTURE CONCRETE							
261.1131	FORMWORK			78800 SF	31520 MH	348,056	78,800	

*Detailed Cost Breakdown for Accounts 23 and 24 are found in Tables 2-31 and 2-32.

TABLE 2-10

PLANT CODE 698 | COST BASIS 07/76

COST ESTIMATE - 1200 MWe LOW SULFUR COAL PLANT
ONCE-THROUGH COOLING SYSTEM

03/02/78

ACCT NO.	ACCOUNT DESCRIPTION	FACTORY QUANTITY	FACTORY COSTS	SITE QUANTITY	SITE LABOR HRS	SITE LABOR COST	SITE MATERIAL COST	TOTAL COSTS
261.1132	REINFORCING STEEL			330 TN	8251 MH	106,546	123,750	
261.1133	CONCRETE			4400 CY	3300 MH	33,700	140,800	
261.1134	EMBEDDED STEEL			22 TN	2750 MH	33,073	30,800	
261.1135	CONCRETE FINISH			44000 SF	440 MH	6,494	440	
261.1136	WATERPROOFING							
261.1137	CONSTRUCTION JOINTS			1091 SF	1092 MH	12,058	1,091	
261.1138	RUBBING CONCRETE SURFACES							
	261.113 SUBSTRUCTURE CONCRETE				47353 MH	537,927	375,681	913,608
261.114	SUPERSTRUCTURE							
261.1141	CONCRETE WORK							
261.1142	STRUCTURAL + MISC. STEEL							
261.11421	STRUCTURAL STEEL							
261.11422	GRATING (GALV)			975 SF	166 MH	2,162	2,925	
261.11423	HANDRAIL			225 LF	135 MH	1,757	2,250	
	261.1142 STRUCTURAL + MISC. STEEL				301 MH	3,919	5,175	9,094
261.1143	EXTERIOR WALLS							
261.11431	CONCRETE							
261.11432	MASONRY			1375 SF	344 MH	3,925	3,850	
	261.1143 EXTERIOR WALLS				344 MH	3,925	3,850	7,775
261.1144	ROOF DECK							
261.11441	METAL ROOF DECK			750 SF	45 MH	586	750	

TABLE 2-10

PLANT CODE 698 | COST BASIS 07/76 | COST ESTIMATE - 1200 MWe LOW SULFUR COAL PLANT ONCE-THROUGH COOLING SYSTEM | 03/02/78

ACCT NO.	ACCOUNT DESCRIPTION	FACTORY QUANTITY	FACTORY COSTS	SITE QUANTITY	SITE LABOR HRS	SITE LABOR COST	SITE MATERIAL COST	TOTAL COSTS
	261.1144 ROOF DECK				45 MH	586	750	1,336
261.1145	ROOFING + FLASHING							
261.11451	B.U. ROOFG, INSULTN, + FLA			750 SF	53 MH	714	938	
	261.1145 ROOFING + FLASHING				53 MH	714	938	1,652
261.1146	INTERIOR WALLS							
261.11461	CONCRETE WALLS							
261.11462	MASONRY WALLS			250 SF	60 MH	685	700	
261.11463	PARTITIONS							
	261.1146 INTERIOR WALLS				60 MH	685	700	1,385
261.1147	DOORS + WINDOWS							
261.11471	ROLLING STEEL DOORS			100 SF	50 MH	651	1,400	
261.11472	PERSONNEL DOORS			96 SF	67 MH	777	1,152	
261.11473	SASH + GLAZING							
	261.1147 DOORS + WINDOWS				117 MH	1,428	2,552	3,980
261.1149	PAINTING							
261.11491	CONCRETE							
261.11492	STEELWORK			22 TN	110 MH	1,053	132	
261.11493	METAL DECK			750 SF	15 MH	144	150	
261.11494	HANDRAIL			200 LF	40 MH	383	20	
	261.1149 PAINTING				165 MH	1,580	302	1,882

ACCT NO.	ACCOUNT DESCRIPTION	FACTORY QUANTITY	FACTORY COSTS	SITE QUANTITY	SITE LABOR HRS	SITE LABOR COST	SITE MATERIAL COST	TOTAL COSTS
	261.114 SUPERSTRUCTURE				1085 MH	12,337	14,267	27,104
261.117	BULKHEAD							
261.1171	STEEL SHEETING			65 TN	650 MH	8,918	22,750	
261.1172	STRUCTURAL STEEL			4 TN	60 MH	782	2,900	
261.1173	GRAVEL FILL							
261.1174	DREDGING			19710 CY	3942 MH	49,196	39,420	
261.1175	RIP-RAP (12 IN. THICK)			215 CY	323 MH	3,216	2,150	
261.1176	CHAIN LINK FENCE(7FT HIGH)			413 LF	124 MH	1,156	2,685	
	261.117 BULKHEAD				5099 MH	63,268	69,905	133,173
261.118	PROTECTIVE DOLPHINS							
261.1181	WOOD PILES			2450 LF	490 MH	6,723	9,800	
	261.118 PROTECTIVE DOLPHINS				490 MH	6,723	9,800	16,523
261.119	BUILDING SERVICES							
261.1191	PLUMBING + DRAINS			5 EA	625 MH	8,099	5,000	
261.1192	HEATING + VENTILATING	1 LT	3,400	1 LT	193 MH	2,494	249	
261.1193	LIGHTING + SERVICE POWER			750 SF	226 MH	2,779	1,350	
	261.119 BUILDING SERVICES		3,400		1044 MH	13,372	6,599	23,371
	261.11 INTAKE STRUCTURE		3,400		75462 MH	860,594	618,277	1,482,271
	261.1 MAKEUP WTR INT + DISCH STR		3,400		75462 MH	860,594	618,277	1,482,271
261.4	CHLORINATION BUILDING							

TABLE 2-10

PLANT CODE 698 | COST BASIS 07/76 | COST ESTIMATE - 1200 MWe LOW SULFUR COAL PLANT ONCE-THROUGH COOLING SYSTEM | | 03/02/78

ACCT NO.	ACCOUNT DESCRIPTION	FACTORY QUANTITY	FACTORY COSTS	SITE QUANTITY	SITE LABOR HRS	SITE LABOR COST	SITE MATERIAL COST	TOTAL COSTS
261.41	BUILDING STRUCTURE							
261.411	EXCAVATION WORK							
261.4111	EARTH EXCAVATION			53 CY	13 MH	140	53	
261.4114	BACKFILL			41 CY	12 MH	118	41	
	261.411 EXCAVATION WORK				25 MH	258	94	352
261.413	SUBSTRUCTURE CONCRETE							
261.4131	FORM&CRK			216 SF	65 MH	938	216	
261.4132	REINF.STEEL			2 TN	51 MH	657	750	
261.4133	CONCRETE			12 CY	9 MH	91	384	
261.4134	EMBEDDED STEEL							
261.4135	FLOOR FINISH			105 SF	1 MH	9	1	
261.4136	WATERPROOFING							
261.4137	CONSTRUCTION JOINTS			50 SF	50 MH	552	50	
261.4138	RUBBING CONCRETE SURFACES							
261.4139	WIRE FABRIC			105 SF	2 MH	27	13	
	261.413 SUBSTRUCTURE CONCRETE				198 MH	2,274	1,414	3,688
261.414	SUPERSTRUCTURE							
261.4141	CONCRETE WORK							
261.4142	STRUCT. & MISC. STEEL							
261.41421	STRUCT. STEEL							
261.41423	MISC. FRAMES, ETC.			2 TN	100 MH	1,302	2,200	

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COST ESTIMATE - 1200 MWe LOW SULFUR COAL PLANT
ONCE-THROUGH COOLING SYSTEM

03/02/78

ACCT NO.	ACCOUNT DESCRIPTION	FACTORY QUANTITY	FACTORY COSTS	SITE QUANTITY	SITE LABOR HRS	SITE LABOR COST	SITE MATERIAL COST	TOTAL COSTS
	261.4142 STRUCT. + MISC. STEEL				100 MH	1,302	2,200	3,502
261.4143	EXTERIOR WALLS							
261.41432	MASONRY			310 SF	28 MH	890	868	
	261.4143 EXTERIOR WALLS				28 MH	890	868	1,758
261.4144	ROOF DECK							
261.41441	METAL ROOF DECK			170 SF	10 MH	131	170	
	261.4144 ROOF DECK				10 MH	131	170	301
261.4145	ROOFING + FLASHING							
261.41451	B.U.ROOFING,FLASHING+INSUL			170 SF	12 MH	162	213	
	261.4145 ROOFING + FLASHING				12 MH	162	213	375
261.4147	DOORS + WINDOWS							
261.41472	PERSONNEL DOORS			50 SF	35 MH	406	600	
261.41473	SASH + GLAZING			25 SF	10 MH	116	300	
	261.4147 DOORS + WINDOWS				45 MH	522	900	1,422
261.4149	PAINTING							
261.41492	STEELWORK			2 TN	10 MH	96	12	
261.41493	METAL DECK			170 SF	3 MH	29	17	
	261.4149 PAINTING				13 MH	125	29	154
	261.414 SUPERSTRUCTURE				258 MH	3,132	4,380	7,512

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COST ESTIMATE - 1200 MWe LOW SULFUR COAL PLANT
ONCE-THROUGH COOLING SYSTEM

03/02/78

ACCT NO.	ACCOUNT DESCRIPTION	FACTORY QUANTITY	FACTORY COSTS	SITE QUANTITY	SITE LABOR HRS	SITE LABOR COST	SITE MATERIAL COST	TOTAL COSTS
	261.41 BUILDING STRUCTURE				481 MH	5,664	5,888	11,552
261.424	LIGHTING + SERVICE POWER							
	261.4 CHLORINATION BUILDING				481 MH	5,664	5,888	11,552
261.5	DISCHARGE TUNNEL + CANAL							
261.51	EXCAVATION							
261.511	EARTH EXCAVATION			21200 CY	530C MH	56,765	21,200	
261.512	ROCK EXCAVATION			27500 CY	22000 MH	235,628	110,000	
261.514	BACKFILL			10630 CY	3189 MH	34,155	10,630	
261.515	DEWATERING							
	261.51 EXCAVATION				30489 MH	326,548	141,830	468,378
261.53	SUBSTRUCTURE CONCRETE							
261.531	FORMWORK			104000 SF	41600 MH	459,364	104,000	
261.532	REINFORCING STEEL			780 TN	1950C MH	251,810	312,000	
261.533	CONCRETE			10400 CY	780C MH	79,654	364,000	
261.534	EMBEDDED STEEL							
261.535	FLOOR FINISH							
261.536	WATERPROOFING							
261.537	CONSTRUCTION JOINTS			5400 SF	5400 MH	59,629	5,400	
261.538	RUBBING CONCRETE SURFACES							
	261.53 SUBSTRUCTURE CONCRETE				7430C MH	850,457	785,400	1,635,857
	261.5 DISCHARGE TUNNEL + CANAL				104789 MH	1,177,005	927,230	2,104,235

ACCT NO.	ACCOUNT DESCRIPTION	FACTORY QUANTITY	FACTORY COSTS	SITE QUANTITY	SITE LABOR HRS	SITE LABOR COST	SITE MATERIAL COST	TOTAL COSTS
	261. STRUCTURES		3,400		180732 MH	2,043,263	1,551,395	3,598,058
262.	MECHANICAL EQUIPMENT							
262.1	HEAT REJECTION SYSTEM							
262.11	WATER INTAKE EQUIPMENT							
262.111	ROTATING MACHINERY							
262.1111	SCREEN WASH PUMP+MOTOR	2 EA	32,000	1 LT	610 MH	8,062	806	
262.11111	SCREEN WASH PUMP							
262.11112	SCREEN WASH PUMP MOTOR							
	262.1111 SCREEN WASH PUMP+MOTOR		32,000		610 MH	8,062	806	40,868
	262.111 ROTATING MACHINERY		32,000		610 MH	8,062	806	40,868
262.114	PURIFICATION+FILTRATION EQ							
262.1141	TRAVELING SCREENS							
262.11411	CIRCULATING WATER PUMPS	12 EA	672,000	1 LT	19800 MH	256,152	25,615	
262.11412	SCREEN WASH PUMPS	2 EA	62,000	1 LT	600 MH	7,761	776	
	262.1141 TRAVELING SCREENS		734,000		20400 MH	263,913	26,391	1,024,304
262.1142	TRASH RACK	13 EA	113,100	1 LT	3418 MH	44,496	4,450	
262.1143	TRASH RAKE	1 LT	42,000	1 LT	800 MH	10,350	1,035	
262.1144	STOP LOGS							
262.11441	CIRCULATING WATER PUMPS			288 EA	4320 MH	40,262	9,360	

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COST ESTIMATE - 1200 MWe LOW SULFUR COAL PLANT
ONCE-THROUGH COOLING SYSTEM

03/02/78

ACCT NO.	ACCOUNT DESCRIPTION	FACTORY QUANTITY	FACTORY COSTS	SITE QUANTITY	SITE LABOR HRS	SITE LABOR COST	SITE MATERIAL COST	TOTAL COSTS
262.11442	SCREEN WASH PUMPS			48 EA	480 MH	4,474	864	
262.1144	STOP LOGS				4800 MH	44,736	10,224	54,960
262.114	PURIFICATION+FILTRATION EQ		889,100		29416 MH	363,495	42,100	1,294,695
262.115	PIPING-SCREEN WASH							
262.1151	2 IN. + SMALLER							
262.1152	2.5 IN. + LARGER							
262.11521	ESTNGS	26910 LB	37,365	1 LT	3736 MH	48,423	4,842	
262.1152	2.5 IN. + LARGER		37,365		3736 MH	48,423	4,842	90,630
262.115	PIPING-SCREEN WASH		37,365		3736 MH	48,423	4,842	90,630
262.116	VALVES-SCREEN WASH	1 LT	22,680					
262.1162	CHECK							
262.1166	BUTTERFLY							
262.116	VALVES-SCREEN WASH		22,680					22,680
262.117	PIPING-MISC ITEMS							
262.1171	HANGERS + SUPPORTS	3740 LB	5,610					
262.1172	INSULATION							
262.1173	SPECIALTIES							
262.117	PIPING-MISC ITEMS		5,610					5,610
262.11	WATER INTAKE EQUIPMENT		986,755		33764 MH	419,980	47,748	1,454,483

TABLE 2-10

PLANT CODE 698 | COST BASIS 07/76

COST ESTIMATE - 1200 MWe LOW SULFUR COAL PLANT
ONCE-THROUGH COOLING SYSTEM

03/02/78

ACCT NO.	ACCOUNT DESCRIPTION	FACTORY QUANTITY	FACTORY COSTS	SITE QUANTITY	SITE LABOR HRS	SITE LABOR COST	SITE MATERIAL COST	TOTAL COSTS
262.12	CIRCULATING WATER SYSTEM							
262.121	ROTATING MACHINERY							
262.1211	CIRCULATING WATER PUMP+MTR	6 EA	1,302,000	1 LT	16259 MH	214,892	21,489	
262.12111	CIRC WATER PUMP							
262.12112	CIRC WATER PUMP MOTOR							
	262.1211 CIRCULATING WATER PUMP+MTR		1,302,000		16259 MH	214,892	21,489	1,538,381
	262.121 ROTATING MACHINERY		1,302,000		16259 MH	214,892	21,489	1,538,381
262.125	PIPE							
262.1251	2 IN + SMALLER							
262.1252	2.5 IN + LARGER							
262.12521	CONCRETE/NNS	1866 LF	454,408	1 LT	6306 MH	80,820	8,082	
262.12522	CS/NNS	113914 LB	170,871	1 LT	17087 MH	221,455	22,146	
	262.1252 2.5 IN + LARGER		625,279		23393 MH	302,275	30,228	957,782
	262.125 PIPE		625,279		23393 MH	302,275	30,228	957,782
262.126	VALVES							
262.1266	BUTTERFLY	12 EA	238,332	1 LT	1097 MH	14,217	1,422	
	262.126 VALVES		238,332		1097 MH	14,217	1,422	253,971
262.127	PIPING / MISC. ITEMS							
262.1271	HANGERS + SUPPORTS							

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COST ESTIMATE - 1200 MWe LOW SULFUR COAL PLANT
ONCE-THROUGH COOLING SYSTEM

03/02/78

ACCT NO.	ACCOUNT DESCRIPTION	FACTORY QUANTITY	FACTORY COSTS	SITE QUANTITY	SITE LABOR HRS	SITE LABOR COST	SITE MATERIAL COST	TOTAL COSTS
262.1272	INSULATION							
262.1273	SPECIALTIES							
262.12731	EXPANSION JOINTS	1 LT	60,180	1 LT	75 MH	974	97	
	262.1273 SPECIALTIES		60,180		75 MH	974	97	61,251
262.1274	PIPE TRENCHING							
262.12741	EXCAVATION							
262.127411	EARTH EXCAVATION			8868 CY	2212 MH	23,743	8,868	
262.127412	ROCK EXCAVATION			6357 CY	4925 MH	52,749	24,628	
	262.12741 EXCAVATION				7142 MH	76,492	33,496	109,988
262.12742	BACKFILL			9326 CY	2498 MH	24,861	8,326	
262.12743	COMPACTED SAND BED			3583 CY	3583 MH	35,659	21,498	
262.12744	SUBSTRUCTURE CONCRETE							
262.127441	FORMWORK			4100 SF	1640 MH	18,111	4,100	
262.127442	REINF STEEL			38 TN	951 MH	12,278	15,200	
262.127443	CONCRETE			506 CY	380 MH	5,880	17,710	
	262.12744 SUBSTRUCTURE CONCRETE				2971 MH	34,269	37,010	71,279
	262.1274 PIPE TRENCHING				16194 MH	171,281	100,330	271,611
	262.127 PIPING / MISC. ITEMS		60,180		16269 MH	172,255	100,427	332,862
262.128	INSTRUMENTATION + CONTROL	1 LT	8,025	1 LT	60 MH	733	37	
262.129	SKIDS / FOUNDATIONS							

TABLE 2-10

PLANT CODE 698 | COST BASIS 07/76

COST ESTIMATE - 1200 MWe LOW SULFUR COAL PLANT
ONCE-THROUGH COOLING SYSTEM

03/02/78

ACCT NO.	ACCOUNT DESCRIPTION	FACTORY QUANTITY	FACTORY COSTS	SITE QUANTITY	SITE LABOR HRS	SITE LABOR COST	SITE MATERIAL COST	TOTAL COSTS
262.1291	CHLORINATION SYSTEM	1 LT	105,350	1 LT	2600 MH	33,636	3,364	
	262.129 SKIDS / FOUNDATIONS		105,350		2600 MH	33,636	3,364	142,350
	262.12 CIRCULATING WATER SYSTEM		2,339,166		59678 MH	738,008	156,967	3,234,141
262.16	DE-ICING SYSTEM							
262.161	ROTATING MACHINERY							
262.1611	DE-ICING PUMPS + MOTORS	2 EA	63,300	1 LT	1423 MH	18,808	1,881	
262.16111	DE-ICING PUMPS							
262.16112	DE-ICING PUMP MOTORS							
	262.1611 DE-ICING PUMPS + MOTORS		63,300		1423 MH	18,808	1,881	83,989
	262.161 ROTATING MACHINERY		63,300		1423 MH	18,808	1,881	83,989
262.165	PIPING							
262.1651	2 IN. + SMALLER							
262.1652	2.5 IN. + LARGER							
262.16521	CONCRETE	700 LF	16,471	1 LT	239 MH	3,063	306	
	262.1652 2.5 IN. + LARGER		16,471		239 MH	3,063	306	19,840
	262.165 PIPING		16,471		239 MH	3,063	306	19,840
262.166	VALVES	2 EA	14,000		74 MH	961		
262.167	EXCAVATION							
262.1671	EARTH EXCAVATION			4038 CY	1009 MH	10,807	4,038	

TABLE 2-10

PLANT CODE 698 | COST BASIS 07/78

COST ESTIMATE - 1200 MWe LOW SULFUR COAL PLANT
ONCE-THROUGH COOLING SYSTEM

03/02/78

ACCT NO.	ACCOUNT DESCRIPTION	FACTORY QUANTITY	FACTORY COSTS	SITE QUANTITY	SITE LABOR HRS	SITE LABOR COST	SITE MATERIAL COST	TOTAL COSTS
262.1672	ROCK EXCAVATION			226 CY	181 MH	1,939	904	
262.1673	BACKFILL			4141 CY	1243 MH	13,314	4,141	
	262.167 EXCAVATION				2433 MH	26,060	9,083	35,143
	262.16 DE-ICING SYSTEM		93,771		4169 MH	48,892	11,270	153,933
	262.1 HEAT REJECTION SYSTEM		3,419,692		97611 MH	1,206,880	215,985	4,842,557
	262. MECHANICAL EQUIPMENT		3,419,692		97611 MH	1,206,880	215,985	4,842,557
	26 . MAIN COND HEAT REJECT SYS		3,423,092		278343 MH	3,250,143	1,767,380	8,440,615
	2 . TOTAL DIRECT COSTS		195,025,519		7088708 MH	87,515,224	50,622,616	323,163,359
9 .	TOTAL INDIRECT COSTS							
91 .	TOTAL INDIRECT COSTS	1 LT	37,589,000	1 LT	1180000 MH	12,313,000	17,772,000	
	*9 . TOTAL INDIRECT COSTS		37,589,000		1180000 MH	12,313,000	17,772,000	67,674,000
	TOTAL BASE COST		222,614,519		8268708 MH	99,828,224	68,394,616	390,837,359

*Detailed Cost Breakdown for Account Number 9., Indirect Costs for Mechanical Wet Towers, is in NUREG-0241 Report.

TABLE 2-11

COST ESTIMATE - 1200 MWe LOW SULFUR COAL PLANT
NATURAL DRAFT COOLING SYSTEM

Account Number		Account Description	Cost Basis 7776 ------FACTORY------ Quantity	Costs	----------SITE---------- Quantity	Labor Hrs.	Labor Cost	Material Cost	Total Costs
20 .		Land and Land Rights			500 AC			2,000,000	2,000,000
21 .		Structures and Improvements		3,155,469		1554635 MH	18,013,514	27,552,314	48,721,497
22 .		Boiler Plant Equipment		87,151,285		2174808 MH	27,375,744	5,950,999	120,478,028
23 .		Turbine Plant Equipment		81,230,723		1853747 MH	23,706,125	5,291,549	110,228,397
24 .		Electric Plant Equipment*		7,144,513		1001376 MH	12,287,089	7,322,314	26,753,916
25 .		Miscellaneous Plant Equipment		5,722,267		259176 MH	3,323,701	811,186	9,857,154
26 .		Main Condenser Heat Reject System							
261.		Structures		89,971		63552 MH	740,739	674,982	1,505,692
262.		Mechanical Equipment							
262.1		Heat Rejection System							
262.11		Water Intake Equipment							
262.111		Rotating Machinery		2,500		159 MH	2,101	210	
262.114		Purification & Filtration Equip.		131,450		4739 MH	59,171	6,658	
262.115		Piping - Screen Wash		2,730		273 MH	3,539	354	
262.116		Valves - Screen Wash		12,900					
262.117		Piping - Miscellaneous Items		405					
	262.11	Water Intake Equipment		149,985		5171 MH	64,811	7,222	222,018
262.12		Circulating Water System							
262.121		Rotating Machinery		1,956,000		11200 MH	148,029	14,803	
262.125		Pipe		695,639		21513 MH	278,005	27,800	
262.126		Valves		289,600		751 MH	9,731	973	
262.127		Piping - Miscellaneous Items				12312 MH	130,264	68,965	

* Detailed cost summary for this account is found in Table 2-34.

TABLE 2-11

COST ESTIMATE - 1200 MWe LOW SULFUR COAL PLANT
NATURAL DRAFT COOLING SYSTEM

Account Number		Account Description	Cost Basis 7/76 ------FACTORY------ Quantity	Costs	----------SITE---------- Quantity	Labor Hrs.	Labor Cost	Material Cost	Total Costs
262.128		Instrumentation and Control		5,350		45 MH	548	27	
262.129		Skids/Foundations		54,825		1646 MH	21,329	2,880	
	262.12	Circulating Water Syster		3,001,414		47467 MH	587,906	115,448	3,704,768
262.13		Cooling Towers							
262.132		Heat Transfer Equipment		8,551,772		204180 MH	2,642,115	264,212	
262.138		Instrumentation and Control		36,000		350 MH	4,279	214	
	262.13	Cooling Towers		8,587,772		204530 MH	2,646,394	264,426	11,498,592
262.15		Main Ct. Make-up & Blowdown Sys.							
262.151		Make-up Water System		389,642		9930 MH	108,172	31,412	
262.152		Blowdown System		48,950		351 MH	4,487	439	
262.153		Make-up Water Pretreatment System		736,000		32000 MH	413,981	82,796	
	262.15	Main Ct. Make-up & Blowdn. Sys.		1,174,592		42281 MH	526,640	114,647	1,815,879
	262.	Mechanical Equipment		12,913,763		299449 MH	3,825,751	501,743	17,241,257
	26 .	Main Cond. Ht. Reject. Sys.		13,003,734		363001 MH	4,566,490	1,176,725	18,746,949
	2 .	Total Direct Costs		197,407,991		7206763 MH	89,272,663	50,105,287	336,785,941
	*9 .	Total Indirect Costs		37,826,000		1180000 MH	12,313,000	17,772,000	67,911,000
		Total Base Cost		235,233,991		8386763 MH	101,585,663	67,877,287	404,696,941

*Detailed Cost Breakdown for Account Number 9., Indirect Costs for Mechanical Wet Towers, is in NUREG-0241 Report.

TABLE 2-12

COST ESTIMATE - 1200 MWe LOW SULFUR COAL PLANT
FAN-ASSISTED NATURAL DRAFT COOLING SYSTEM

Cost Basis
7/76

Account Number	Account Description	FACTORY Quantity	FACTORY Costs	SITE Quantity	SITE Labor Hrs.	SITE Labor Cost	SITE Material Cost	Total Costs
20 .	Land and Land Rights			500 AC			2,000,000	2,000,000
21 .	Structures and Improvements		3,155,469		1554655 MH	18,013,514	27,552,514	48,721,497
22 .	Boiler Plant Equipment		87,151,285		2174808 MH	27,375,744	5,950,999	120,478,028
23 .	Turbine Plant Equipment		81,230,723		1853747 MH	23,706,125	5,291,549	110,228,397
24 .	Electric Plant Equipment*		7,592,378		1050574 MH	12,890,863	7,698,346	28,181,587
25 .	Miscellaneous Plant Equipment		5,722,267		259176 MH	3,323,701	811,186	9,857,154
26 .	Main Condenser Heat Reject System							
261.	Structures		89,971		63552 MH	740,739	674,982	1,505,692
262.	Mechanical Equipment							
262.1	Heat Rejection System							
262.11	Water Intake Equipment							
262.111	Rotating Machinery		2,500		159 MH	2,101	210	
262.114	Purification & Filtration Equip.		131,450		4739 MH	59,171	6,658	
262.115	Piping - Screen Wash		2,730		273 MH	3,539	354	
262.116	Valves - Screen Wash		12,900					
262.117	Piping - Miscellaneous Items		405					
262.11	Water Intake Equipment		149,985		5171 MH	64,811	7,222	222,018
262.12	Circulating Water System							
262.121	Rotating Machinery		1,796,000		10800 MH	142,742	14,274	
262.125	Pipe		838,832		24154 MH	311,851	31,185	
262.126	Valves		289,600		751 MH	9,731	973	
262.127	Piping - Miscellaneous Items				20988 MH	220,581	107,000	

* Detailed cost summary for this account is found in Table 2-33.

TABLE 2-12

COST ESTIMATE - 1200 MWe LOW SULFUR COAL PLANT
FAN-ASSISTED NATURAL DRAFT COOLING SYSTEM

Account Number		Account Description	Cost Basis 7/76 ------FACTORY------ Quantity	Costs	----------SITE---------- Quantity	Labor Hrs.	Labor Cost	Material Cost	Total Costs
262.128		Instrumentation and Control		5,350		45 MH	548	27	
262.129		Skids/Foundations		54,825		1646 MH	21,329	2,880	
	262.12	Circulating Water System		2,984,607		58384 MH	706,782	156,339	3,847,728
262.13		Cooling Towers							
262.132		Heat Transfer Equipment		7,621,200		132200 MH	1,710,700	171,070	
262.138		Instrumentation and Control		53,950		451 MH	5,514	276	
	262.13	Cooling Towers		7,675,150		132651 MH	1,716,214	171,346	9,562,710
262.15		Main Ct. Make-up & Blowdown Sys.							
262.151		Make-up Water System		389,642		9930 MH	108,172	31,412	
262.152		Blowdown System		48,950		351 MH	4,487	439	
262.153		Make-up Water Pretreatment System		736,000		32000 MH	413,981	82,796	
	262.15	Main Ct. Make-up & Blowdn. Sys.		1,174,592		42281 MH	526,640	114,647	1,815,879
	262.	Mechanical Equipment		11,984,334		238487 MH	3,014,447	449,554	15,448,335
	26 .	Main Cond. Ht. Reject. Sys.		12,074,305		302039 MH	3,755,186	1,124,536	16,954,027
	2 .	Total Direct Costs		196,926,427		7194999 MH	89,065,133	50,429,130	336,420,690
	*9 .	Total Indirect Costs		37,798,000		1180000 MH	12,313,000	17,772,000	67,883,000
		Total Base Cost		234,724,427		8374999 MH	101,378,133	68,201,130	404,303,690

*Detailed Cost Breakdown for Account Number 9., Indirect Costs for Mechanical Wet Towers, is in NUREG-0241 Report.

2.7 800 MWe LOW SULFUR COAL FIRED PLANT COOLING SYSTEMS

Design and cost data for the 800 MWe low sulfur coal-fired plant alternate cooling systems are presented in this subsection.

2.7.1 Once-Through Cooling System Design Description

Following are the once-through design descriptions for Account 26 and other accounts impacted by a change from mechanical draft cooling towers to once-through cooling. Design description for accounts not impacted by this change are presented in Reference 4.

ACCOUNT 233 Condensing System

Condenser Equipment

The two surface condensers are single stage one-pass design. The condensers are designed to handle the total heat rejection from the main turbines. Each condenser has a condensing surface of 147,700 sq ft; 13,590 one and 1/8 inch diameter tubes, 37 ft long, and 20 BWG 90-10 CuNi. Cooling Water flow in each condenser is 268,500 gpm resulting in a tube velocity of 7.25 ft/sec and a temperature rise at full load of 15 F.

The balance of the condensing equipment is not affected by the once-through cooling system design and equipment descriptions are presented in Reference 4.

ACCOUNT 261 Structures

Intake and discharge structures are located along the riverbank west of the main plant structure. The intake basin is 146 ft long, 46 ft wide and 48 ft deep and is entirely below plant grade. The volume of the basin is approximately 322,000 cu ft. Attached to the north end of the structure

is a service water pump basin founded 30 ft below grade. The structure is reinforced concrete with foundation mat bearing on rock. There are six circulating water pumps supported from the reinforced concrete basin roof slab. The intakes are protected by bar racks, trash rakes, stop logs, traveling screens and a trash pit. Fish escapes are also provided. A channel is excavated in the river bottom from the ship channel to the intake structure to insure an adequate supply of water during low tide conditions. Interior walls are of reinforced masonry concrete. Portions of the operating floor are graded. A 750 sq ft electrical equipment room 13 ft high is located at grade adjacent to the basin.

The hot circulating water is discharged back to the river through a discharge canal. Discharge occurs sufficiently downstream of the intake to minimize recirculation.

Circulating Water Discharge Tunnel and Canal

The circulating water discharge tunnel begins in the turbine building at the condenser outlets and runs outside where it empties into the discharge canal. The tunnel is a reinforced concrete box structure 30 ft wide and 14 ft high inside.

The discharge canal is an extension of the tunnel which discharges into the North River 350 ft south of the intake structure. The canal is a reinforced concrete structure, with a flat bottom, vertical walls, and an open top. The canal is 30 ft wide with walls 20 ft high. At the river, the canal widens, and the bottom slopes up to ensure sufficient water in the canal at all times for maintaining a seal for the circulating water system.

ACCOUNT 262 Mechanical Equipment

Circulating Water Pumps

There are six 16.7 percent capacity circulating water pumps of the mixed flow vertical type. Each pump is designed for 89,500 gpm with a total dynamic head of 27 ft. Circulating water pump motors are 800 hp each, operating at a synchronous speed of 360 rpm. The pumps discharge the water to the main condensers where heat is absorbed. The water is then discharged through a tunnel and canal back to the river.

Circulating Water Intake System

Twelve traveling screens are provided to remove twigs, leaves and other debris from the river water. The traveling screens are 10 ft wide and 43 ft long. They are sized to give a water velocity of 0.5 ft/sec at mean low water. Serving the traveling screens are two 100 percent screen wash pumps with a flow rate of 2,300 gpm and a total dynamic head of 100 ft to wash the screens when they require cleaning. Vertical trash racks with an automatic rake are provided ahead of the traveling screens.

Each screen well is provided with stop logs to allow dewatering (two screens and one pump) for maintenance purposes. To protect the traveling screens against ice during freezing water conditions, two vertical de-icing motor driven pumps each designed for a flowrate of 16,100 gpm at 35 ft head are used to pump warm water from the condenser discharge to the screens.

2.7.2 Natural Draft Towers

ACCOUNT 26 MAIN CONDENSER HEAT REJECTION SYSTEM

ACCOUNT 261 Structures

All of the structures required for the natural draft tower are of identical design to those designed for the mechanical draft towers. Design descriptions for the makeup water intake and discharge structures, circulating water pumphouse and makeup water pretreatment building, are presented in the mechanical draft wet tower system description.

ACCOUNT 262 Mechanical Equipment

Circulating Water Pumps

There are three 33 1/3 percent capacity circulating water pumps of the mixed flow vertical type. Each pump is designed for a flow rate of 104,300 gpm with a total dynamic head of 97 ft. Circulating water pump motors are 3,000 hp each, operating at a synchronous speed of 400 rpm.

Cooling Towers

There is one natural draft tower designed to cool the entire circulating water flow of 324,000 gpm from 118 F to 92 F when operating at wet bulb and dry bulb temperatures of 74 F and 93 F, respectively. In order to provide the draft required for airflow, the tower employs a reinforced concrete hyperbolic shell 450 ft high. At the base the diameter is 348 ft. Other design characteristics of the natural draft tower are in the subsection 2.3.2 which describes the PWR's natural draft cooling system.

Main Cooling Tower Makeup and Blowdown Systems

The makeup water requirements are the same at the design conditions for the natural draft towers as the mechanical draft towers. This allows the use of identical makeup and blowdown facilities, as designed for the mechanical draft towers.

2.7.3 Fan-Assisted Natural Draft Towers

ACCOUNT 26 MAIN CONDENSER HEAT REJECTION SYSTEM

ACCOUNT 261 Structures

All of the structures required for the fan-assisted natural draft towers are of identical design to those designed for the mechanical draft towers. Design descriptions for the makeup water intake and discharge structures, circulating water pumphouse and makeup water pretreatment building, are presented in the mechanical draft wet tower system description.

ACCOUNT 262 Mechanical Equipment

Circulating Water Pumps

There are three 33 1/3 percent capacity circulating water pumps of the mixed flow vertical type. Each pump is designed for a flow rate of 104,300 gpm with a total dynamic head of 89 ft. Circulating water pump motors are 3,000 hp each, operating at a synchronous speed of 400 rpm.

Cooling Towers

There is one fan-assisted natural draft wet cooling tower designed to cool the entire circulating water flow of 324,000 gpm from 118 F to 92 F when operating at a wet bulb of 74 F. The tower has a base diameter of 257 ft and an overall height of 205 ft. Twenty-four 28 ft diameter fans

are positioned about the periphery of the tower's base. Fan motors are 150 hp each. Other design characteristics of the fan-assisted natural draft tower are as described in subsection 2.3.3 for the PWR's fan-assisted natural draft cooling system.

Main Cooling Tower Makeup and Blowdown Systems

The makeup water requirements are the same at the design condition for the fan-assisted natural draft towers as the mechanical draft towers. This allows the use of identical makeup and blowdown facilities, as designed for the mechanical draft towers.

TABLE 2-13

PAGE 1

PLANT CODE 692 | COST BASIS 07/76

COST ESTIMATE - 800 MWe LOW SULFUR COAL PLANT
ONCE-THROUGH COOLING SYSTEM

03/01/78

ACCT NO.	ACCOUNT DESCRIPTION	FACTORY QUANTITY	FACTORY COSTS	SITE QUANTITY	SITE LABOR HRS	SITE LABOR COST	SITE MATERIAL COST	TOTAL COSTS
2 .	TOTAL DIRECT COSTS							
20 .	LAND AND LAND RIGHTS			1 LT			2,000,000	
21 .	STRUCTURES + IMPROVEMENTS	1 LT	2,591,580	1 LT	1239000 MH	14,363,990	21,428,980	
22 .	BOILER PLANT EQUIPMENT	1 LT	63,614,520	1 LT	1551622 MH	19,494,890	3,968,740	
23 .	TURBINE PLANT EQUIPMENT*	1 LT	46,735,030	1 LT	978863 MH	12,427,010	3,230,340	
24 .	ELECTRIC PLANT EQUIPMENT*	1 LT	5,922,910	1 LT	901782 MH	11,064,240	6,878,310	
25 .	MISCELLANEOUS PLANT EQUIPT	1 LT	5,188,759	1 LT	221988 MH	2,842,632	704,962	
26 .	MAIN COND HEAT REJECT SYS							
261.	STRUCTURES							
261.1	MAKEUP WTR INT + DISCH STR							
261.11	INTAKE STRUCTURE							
261.111	EXCAVATION WORK							
261.1111	EARTH EXCAVATION			2700 CY	675 MH	7,890	2,700	
261.1112	ROCK EXCAVATION			9700 CY	7760 MH	90,715	38,800	
261.1113	SHEETING (TEMP COFFERDAM)			120 TN	2400 MH	32,928	20,400	
261.1114	STRCT STL (TEMP COFFERDAM)							
261.1115	PUMPING			1 LT	6500 MH	60,580	61,000	
	261.111 EXCAVATION WORK				17335 MH	192,113	122,900	315,013
261.112	BEARING PILES (STEEL)							
261.113	SUBSTRUCTURE CONCRETE							
261.1131	FORMWORK			70600 SF	28240 MH	311,838	70,600	

*Detailed cost breakdowns for these accounts are found in Tables 2-35 and 2-36 respectively.

TABLE 2-13

PLANT CODE 692 | COST BASIS 07/76

COST ESTIMATE - 800 MWe LOW SULFUR COAL PLANT
OSCE-THROUGH COOLING SYSTEM

03/01/78

ACCT NO.	ACCOUNT DESCRIPTION	FACTORY QUANTITY	FACTORY COSTS	SITE QUANTITY	SITE LABOR HRS	SITE LABOR COST	SITE MATERIAL COST	TOTAL COSTS
261.1132	REINFORCING STEEL			292 TN	7300 MH	94,267	109,500	
261.1133	CONCRETE			3900 CY	2925 MH	29,871	124,800	
261.1134	EMBEDDED STEEL			20 TN	2500 MH	30,067	28,000	
261.1135	CONCRETE FINISH			39000 SF	391 MH	5,993	390	
261.1136	WATERPROOFING							
261.1137	CONSTRUCTION JOINTS			1075 SF	1076 MH	11,882	1,075	
261.1138	RUBBING CONCRETE SURFACES							
	261.113 SUBSTRUCTURE CONCRETE				42432 MH	481,918	334,365	816,283
261.114	SUPERSTRUCTURE							
261.1141	CONCRETE WORK							
261.1142	STRUCTURAL + MISC. STEEL							
261.11421	STRUCTURAL STEEL							
261.11422	GRATING (GALV)			840 SF	143 MH	1,861	2,520	
261.11423	HANDRAIL			200 LF	120 MH	1,564	2,000	
	261.1142 STRUCTURAL + MISC. STEEL				263 MH	3,425	4,520	7,945
261.1143	EXTERIOR WALLS							
261.11431	CONCRETE							
261.11432	MASONRY			1375 SF	344 MH	3,925	3,850	
	261.1143 EXTERIOR WALLS				344 MH	3,925	3,850	7,775
261.1144	ROOF DECK							
261.11441	METAL ROOF DECK			750 SF	45 MH	586	750	

TABLE 2-13

PLANT CODE 692 | COST BASIS 07/76 | COST ESTIMATE - 800 MWe LOW SULFUR COAL PLANT, ONCE-THROUGH COOLING SYSTEM | 03/01/78

ACCT NO.	ACCOUNT DESCRIPTION	FACTORY QUANTITY	FACTORY COSTS	SITE QUANTITY	SITE LABOR HRS	SITE LABOR COST	SITE MATERIAL COST	TOTAL COSTS
	261.1144 ROOF DECK				45 MH	586	750	1,336
261.1145	ROOFING + FLASHING							
261.11451	B.U. ROOFG, INSULTN, + FLA			750 SF	53 MH	714	938	
	261.1145 ROOFING + FLASHING				53 MH	714	938	1,652
261.1146	INTERIOR WALLS							
261.11461	CONCRETE WALLS							
261.11462	MASONRY WALLS			250 SF	60 MH	685	700	
261.11463	PARTITIONS							
	261.1146 INTERIOR WALLS				60 MH	685	700	1,385
261.1147	DOORS + WINDOWS							
261.11471	ROLLING STEEL DOORS			100 SF	50 MH	651	1,400	
261.11472	PERSONNEL DOORS			96 SF	67 MH	777	1,152	
261.11473	SASH + GLAZING							
	261.1147 DOORS + WINDOWS				117 MH	1,428	2,552	3,980
261.1149	PAINTING							
261.11491	CONCRETE							
261.11492	STEELWORK			20 TN	100 MH	957	120	
261.11493	METAL DECK			750 SF	15 MH	144	150	
261.11494	HANDRAIL			200 LF	40 MH	383	20	
	261.1149 PAINTING				155 MH	1,484	290	1,774

TABLE 2-13

PLANT CODE 692 | COST BASIS 07/76 | COST ESTIMATE - 800 MWe LOW SULFUR COAL PLANT ONCE-THROUGH COOLING SYSTEM | 03/01/78

ACCT NO.	ACCOUNT DESCRIPTION	FACTORY QUANTITY	FACTORY COSTS	SITE QUANTITY	SITE LABOR HRS	SITE LABOR COST	SITE MATERIAL COST	TOTAL COSTS
	261.114 SUPERSTRUCTURE				1037 MH	12,247	13,600	25,847
261.117	BULKHEAD							
261.1171	STEEL SHEETING			60 TN	600 MH	8,232	21,000	
261.1172	STRUCTURAL STEEL			4 TN	60 MH	782	2,900	
261.1173	GRAVEL FILL							
261.1174	DREDGING			1854C CY	3708 MH	46,276	37,080	
261.1175	RIP-RAP (12 IN. THICK)			185 CY	278 MH	2,768	1,850	
261.1176	CHAIN LINK FENCE(7FT HIGH)			386 LF	116 MH	1,081	2,509	
	261.117 BULKHEAD				4762 MH	59,139	65,339	124,478
261.118	PROTECTIVE DOLPHINS							
261.1181	WOOD PILES			215C LF	430 MH	5,900	8,600	
	261.118 PROTECTIVE DOLPHINS				430 MH	5,900	8,600	14,500
261.119	BUILDING SERVICES							
261.1191	PLUMBING + DRAINS			5 EA	625 MH	8,099	5,000	
261.1192	HEATING + VENTILATING	1 LT	3,400	1 LT	193 MH	2,494	249	
261.1193	LIGHTING + SERVICE POWER			75C SF	226 MH	2,779	1,350	
	261.119 BUILDING SERVICES		3,400		1044 MH	13,372	6,599	23,371
	261.11 INTAKE STRUCTURE		3,400		67040 MH	784,689	551,403	1,339,492
	261.1 MAKEUP &TR INT + DISCH STR		3,400		67040 MH	784,689	551,403	1,339,492
261.4	CHLORINATION BUILDING							

TABLE 2-13

PLANT CODE 692 | COST BASIS 07/76 | COST ESTIMATE - 800 MWe LOW SULFUR COAL PLANT ONCE-THROUGH COOLING SYSTEM | 03/01/78

ACCT NO.	ACCOUNT DESCRIPTION	FACTORY QUANTITY	FACTORY COSTS	SITE QUANTITY	SITE LABOR HRS	SITE LABOR COST	SITE MATERIAL COST	TOTAL COSTS
261.41	BUILDING STRUCTURE							
261.411	EXCAVATION WORK							
261.4111	EARTH EXCAVATION			53 CY	13 MH	140	53	
261.4114	BACKFILL			41 CY	12 MH	118	41	
	261.411 EXCAVATION WORK				25 MH	258	94	352
261.413	SUBSTRUCTURE CONCRETE							
261.4131	FORMWORK			216 SF	85 MH	938	216	
261.4132	REINF.STEEL			2 TN	51 MH	657	750	
261.4133	CONCRETE			12 CY	9 MH	91	384	
261.4134	EMBEDDED STEEL							
261.4135	FLOOR FINISH			105 SF	1 MH	9	1	
261.4136	WATERPROOFING							
261.4137	CONSTRUCTION JOINTS			50 SF	50 MH	552	50	
261.4138	RUBBING CONCRETE SURFACES							
261.4139	WIRE FABRIC			105 SF	2 MH	27	13	
	261.413 SUBSTRUCTURE CONCRETE				198 MH	2,274	1,414	3,688
261.414	SUPERSTRUCTURE							
261.4141	CONCRETE WORK							
261.4142	STRUCT. + MISC. STEEL							
261.41421	STRUCT. STEEL							
261.41423	MISC. FRAMES, ETC.			2 TN	100 MH	1,302	2,200	

ACCT NO.	ACCOUNT DESCRIPTION	FACTORY QUANTITY	FACTORY COSTS	SITE QUANTITY	SITE LABOR HRS	SITE LABOR COST	SITE MATERIAL COST	TOTAL COSTS
	261.4142 STRUCT. + MISC. STEEL				100 MH	1,302	2,200	3,502
261.4143	EXTERIOR WALLS							
261.41432	MASONRY			110 SF	78 MH	890	868	
	261.4143 EXTERIOR WALLS				78 MH	890	868	1,758
261.4144	ROOF DECK							
261.41441	METAL ROOF DECK			170 SF	10 MH	131	170	
	261.4144 ROOF DECK				10 MH	131	170	301
261.4145	ROOFING + FLASHING							
261.41451	B.U.ROOFING,FLASHING+INSUL			170 SF	12 MH	162	213	
	261.4145 ROOFING + FLASHING				12 MH	162	213	375
261.4147	DOORS + WINDOWS							
261.41472	PERSONNEL DOORS			50 SF	35 MH	406	600	
261.41473	SASH + GLAZING			25 SF	10 MH	116	300	
	261.4147 DOORS + WINDOWS				45 MH	522	900	1,422
261.4149	PAINTING							
261.41492	STEELWORK			2 TN	10 MH	96	12	
261.41493	METAL DECK			170 SF	3 MH	29	17	
	261.4149 PAINTING				13 MH	125	29	154
	261.414 SUPERSTRUCTURE				258 MH	3,132	4,380	7,512

PLANT CODE 692 | COST BASIS 07/76

COST ESTIMATE - 800 MWe LOW SULFUR COAL PLANT
ONCE-THROUGH COOLING SYSTEM

03/01/78

ACCT NO.	ACCOUNT DESCRIPTION	FACTORY QUANTITY	FACTORY COSTS	SITE QUANTITY	SITE LABOR HRS	SITE LABOR COST	SITE MATERIAL COST	TOTAL COSTS
	261.41 BUILDING STRUCTURE				481 MH	5,664	5,888	11,552
261.424	LIGHTING + SERVICE POWER							
	261.4 CHLORINATION BUILDING				481 MH	5,664	5,888	11,552
261.5	DISCHARGE TUNNEL + CANAL							
261.51	EXCAVATION							
261.511	EARTH EXCAVATION			16070 CY	4018 MH	63,035	16,070	
261.512	ROCK EXCAVATION			19130 CY	15304 MH	163,912	76,520	
261.514	BACKFILL			8975 CY	2693 MH	28,844	8,975	
261.515	DEWATERING							
	261.51 EXCAVATION				22015 MH	235,791	101,565	337,356
261.53	SUBSTRUCTURE CONCRETE							
261.531	FORMWORK			85550 SF	34220 MH	377,871	85,550	
261.532	REINFORCING STEEL			593 TN	14825 MH	191,438	237,200	
261.533	CONCRETE			7900 CY	5925 MH	60,507	276,500	
261.534	EMBEDDED STEEL							
261.535	FLOOR FINISH							
261.536	WATERPROOFING							
261.537	CONSTRUCTION JOINTS			4690 SF	4690 MH	51,790	4,690	
261.538	RUBBING CONCRETE SURFACES							
	261.53 SUBSTRUCTURE CONCRETE				59660 MH	681,606	603,940	1,285,546
	261.5 DISCHARGE TUNNEL + CANAL				81675 MH	917,397	705,505	1,622,902

TABLE 2-13

PLANT CODE 692 | COST BASIS 07/78 | COST ESTIMATE - 900 MWe LOW SULFUR COAL PLANT ONCE-THROUGH COOLING SYSTEM | | 03/01/78

ACCT NO.	ACCOUNT DESCRIPTION	FACTORY QUANTITY	FACTORY COSTS	SITE QUANTITY	SITE LABOR HRS	SITE LABOR COST	SITE MATERIAL COST	TOTAL COSTS
	261. STRUCTURES		3,400		149196 MH	1,687,750	1,262,796	2,953,946
262.	MECHANICAL EQUIPMENT							
262.1	HEAT REJECTION SYSTEM							
262.11	WATER INTAKE EQUIPMENT							
262.111	ROTATING MACHINERY							
262.1111	SCREEN WASH PUMP+MOTOR	2 EA	28,200	1 LT	544 MH	7,190	719	
262.11111	SCREEN WASH PUMP							
262.11112	SCREEN WASH PUMP MOTOR							
	262.1111 SCREEN WASH PUMP+MOTOR		28,200		544 MH	7,190	719	36,109
	262.111 ROTATING MACHINERY		28,200		544 MH	7,190	719	36,109
262.114	PURIFICATION+FILTRATION EQ							
262.1141	TRAVELING SCREENS							
262.11411	CIRCULATING WATER PUMPS	12 EA	604,800	1 LT	19200 MH	248,388	24,839	
262.11412	SCREEN WASH PUMPS	2 EA	60,000	1 LT	600 MH	7,761	776	
	262.1141 TRAVELING SCREENS		664,800		19800 MH	256,149	25,615	946,564
262.1142	TRASH RACK	13 EA	95,030	1 LT	2795 MH	36,383	3,638	
262.1143	TRASH RAKE	1 LT	42,000	1 LT	800 MH	10,350	1,035	
262.1144	STOP LOGS							
262.11441	CIRCULATING WATER PUMPS			276 EA	4140 MH	38,585	8,970	

PLANT CODE 692 | COST BASIS 07/76

COST ESTIMATE - 800 MWe LOW SULFUR COAL PLANT
ONCE-THROUGH COOLING SYSTEM

03/01/78

ACCT NO.	ACCOUNT DESCRIPTION	FACTORY QUANTITY	FACTORY COSTS	SITE QUANTITY	SITE LABOR HRS	SITE LABOR COST	SITE MATERIAL COST	TOTAL COSTS
262.11442	SCREEN WASH PUMPS			46 EA	460 MH	4,287	828	
	262.1144 STOP LOGS				4600 MH	42,872	9,798	52,670
	262.114 PURIFICATION+FILTRATION EQ		801,930		27995 MH	345,754	40,086	1,187,670
262.115	PIPING-SCREEN WASH							
262.1151	2 IN. + SMALLER							
262.1152	2.5 IN. + LARGER							
262.11521	CS/NNS	20260 LB	30,390	1 LT	3039 MH	39,385	3,939	
	262.1152 2.5 IN. + LARGER		30,390		3039 MH	39,385	3,939	73,714
	262.115 PIPING-SCREEN WASH		30,390		3039 MH	39,385	3,939	73,714
262.116	VALVES-SCREEN WASH	1 LT	22,680					
262.1162	CHECK							
262.1166	BUTTERFLY							
	262.116 VALVES-SCREEN WASH		22,680					22,680
262.117	PIPING-MISC ITEMS							
262.1171	HANGERS + SUPPORTS	3040 LB	4,560					
262.1172	INSULATION							
262.1173	SPECIALTIES							
	262.117 PIPING-MISC ITEMS		4,560					4,560
	262.11 WATER INTAKE EQUIPMENT		887,660		31578 MH	392,329	44,744	1,324,733

PLANT CODE 692 | COST BASIS 07/76

COST ESTIMATE - 800 MWe LOW SULFUR COAL PLANT
ONCE-THROUGH COOLING SYSTEM

03/01/78

ACCT NO.	ACCOUNT DESCRIPTION	FACTORY QUANTITY	FACTORY COSTS	SITE QUANTITY	SITE LABOR HRS	SITE LABOR COST	SITE MATERIAL COST	TOTAL COSTS
262.12	CIRCULATING WATER SYSTEM							
262.121	ROTATING MACHINERY							
262.1211	CIRCULATING WATER PUMP+MTR	6 EA	1,026,000	1 LT	12841 MH	169,717	16,972	
262.12111	CIRC WATER PUMP							
262.12112	CIRC WATER PUMP MOTOR							
	262.1211 CIRCULATING WATER PUMP+MTR		1,026,000		12841 MH	169,717	16,972	1,212,689
	262.121 ROTATING MACHINERY		1,026,000		12841 MH	169,717	16,972	1,212,689
262.125	PIPE							
262.1251	2 IN + SMALLER							
262.1252	2.5 IN + LARGER							
262.12521	CONCRETE/NNS	722 LF	349,022	1 LT	3508 MH	44,962	4,496	
262.12522	CS/NNS	69162 LB	103,743	1 LT	10374 MH	134,452	13,445	
	262.1252 2.5 IN + LARGER		452,765		13882 MH	179,414	17,941	650,120
	262.125 PIPE		452,765		13882 MH	179,414	17,941	650,120
262.126	VALVES							
262.1266	BUTTERFLY	10 EA	240,430	1 LT	951 MH	12,322	1,232	
	262.126 VALVES		240,430		951 MH	12,322	1,232	253,984
262.127	PIPING / MISC. ITEMS							
262.1271	HANGERS + SUPPORTS							

TABLE 2-13

PLANT CODE 692 | COST BASIS 07/76

COST ESTIMATE - 800 MWe LOW SULFUR COAL PLANT
ONCE-THROUGH COOLING SYSTEM

ACCT NO.	ACCOUNT DESCRIPTION	FACTORY QUANTITY	FACTORY COSTS	SITE QUANTITY	SITE LABOR HRS	SITE LABOR COST	SITE MATERIAL COST	TOTAL COSTS
262.1272	INSULATION							
262.1273	SPECIALTIES							
262.12731	EXPANSION JOINTS	1 LT	45,840	1 LT	74 MH	961	96	
	262.1273 SPECIALTIES		45,840		74 MH	961	96	46,897
262.1274	PIPE TRENCHING							
262.12741	EXCAVATION							
262.127411	EARTH EXCAVATION			7508 CY	1877 MH	20,103	7,508	
262.127412	ROCK EXCAVATION			6643 CY	5314 MH	56,914	26,572	
	262.12741 EXCAVATION				7191 MH	77,017	34,080	111,097
262.12742	BACKFILL			8365 CY	2510 MH	24,980	8,365	
262.12743	COMPACTED SAND BED			2587 CY	2587 MH	25,744	15,522	
262.12744	SUBSTRUCTURE CONCRETE							
262.127441	FORMWORK			2000 SF	800 MH	8,834	2,000	
262.127442	REINF STEEL			20 TN	500 MH	6,456	8,000	
262.127443	CONCRETE			265 CY	199 MH	2,032	9,275	
	262.12744 SUBSTRUCTURE CONCRETE				1499 MH	17,322	19,275	36,597
	262.1274 PIPE TRENCHING				13787 MH	145,063	77,242	222,305
	262.127 PIPING / MISC. ITEMS		45,840		13861 MH	146,024	77,338	269,202
262.128	INSTRUMENTATION + CONTROL	1 LT	8,025	1 LT	60 MH	733	37	
262.129	SKIDS / FOUNDATIONS							

TABLE 2-13

PLANT CODE 692 | COST BASIS 07/76 | COST ESTIMATE - 800 MWe LOW SULFUR COAL PLANT ONCE-THROUGH COOLING SYSTEM | | 03/01/78

ACCT NO.	ACCOUNT DESCRIPTION	FACTORY QUANTITY	FACTORY COSTS	SITE QUANTITY	SITE LABOR HRS	SITE LABOR COST	SITE MATERIAL COST	TOTAL COSTS
262.1291	CHLORINATION SYSTEM	1 LT	80,000	1 LT	2000 MH	25,874	2,587	
	262.129 SKIDS / FOUNDATIONS		80,000		2000 MH	25,874	2,587	108,461
	262.12 CIRCULATING WATER SYSTEM		1,853,060		43595 MH	534,084	116,107	2,503,251
262.16	DE-ICING SYSTEM							
262.161	ROTATING MACHINERY							
262.1611	DE-ICING PUMPS + MOTORS	2 EA	49,900	1 LT	1120 MH	14,804	1,480	
262.16111	DE-ICING PUMPS							
262.16112	DE-ICING PUMP MOTORS							
	262.1611 DE-ICING PUMPS + MOTORS		49,900		1120 MH	14,804	1,480	66,184
	262.161 ROTATING MACHINERY		49,900		1120 MH	14,804	1,480	66,184
262.165	PIPING							
262.1651	2 IN. + SMALLER							
262.1652	2.5 IN. + LARGER							
262.16521	CONCRETE	680 LF	12,594	1 LT	218 MH	2,793	279	
	262.1652 2.5 IN. + LARGER		12,594		218 MH	2,793	279	15,666
	262.165 PIPING		12,594		218 MH	2,793	279	15,666
262.166	VALVES	2 EA	13,600		71 MH	920		
262.167	EXCAVATION							
262.1671	EARTH EXCAVATION			4003 CY	1000 MH	10,710	4,003	

TABLE 2-13

PLANT CODE 692 | COST BASIS 07/76

COST ESTIMATE - 800 MWe LOW SULFUR COAL PLANT
ONCE-THROUGH COOLING SYSTEM

03/01/78

ACCT NO.	ACCOUNT DESCRIPTION	FACTORY QUANTITY	FACTORY COSTS	SITE QUANTITY	SITE LABOR HRS	SITE LABOR COST	SITE MATERIAL COST	TOTAL COSTS
262.1672	ROCK EXCAVATION			166 CY	132 MH	1,414	664	
262.1673	BACKFILL			4066 CY	1220 MH	13,068	4,066	
	262.167 EXCAVATION				2352 MH	25,192	8,733	33,925
	262.16 DE-ICING SYSTEM		76,094		3761 MH	43,709	10,492	130,295
	262.1 HEAT REJECTION SYSTEM		2,816,814		78934 MH	970,122	171,343	3,958,279
	262. MECHANICAL EQUIPMENT		2,816,814		78934 MH	970,122	171,343	3,958,279
	26 . MAIN COND HEAT REJECT SYS		2,820,214		228130 MH	2,657,872	1,434,139	6,912,225
	2 . TOTAL DIRECT COSTS		126,873,013		5121385 MH	62,850,634	39,645,471	229,369,118
9	TOTAL INDIRECT COSTS							
91 .	TOTAL INDIRECT COSTS	1 LT	29,569,000	1 LT	800000 MH	8,338,500	11,142,000	
	*9 TOTAL INDIRECT COSTS		29,569,000		800000 MH	8,338,500	11,142,000	49,049,500
	TOTAL BASE COST		156,442,013		5921385 MH	71,189,134	50,787,471	278,418,618

*Detailed Cost Breakdown for Account Number 9., Indirect Costs for Mechanical Wet Towers, is in NUREG-0241 Report.

TABLE 2-14

COST ESTIMATE - 800 MWe LOW SULFUR COAL PLANT
NATURAL DRAFT COOLING SYSTEM

Account Number		Account Description	Cost Basis 7/76 ------FACTORY------ Quantity	Costs	----------SITE---------- Quantity	Labor Hrs.	Labor Cost	Material Cost	Total Costs
20 .		Land and Land Rights			500 AC			2,000,000	2,000,000
21 .		Structures and Improvements		2,591,575		1239000 MH	14,363,993	21,428,985	38,384,553
22 .		Boiler Plant Equipment		63,614,516		1551622 MH	19,494,886	3,968,738	87,078,140
23 .		Turbine Plant Equipment		49,109,337		1007161 MH	12,805,021	3,268,137	65,182,495
24 .		Electric Plant Equipment*		5,949,381		901154 MH	11,056,939	6,893,761	23,899,181
25 .		Miscellaneous Plant Equipment		5,188,759		221988 MH	2,842,632	704,962	8,736,353
26 .		Main Condenser Heat Reject System							
261.		Structures		78,213		51157 MH	596,665	556,810	1,231,688
262.		Mechanical Equipment							
262.1		Heat Rejection System							
262.11		Water Intake Equipment							
262.111		Rotating Machinery		2,000		151 MH	1,996	200	
262.114		Purification & Filtration Equip.		125,500		4620 MH	57,899	6,439	
262.115		Piping - Screen Wash		2,730		273 MH	3,539	354	
262.116		Valves - Screen Wash		12,900					
262.117		Piping - Miscellaneous Items		405					
	262.11	Water Intake Equipment		143,535		5044 MH	63,434	6,993	213,962
262.12		Circulating Water System							
262.121		Rotating Machinery		1,395,000		8250 MH	109,040	10,904	
262.125		Pipe		455,299		17254 MH	222,991	22,299	
262.126		Valves		201,250		560 MH	7,258	726	
262.127		Piping - Miscellaneous Items				11860 MH	125,196	65,496	

* Detailed cost breakdown for this account if found in Table 2-38.

TABLE 2-14

COST ESTIMATE - 800 MWe LOW SULFUR COAL PLANT
NATURAL DRAFT COOLING SYSTEM

Account Number		Account Description	Cost Basis 7/76 FACTORY Quantity	FACTORY Costs	SITE Quantity	SITE Labor Hrs.	SITE Labor Cost	SITE Material Cost	Total Costs
262.128		Instrumentation and Control		5,350		45 MH	548	27	
262.129		Skids/Foundations		42,150		1346 MH	17,448	2,492	
	262.12	Circulating Water System		2,099,049		39315 MH	482,481	101,944	2,683,474
262.13		Cooling Towers							
262.132		Heat Transfer Equipment		6,810,000		164700 MH	2,131,218	213,122	
262.138		Instrumentation and Control		36,000		350 MH	4,279	214	
	262.13	Cooling Towers		6,846,000		165050 MH	2,135,497	213,336	9,194,833
262.15		Main Ct. Make-up & Blowdown Sys.							
262.151		Make-up Water System		334,060		9665 MH	104,984	30,798	
262.152		Blowdown System		48,950		351 MH	4,487	439	
262.153		Make-up Water Pretreatment System		613,000		28531 MH	369,103	73,821	
	262.15	Main Ct. Make-up & Blowdn. Sys.		996,010		38547 MH	478,574	105,058	1,579,642
	262.	Mechanical Equipment		10,084,594		247956 MH	3,149,986	427,331	13,671,911
	26 .	Main Cond. Ht. Reject. Sys.		10,162,807		299113 MH	3,756,651	984,141	14,903,599
	2 .	Total Direct Costs		136,616,375		5220038 MH	64,319,222	39,248,724	240,184,321
	*9 .	Total Indirect Costs		29,777,000		800600 MH	8,338,500	11,142,000	49,257,500
		Total Base Cost		166,393,375		6020038 MH	72,657,722	50,390,724	289,441,821

*Detailed Cost Breakdown for Account Number 9., Indirect Costs for Mechanical Wet Towere, is in NUREG-0241 Report.

TABLE 2-15

COST ESTIMATE - 800 MWe LOW SULFUR COAL PLANT
FAN-ASSISTED NATURAL DRAFT COOLING SYSTEM

Account Number	Account Description	Cost Basis 7/76 ------FACTORY------ Quantity	Costs	----------SITE---------- Quantity	Labor Hrs.	Labor Cost	Material Cost	Total Costs
20 .	Land and Land Rights			500 AC			2,000,000	2,000,000
21 .	Structures and Improvements		2,591,575		1239000 MH	14,363,993	21,428,985	38,384,553
22 .	Boiler Plant Equipment		63,614,516		1551622 MH	19,494,886	3,968,738	87,078,140
23 .	Turbine Plant Equipment		49,109,337		1007161 MH	12,805,021	3,268,137	65,182,495
24 .	Electric Plant Equipment*		6,282,857		939146 MH	11,522,294	7,183,547	24,988,698
25 .	Miscellaneous Plant Equipment		5,188,759		221988 MH	2,842,632	704,962	8,736,353
26 .	Main Condenser Heat Reject System							
261.	Structures		78,213		51157 MH	596,665	556,810	1,231,688
262.	Mechanical Equipment							
262.1	Heat Rejection System							
262.11	Water Intake Equipment							
262.111	Rotating Machinery		2,000		151 MH	1,996	200	
262.114	Purification & Filtration Equip.		125,500		4620 MH	57,899	6,439	
262.115	Piping - Screen Wash		2,730		273 MH	3,539	354	
262.116	Valves - Screen Wash		12,900					
262.117	Piping - Miscellaneous Items		405					
262.11	Water Intake Equipment		143,535		5044 MH	63,434	6,993	213,962
262.12	Circulating Water System							
262.121	Rotating Machinery		1,347,000		8100 MH	107,057	10,706	
262.125	Pipe		455,299		17254 MH	222,991	22,299	
262.126	Valves		201,250		560 MH	7,258	726	
262.127	Piping - Miscellaneous Items				11860 MH	125,196	65,498	

* Detailed cost breakdown for this account if found in Table 2-37.

TABLE 2-15

COST ESTIMATE - 800 MWe LOW SULFUR COAL PLANT
FAN-ASSISTED NATURAL DRAFT COOLING SYSTEM

Account Number		Account Description	Cost Basis 7/76 ------FACTORY------ Quantity	Costs	----------SITE---------- Quantity	Labor Hrs.	Labor Cost	Material Cost	Total Costs
262.128		Instrumentation and Control		5,350		45 MH	548	27	
262.129		Skids/Foundations		42,150		1346 MH	17,448	2,492	
	262.12	Circulating Water System		2,051,049		39165 MH	480,498	101,746	2,633,293
262.13		Cooling Towers							
262.132		Heat Transfer Equipment		4,974,200		84350 MH	1,091,489	109,149	
262.138		Instrumentation and Control		53,950		451 MH	5,514	276	
	262.13	Cooling Towers		5,028,150		84801 MH	1,097,003	109,425	6,234,578
262.15		Main Ct. Make-up & Blowdown Sys.							
262.151		Make-up Water System		334,060		9665 MH	104,984	30,798	
262.152		Blowdown System		48,950		351 MH	4,487	439	
262.153		Make-up Water Pretreatment Syster		613,000		28531 MH	369,103	73,821	
	262.15	Main Ct. Make-up & Blowdn. Sys.		996,010		38547 MH	478,574	105,058	1,579,642
	262.	Mechanical Equipment		8,218,744		167557 MH	2,119,509	323,222	10,661,475
	26 .	Main Cond. Ht. Reject. Sys.		8,296,957		218714 MH	2,716,174	880,032	11,893,163
	2 .	Total Direct Costs		135,084,001		5177631 MH	63,745,000	39,434,401	238,263,402
	*9 .	Total Indirect Costs		29,700,000		800000 MH	8,338,500	11,142,000	49,180,500
		Total Base Cost		164,784,001		5977631 MH	72,083,500	50,576,401	287,443,902

*Detailed Cost Breakdown for Account Number 9., Indirect Costs for Mechanical Wet Towers, is in NUREG-0241 Report.

2.8 800 MWe HIGH SULFUR COAL-FIRED PLANT COOLING SYSTEMS

The cooling requirements for this plant are identical to the requirements of the 800 MWe low sulfur coal-fired plant. Hence, the design of the alternate cooling systems remain identical and are as presented in subsection 2.7.

TABLE 2-16

PLANT CODE 892 | COST BASIS 07/76

COST ESTIMATE - 800 MWe HIGH SULFUR COAL PLANT
ONCE-THROUGH COOLING SYSTEM

03/02/78

ACCT NO.	ACCOUNT DESCRIPTION	FACTORY QUANTITY	FACTORY COSTS	SITE QUANTITY	SITE LABOR HRS	SITE LABOR COST	SITE MATERIAL COST	TOTAL COSTS
2 .	TOTAL DIRECT COSTS							
20 .	LAND AND LAND RIGHTS			1 LT			2,000,000	
21 .	STRUCTURES + IMPROVEMENTS	1 LT	2,084,780	1 LT	1126623 MH	14,065,050	21,865,140	
22 .	BOILER PLANT EQUIPMENT	1 LT	75,728,940	1 LT	2581618 MH	32,449,810	11,967,200	
23 .	TURBINE PLANT EQUIPMENT	1 LT	46,735,030	1 LT	978863 MH	12,427,010	3,230,340	
24 .	ELECTRIC PLANT EQUIPMENT*	1 LT	7,237,910	1 LT	1046641 MH	12,843,940	7,858,580	
25 .	MISCELLANEOUS PLANT EQUIPT	1 LT	5,168,759	1 LT	221988 MH	2,842,632	704,962	
26 .	MAIN COND HEAT REJECT SYS							
261.	STRUCTURES							
261.1	MAKEUP WTR INT + DISCH STR							
261.11	INTAKE STRUCTURE							
261.111	EXCAVATION WORK							
261.1111	EARTH EXCAVATION			2700 CY	675 MH	7,890	2,700	
261.1112	ROCK EXCAVATION			9700 CY	7760 MH	90,715	38,800	
261.1113	SHEETING (TEMP COFFERDAM)			120 TN	2400 MH	32,928	20,400	
261.1114	STRCT STL (TEMP COFFERDAM)							
261.1115	PUMPING			1 LT	6500 MH	60,580	61,000	
	261.111 EXCAVATION WORK				17335 MH	192,113	122,900	315,013
261.112	BEARING PILES (STEEL)							
261.113	SUBSTRUCTURE CONCRETE							
261.1131	FORMWORK			70600 SF	28240 MH	311,838	70,600	

*Detailed cost summaries for these accounts are found in Tables 2-39 and 2-40.

TABLE 2-16

PLANT CODE 692 | COST BASIS 07/76 | PAGE 2

COST ESTIMATE - 800 MWe HIGH SULFUR COAL PLANT
ONCE-THROUGH COOLING SYSTEM

03/02/78

ACCT NO.	ACCOUNT DESCRIPTION	FACTORY QUANTITY	FACTORY COSTS	SITE QUANTITY	SITE LABOR HRS	SITE LABOR COST	SITE MATERIAL COST	TOTAL COSTS
261.1132	REINFORCING STEEL			222 TN	7300 MH	94,267	109,500	
261.1133	CONCRETE			3900 CY	2925 MH	29,871	124,800	
261.1134	EMBEDDED STEEL			20 TN	2500 MH	30,067	28,000	
261.1135	CONCRETE FINISH			39000 SF	391 MH	3,993	390	
261.1136	WATERPROOFING							
261.1137	CONSTRUCTION JOINTS			1075 SF	1076 MH	11,852	1,075	
261.1138	RUBBING CONCRETE SURFACES							
	261.113 SUBSTRUCTURE CONCRETE				42432 MH	481,918	334,365	816,283
261.114	SUPERSTRUCTURE							
261.1141	CONCRETE WORK							
261.1142	STRUCTURAL + MISC. STEEL							
261.11421	STRUCTURAL ST							
261.11422	GRATING (GALV)			840 SF	143 MH	1,861	2,520	
261.11423	HANDRAIL			200 LF	120 MH	1,564	2,000	
	261.1142 STRUCTURAL + MISC. STEEL				263 MH	3,425	4,520	7,945
261.1143	EXTERIOR WALLS							
261.11431	CONCRETE							
261.11432	MASONRY			1375 SF	344 MH	3,925	3,850	
	261.1143 EXTERIOR WALLS				344 MH	3,925	3,850	7,775
261.1144	ROOF DECK							
261.11441	METAL ROOF DECK			750 SF	45 MH	586	750	

TABLE 2-16

COST ESTIMATE - 800 MWe HIGH SULFUR COAL PLANT
ONCE-THROUGH COOLING SYSTEM

PLANT CODE 692 | COST BASE 07/76 | 03/02/78

ACCT NO.	ACCOUNT DESCRIPTION	FACTORY QUANTITY	FACTORY COSTS	SITE QUANTITY	SITE LABOR HRS	SITE LABOR COST	SITE MATERIAL COST	TOTAL COSTS
	261.1144 ROOF DECK				45 MH	585	750	1,336
261.1145	ROOFING + FLASHING							
261.11451	B.U. ROOFG, INSULTN, + FLR			750 SF	53 MH	714	938	
	261.1145 ROOFING + FLASHING				53 MH	714	938	1,652
261.1146	INTERIOR WALLS							
261.11461	CONCRETE WALLS							
261.11462	MASONRY WALLS			250 SF	60 MH	685	700	
261.11463	PARTITIONS							
	261.1146 INTERIOR WALLS				60 MH	685	700	1,385
261.1147	DOORS + WINDOWS							
261.11471	ROLLING STEEL DOORS			100 SF	50 MH	651	1,400	
261.11472	PERSONNEL DOORS			96 SF	67 MH	777	1,152	
261.11473	SASH + GLAZING							
	261.1147 DOORS + WINDOWS				117 MH	1,428	2,552	3,980
261.1149	PAINTING							
261.11491	CONCRETE			20 TN	100 MH	957	120	
261.11492	STEELWORK			750 SF	15 MH	144	150	
261.11493	METAL DECK			200 LF	40 MH	383	20	
261.11494	HANDRAIL							
	261.1149 PAINTING				155 MH	1,484	290	1,774

TABLE 2-16

PLANT CODE 692 | COST BASIS 07/76 | COST ESTIMATE - 800 MWe HIGH SULFUR COAL PLANT ONCE-THROUGH COOLING SYSTEM | | 03/02/78

ACCT NO.	ACCOUNT DESCRIPTION	FACTORY QUANTITY	FACTORY COSTS	SITE QUANTITY	SITE LABOR HRS	SITE LABOR COST	SITE MATERIAL COST	TOTAL COSTS
	261.114 SUPERSTRUCTURE				1037 MH	12,247	13,600	25,847
261.117	BULKHEAD							
261.1171	STEEL SHEETING			60 TN	600 MH	8,232	21,000	
261.1172	STRUCTURAL STEEL			4 TN	60 MH	782	2,900	
261.1173	GRAVEL FILL							
261.1174	DREDGING			18540 CY	3706 MH	46,276	37,080	
261.1175	RIP-RAP (12 IN. THICK)			185 CY	278 MH	2,768	1,850	
261.1176	CHAIN LINK FENCE(7FT HIGH)			386 LF	116 MH	1,081	2,509	
	261.117 BULKHEAD				4762 MH	59,139	65,339	124,478
261.118	PROTECTIVE DOLPHINS							
261.1181	WOOD PILES			2150 LF	430 MH	5,900	8,600	
	261.118 PROTECTIVE DOLPHINS				430 MH	5,900	8,600	14,500
261.119	BUILDING SERVICES							
261.1191	PLUMBING + DRAINS			5 EA	625 MH	8,099	5,000	
261.1192	HEATING + VENTILATING	1 LT	3,400	1 LT	193 MH	2,494	249	
261.1193	LIGHTING + SERVICE POWER			750 SF	226 MH	2,779	1,350	
	261.119 BUILDING SERVICES		3,400		1044 MH	13,372	6,599	23,371
	261.11 INTAKE STRUCTURE		3,400		67040 MH	764,689	551,403	1,319,492
	261.1 MAKEUP WTR INT + DISCH STR		3,400		67040 MH	764,689	551,403	1,319,492
261.4	CHLORINATION BUILDING							

PLANT CODE 692 | COST BASIS 07/76

COST ESTIMATE - 800 MWe HIGH SULFUR COAL PLANT
ONCE-THROUGH COOLING SYSTEM

03/02/78

ACCT NO.	ACCOUNT DESCRIPTION	FACTORY QUANTITY	FACTORY COSTS	SITE QUANTITY	SITE LABOR HRS	SITE LABOR COST	SITE MATERIAL COST	TOTAL COSTS
261.41	BUILDING STRUCTURE							
261.411	EXCAVATION WORK							
261.4111	EARTH EXCAVATION			53 CY	13 MH	140	53	
261.4114	BACKFILL			41 CY	12 MH	118	41	
	261.411 EXCAVATION WORK				25 MH	258	94	352
261.413	SUBSTRUCTURE CONCRETE							
261.4131	FORMWORK			216 SF	85 MH	938	216	
261.4132	REINF.STEEL			2 TN	51 MH	657	750	
261.4133	CONCRETE			12 CY	9 MH	91	384	
261.4134	EMBEDDED STEEL							
261.4135	FLOOR FINISH			105 SF	1 MH	9	1	
261.4136	WATERPROOFING							
261.4137	CONSTRUCTION JOINTS			50 SF	50 MH	552	50	
261.4138	RUBBING CONCRETE SURFACES							
261.4139	WIRE FABRIC			105 SF	2 MH	27	13	
	261.413 SUBSTRUCTURE CONCRETE				198 MH	2,274	1,414	3,688
261.414	SUPERSTRUCTURE							
261.4141	CONCRETE WORK							
261.4142	STRUCT. + MISC. STEEL							
261.41421	STRUCT. STEEL							
261.41423	MISC. FRAMES, ETC.			2 TN	100 MH	1,302	2,200	

TABLE 2-16

PLANT CODE 692 | COST BASIS 07/76

COST ESTIMATE - 800 MWe HIGH SULFUR COAL PLANT
ONCE-THROUGH COOLING SYSTEM

03/02/78

ACCT NO.	ACCOUNT DESCRIPTION	FACTORY QUANTITY	FACTORY COSTS	SITE QUANTITY	SITE LABOR HRS	SITE LABOR COST	SITE MATERIAL COST	TOTAL COSTS
	261.4142 STRUCT. + MISC. STEEL				100 MH	1,302	2,200	3,502
261.4143	EXTERIOR WALLS							
261.41432	MASONRY			310 SF	73 MH	890	868	
	261.4143 EXTERIOR WALLS				78 MH	890	868	1,758
261.4144	ROOF DECK							
261.41441	METAL ROOF DECK			170 SF	10 MH	131	170	
	261.4144 ROOF DECK				10 MH	131	170	301
261.4145	ROOFING + FLASHING							
261.41451	B.U.ROOFING,FLASHING+INSUL			170 SF	12 MH	162	213	
	261.4145 ROOFING + FLASHING				12 MH	162	213	375
261.4147	DOORS + WINDOWS							
261.41472	PERSONNEL DOORS			50 SF	35 MH	406	600	
261.41473	SASH + GLAZING			25 SF	10 MH	116	300	
	261.4147 DOORS + WINDOWS				45 MH	522	900	1,422
261.4149	PAINTING							
261.41492	STEELWORK			2 TN	10 MH	96	12	
261.41493	METAL DECK			170 SF	5 MH	29	17	
	261.4149 PAINTING				15 MH	125	29	154
	261.414 SUPERSTRUCTURE				258 MH	3,132	4,380	7,512

TABLE 2-16

PLANT CODE 692 | COST BASIS 07/76

COST ESTIMATE - 800 MWe HIGH SULFUR COAL PLANT
ONCE-THROUGH COOLING SYSTEM

03/02/78

ACCT NO.	ACCOUNT DESCRIPTION	FACTORY QUANTITY	FACTORY COSTS	SITE QUANTITY	SITE LABOR HRS	SITE LABOR COST	SITE MATERIAL COST	TOTAL COSTS
	261.41 BUILDING STRUCTURE				481 MH	5,664	5,888	11,552
261.424	LIGHTING + SERVICE POWER							
	261.4 CHLORINATION BUILDING				481 MH	5,664	5,888	11,552
261.5	DISCHARGE TUNNEL + CANAL							
261.51	EXCAVATION							
261.511	EARTH EXCAVATION			16070 CY	4018 MH	43,035	16,070	
261.512	ROCK EXCAVATION			19130 CY	15304 MH	163,912	76,520	
261.514	BACKFILL			8975 CY	2693 MH	28,844	8,975	
261.515	DEWATERING							
	261.51 EXCAVATION				22015 MH	235,791	101,565	337,356
261.53	SUBSTRUCTURE CONCRETE							
261.531	FORMWORK			85550 SF	34220 MH	377,871	85,550	
261.532	REINFORCING STEEL			593 TN	14825 MH	191,438	237,200	
261.533	CONCRETE			7900 CY	5925 MH	60,507	276,500	
261.534	EMBEDDED STEEL							
261.535	FLOOR FINISH							
261.536	WATERPROOFING							
261.537	CONSTRUCTION JOINTS			4690 SF	4690 MH	51,790	4,690	
261.538	RUBBING CONCRETE SURFACES							
	261.53 SUBSTRUCTURE CONCRETE				59660 MH	681,606	603,940	1,285,546
	261.5 DISCHARGE TUNNEL + CANAL				81675 MH	917,397	705,505	1,622,902

TABLE 2-16

PLANT CODE 592 | COST BASIS 07/76 | COST ESTIMATE - 800 MWe HIGH SULFUR COAL PLANT ONCE-THROUGH COOLING SYSTEM | PAGE 8 | 03/02/78

ACCT NO.	ACCOUNT DESCRIPTION	FACTORY QUANTITY	FACTORY COSTS	SITE QUANTITY	SITE LABOR HRS	SITE LABOR COST	SITE MATERIAL COST	TOTAL COSTS
	261. STRUCTURES		3,400		149196 MH	1,687,750	1,262,796	2,953,946
262.	MECHANICAL EQUIPMENT							
262.1	HEAT REJECTION SYSTEM							
262.11	WATER INTAKE EQUIPMENT							
262.111	ROTATING MACHINERY							
262.1111	SCREEN WASH PUMP+MOTOR	2 EA	28,200	1 LT	544 MH	7,190	719	
262.11111	SCREEN WASH PUMP							
262.11112	SCREEN WASH PUMP MOTOR							
	262.1111 SCREEN WASH PUMP+MOTOR		28,200		544 MH	7,190	719	36,109
	262.111 ROTATING MACHINERY		28,200		544 MH	7,190	719	36,109
262.114	PURIFICATION+FILTRATION EQ							
262.1141	TRAVELING SCREENS							
262.11411	CIRCULATING WATER PUMPS	12 EA	604,800	1 LT	19200 MH	243,388	24,839	
262.11412	SCREEN WASH PUMPS	2 EA	60,000	1 LT	600 MH	7,761	776	
	262.1141 TRAVELING SCREENS		664,800		19800 MH	256,149	25,615	946,564
262.1142	TRASH RACK	13 EA	95,030	1 LT	2795 MH	36,383	3,638	
262.1143	TRASH RAKE	1 LT	42,000	1 LT	800 MH	10,350	1,035	
262.1144	STOP LOGS							
262.11441	CIRCULATING WATER PUMPS			276 EA	4140 MH	38,585	8,970	

TABLE 2-16

PLANT CODE 692 | COST BASIS 07/76

COST ESTIMATE - 800 MWe HIGH SULFUR COAL PLANT
ONCE-THROUGH COOLING SYSTEM

03/02/78

ACCT NO.	ACCOUNT DESCRIPTION	FACTORY QUANTITY	FACTORY COSTS	SITE QUANTITY	SITE LABOR HRS	SITE LABOR COST	SITE MATERIAL COST	TOTAL COSTS
262.11442	SCREEN WASH PUMPS			46 EA	460 MH	4,287	828	
	262.1144 STOP LOGS				4600 MH	42,872	9,798	52,670
	262.114 PURIFICATION+FILTRATION EQ		801,830		27995 MH	345,754	40,086	1,187,670
262.115	PIPING-SCREEN WASH							
262.1151	2 IN. + SMALLER							
262.1152	2.5 IN. + LARGER							
262.11521	CS/VNS	20260 LB	30,390	1 LT	3039 MH	39,385	3,939	
	262.1152 2.5 IN. + LARGER		30,390		3039 MH	39,385	3,939	73,714
	262.115 PIPING-SCREEN WASH		30,190		3039 MH	39,385	3,939	73,714
262.116	VALVES-SCREEN WASH	1 LT	22,680					
262.1162	CHECK							
262.1166	BUTTERFLY							
	262.116 VALVES-SCREEN WASH		22,680					22,680
262.117	PIPING-MISC ITEMS							
262.1171	HANGERS + SUPPORTS	3040 LB	4,560					
262.1172	INSULATION							
262.1173	SPECIALTIES							
	262.117 PIPING-MISC ITEMS		4,560					4,560
	262.11 WATER INTAKE EQUIPMENT		887,660		31578 MH	392,329	44,744	1,324,733

TABLE 2-16

PLANT CODE 692 | COST BASIS 07/78 | COST ESTIMATE - 800 MWe HIGH SULFUR COAL PLANT ONCE-THROUGH COOLING SYSTEM | | 03/02/78

ACCT NO.	ACCOUNT DESCRIPTION	FACTORY QUANTITY	FACTORY COSTS	SITE QUANTITY	SITE LABOR HRS	SITE LABOR COST	SITE MATERIAL COST	TOTAL COSTS
262.12	CIRCULATING WATER SYSTEM							
262.121	ROTATING MACHINERY							
262.1211	CIRCULATING WATER PUMP+MTR	6 EA	1,026,000	1 LT	12641 MH	169,717	16,972	
262.12111	CIRC WATER PUMP							
262.12112	CIRC WATER PUMP MOTOR							
262.1211	CIRCULATING WATER PUMP+MTR		1,026,000		12841 MH	169,717	16,972	1,212,689
262.121	ROTATING MACHINERY		1,026,000		12641 MH	169,717	16,972	1,212,689
262.125	PIPE							
262.1251	2 IN + SMALLER							
262.1252	2.5 IN + LARGER							
262.12521	CONCRETE/NNS	722 LF	349,022	1 LT	3503 MH	44,962	4,496	
262.12522	CS/NNS	69162 LB	103,743	1 LT	10374 MH	134,452	13,445	
262.1252	2.5 IN + LARGER		452,765		13882 MH	179,414	17,941	650,120
262.125	PIPE		452,765		13882 MH	179,414	17,941	650,120
262.126	VALVES							
262.1266	BUTTERFLY	10 EA	240,430	1 LT	951 MH	12,322	1,232	
262.126	VALVES		240,430		951 MH	12,322	1,232	253,984
262.127	PIPING / MISC. ITEMS							
262.1271	HANGERS + SUPPORTS							

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PLANT CODE 892 | COST BASIS 07/78

COST ESTIMATE - 800 MWe HIGH SULFUR COAL PLANT
ONCE-THROUGH COOLING SYSTEM

03/02/78

ACCT NO.	ACCOUNT DESCRIPTION	FACTORY QUANTITY	FACTORY COSTS	SITE QUANTITY	SITE LABOR HRS	SITE LABOR COST	SITE MATERIAL COST	TOTAL COSTS
262.1272	INSULATION							
262.1273	SPECIALTIES							
262.12731	EXPANSION JOINTS	1 LT	45,840	1 LT	74 MH	961	96	
	262.1273 SPECIALTIES		45,840		74 MH	961	96	46,897
262.1274	PIPE TRENCHING							
262.12741	EXCAVATION							
262.127411	EARTH EXCAVATION			7506 CY	1877 MH	20,103	7,508	
262.127412	ROCK EXCAVATION			6643 CY	5314 MH	56,914	26,572	
	262.12741 EXCAVATION				7191 MH	77,017	34,080	111,097
262.12742	BACKFILL			8365 CY	2510 MH	24,980	8,365	
262.12743	COMPACTED SAND BED			2537 CY	2587 MH	25,744	15,522	
262.12744	SUBSTRUCTURE CONCRETE							
262.127441	FORMWORK			2000 SF	800 MH	8,834	2,000	
262.127442	REINF STEEL			20 TN	500 MH	6,456	8,000	
262.127443	CONCRETE			265 CY	199 MH	2,032	9,275	
	262.12744 SUBSTRUCTURE CONCRETE				1499 MH	17,322	19,275	36,597
	262.1274 PIPE TRENCHING				13787 MH	145,063	77,242	222,305
	262.127 PIPING / MISC. ITEMS		45,840		13861 MH	146,024	77,338	269,202
262.128	INSTRUMENTATION & CONTROL	1 LT	8,025	1 LT	60 MH	637	37	
262.129	SKIDS / FOUNDATIONS							

TABLE 2-16

PLANT CODE 692 | COST BASIS 07/76

COST ESTIMATE - 800 MWe HIGH SULFUR COAL PLANT
ONCE-THROUGH COOLING SYSTEM

ACCT NO.	ACCOUNT DESCRIPTION	FACTORY QUANTITY	FACTORY COSTS	SITE QUANTITY	SITE LABOR HRS	SITE LABOR COST	SITE MATERIAL COST	TOTAL COSTS
262.1291	CHLORINATION SYSTEM	1 LT	80,000	1 LT	2000 MH	25,874	2,587	
	262.129 SKIDS / FOUNDATIONS		80,000		2000 MH	25,874	2,587	108,461
	262.12 CIRCULATING WATER SYSTEM		1,855,060		43595 MH	534,084	116,107	2,503,251
262.16	DE-ICING SYSTEM							
262.161	ROTATING MACHINERY							
262.1611	DE-ICING PUMPS + MOTORS	2 EA	49,900	1 LT	1120 MH	14,804	1,480	
262.16111	DE-ICING PUMPS							
262.16112	DE-ICING PUMP MOTORS							
	262.1611 DE-ICING PUMPS + MOTORS		49,900		1120 MH	14,804	1,480	66,184
	262.161 ROTATING MACHINERY		49,900		1120 MH	14,804	1,480	66,184
262.165	PIPING							
262.1651	2 IN. + SMALLER							
262.1652	2.5 IN. + LARGER							
262.16521	CONCRETE	680 LF	12,594	1 LT	218 MH	2,793	279	
	262.1652 2.5 IN. + LARGER		12,594		218 MH	2,793	279	15,666
	262.165 PIPING		12,594		218 MH	2,793	279	15,666
262.166	VALVES	2 EA	13,600		71 MH	920		
262.167	EXCAVATION							
262.1671	EARTH EXCAVATION			4003 CY	1001 MH	12,710	4,003	

TABLE 2-16

PLANT CODE 592 | COST BASIS 07/76

COST ESTIMATE - 800 MWe HIGH SULFUR COAL PLANT
ONCE-THROUGH COOLING SYSTEM

03/02/78

ACCT NO.	ACCOUNT DESCRIPTION	FACTORY QUANTITY	FACTORY COSTS	SITE QUANTITY	SITE LABOR HRS	SITE LABOR COST	SITE MATERIAL COST	TOTAL COSTS
262.1672	ROCK EXCAVATION			166 CY	132 MH	1,414	664	
262.1675	BACKFILL			4066 CY	1220 MH	13,068	4,266	
	262.167 EXCAVATION				2352 MH	25,192	8,733	33,925
	262.16 DE-ICING SYSTEM		76,094		4761 MH	43,709	10,492	130,295
	262.1 HEAT REJECTION SYSTEM		2,316,814		76034 MH	970,122	171,343	3,958,279
	262. MECHANICAL EQUIPMENT		2,816,814		76934 MH	970,122	171,343	3,058,279
	26 . MAIN COND HEAT REJECT SYS		2,820,214		228133 MH	2,657,872	1,434,139	6,912,225
	2 . TOTAL DIRECT COSTS		159,795,683		6254063 MH	77,286,324	49,060,361	286,142,368
9 .	TOTAL INDIRECT COSTS							
91 .	TOTAL INDIRECT COSTS	1 LT	35,876,000	1 LT	972000 MH	10,112,500	14,113,000	
	*9 . TOTAL INDIRECT COSTS		35,876,000		972000 MH	10,112,500	14,113,000	60,101,500
	TOTAL BASE COST		175,671,683		7226063 MH	87,398,824	63,173,361	326,243,868

*Detailed Cost Breakdown for Account Number 9., Indirect Costs for Mechanical Wet Towers, is in NUREG-0241 Report.

TABLE 2-17

COST ESTIMATE - 800 MWe HIGH SULFUR COAL PLANT
NATURAL DRAFT COOLING SYSTEM

Account Number		Account Description	Cost Basis 7/76 ------FACTORY------ Quantity	Costs	----------SITE---------- Quantity	Labor Hrs.	Labor Cost	Material Cost	Total Costs
20 .		Land and Land Rights			500 AC			2,000,000	2,000,000
21 .		Structures and Improvements		2,084,775		1196623 MH	14,065,057	21,865,139	38,014,971
22 .		Boiler Plant Equipment		75,728,992		2581618 MH	32,449,814	11,967,198	120,146,004
23 .		Turbine Plant Equipment		49,109,337		1007161 MH	12,835,021	3,268,137	65,182,495
24 .		Electric Plant Equipment*		7,264,381		1046213 MH	12,835,745	7,874,039	27,974,165
25 .		Miscellaneous Plant Equipment		5,188,759		221988 MH	2,842,632	704,962	8,736,353
26 .		Main Condenser Heat Reject System							
261.		Structures		78,213		51157 MH	596,665	556,810	1,231,688
262.		Mechanical Equipment							
262.1		Heat Rejection System							
262.11		Water Intake Equipment							
262.111		Rotating Machinery		2,000		151 MH	1,996	200	
262.114		Purification & Filtration Equip.		125,500		4620 MH	57,899	6,439	
262.115		Piping - Screen Wash		2,730		273 MH	3,539	354	
262.116		Valves - Screen Wash		12,900					
262.117		Piping - Miscellaneous Items		405					
	262.11	Water Intake Equipment		143,535		5044 MH	63,434	6,993	213,962
262.12		Circulating Water System							
262.121		Rotating Machinery		1,395,000		8250 MH	109,040	10,904	
262.125		Pipe		455,299		17254 MH	222,991	22,299	
262.126		Valves		201,250		560 MH	7,258	726	
262.127		Piping - Miscellaneous Items				11860 MH	125,196	65,496	

*Detailed cost summary for this account is found in Table 2-42.

TABLE 2-17

COST ESTIMATE - 800 MWe HIGH SULFUR COAL PLANT
NATURAL DRAFT COOLING SYSTEM

Account Number		Account Description	Cost Basis 7/76 ------FACTORY------ Quantity	Costs	----------SITE---------- Quantity	Labor Hrs.	Labor Cost	Material Cost	Total Costs
262.128		Instrumentation and Control		5,350		45 MH	548	27	
262.129		Skids/Foundations		42,150		1346 MH	17,448	2,492	
	262.12	Circulating Water System		2,099,049		39315 MH	482,481	101,944	2,683,474
262.13		Cooling Towers							
262.132		Heat Transfer Equipment		6,810,000		164700 MH	2,131,218	213,122	
262.138		Instrumentation and Control		36,000		350 MH	4,279	214	
	262.13	Cooling Towers		6,846,000		165050 MH	2,135,497	213,336	9,194,833
262.15		Main Ct. Make-up & Blowdown Sys.							
262.151		Make-up Water System		334,060		9665 MH	104,984	30,798	
262.152		Blowdown System		48,950		351 MH	4,487	439	
262.153		Make-up Water Pretreatment System		613,000		28531 MH	369,103	73,821	
	262.15	Main Ct. Make-up & Blowdn. Sys.		996,010		38547 MH	478,574	105,058	1,579,642
	262.	Mechanical Equipment		10,084,594		247956 MH	3,159,986	427,331	13,671,911
	26 .	Main Cond. Ht. Reject. Sys.		10,162,807		299113 MH	3,756,651	984,141	14,903,599
	2 .	Total Direct Costs		149,539,051		6352716 MH	78,754,920	48,663,616	276,957,587
	*9 .	Total Indirect Costs		36,084,000		972000 MH	10,112,500	14,113,000	60,309,500
		Total Base Cost		185,623,051		7324716 MH	88,867,420	62,776,616	337,267,087

*Detailed Cost Breakdown for Account Number 9., Indirect Costs for Mechanical Wet Towers, is in NUREG-0241 Report.

TABLE 2-18

COST ESTIMATE - 800 MWe HIGH SULFUR COAL PLANT
FAN-ASSISTED NATURAL DRAFT COOLING SYSTEM

Account Number	Account Description	Cost Basis 7/76 ------FACTORY------ Quantity	Costs	----------SITE---------- Quantity	Labor Hrs.	Labor Cost	Material Cost	Total Costs
20 .	Land and Land Rights			500 AC			2,000,000	2,000,000
21 .	Structures and Improvements		2,084,775		1196623 MH	14,065,057	21,865,139	38,014,971
22 .	Boiler Plant Equipment		75,728,992		2581618 MH	32,449,814	11,967,198	120,146,004
23 .	Turbine Plant Equipment		49,109,337		1007161 MH	12,805,021	3,268,137	65,182,495
24 .	Electric Plant Equipment*		7,597,857		1084205 MH	13,302,000	8,163,825	29,063,682
25 .	Miscellaneous Plant Equipment		5,188,759		221988 MH	2,842,632	704,962	8,736,353
26 .	Main Condenser Heat Reject System							
261.	Structures		78,213		51157 MH	596,665	556,810	1,231,688
262.	Mechanical Equipment							
262.1	Heat Rejection System							
262.11	Water Intake Equipment							
262.111	Rotating Machinery		2,000		151 MH	1,996	200	
262.114	Purification & Filtration Equip.		125,500		4620 MH	57,899	6,439	
262.115	Piping - Screen Wash		2,730		273 MH	3,539	354	
262.116	Valves - Screen Wash		12,900					
262.117	Piping - Miscellaneous Items		405					
262.11	Water Intake Equipment		143,535		5044 MH	63,434	6,993	213,962
262.12	Circulating Water System							
262.121	Rotating Machinery		1,347,000		8100 MH	107,057	10,706	
262.125	Pipe		455,299		17254 MH	222,991	22,299	
262.126	Valves		201,250		560 MH	7,258	726	
262.127	Piping - Miscellaneous Items				11860 MH	125,196	65,496	

* Detailed cost summary for this account is found in Table 2-41.

TABLE 2-18

COST ESTIMATE - 800 MWe HIGH SULFUR COAL PLANT
FAN-ASSISTED NATURAL DRAFT COOLING SYSTEM

Account Number		Account Description	Cost Basis 7/76 ------FACTORY------ Quantity	Costs	----------SITE---------- Quantity	Labor Hrs.	Labor Cost	Material Cost	Total Costs
262.128		Instrumentation and Control		5,350		45 MH	548	27	
262.129		Skids/Foundations		42,150		1346 MH	17,448	2,492	
	262.12	Circulating Water System		2,051,049		39165 MH	480,498	101,746	2,633,293
262.13		Cooling Towers							
262.132		Heat Transfer Equipment		4,974,200		84330 MH	1,091,489	109,149	
262.138		Instrumentation and Control		53,950		451 MH	5,514	276	
	262.13	Cooling Towers		5,028,150		84801 MH	1,097,003	109,425	6,234,578
262.15		Main Ct. Make-up & Blowdown Sys.							
262.151		Make-up Water System		334,060		9665 MH	104,984	30,798	
262.152		Blowdown System		48,950		351 MH	4,487	439	
262.153		Make-up Water Pretreatment System		613,000		28531 MH	369,103	73,821	
	262.15	Main Ct. Make-up & Blowdn. Sys.		996,010		38547 MH	478,574	105,058	1,579,642
	262.	Mechanical Equipment		8,218,744		167557 MH	2,119,509	323,222	10,661,475
	26 .	Main Cond. Ht. Reject. Sys.		8,296,957		218714 MH	2,716,174	880,032	11,893,163
	2 .	Total Direct Costs		148,006,677		6301309 MH	78,180,698	48,849,293	275,036,668
	*9 .	Total Indirect Costs		36,006,000		972000 MH	10,112,500	14,113,000	60,231,500
		Total Base Cost		184,012,677		7273309 MH	88,293,198	62,962,293	335,268,168

*Detailed Cost Breakdown for Account Number 9., Indirect Costs for Mechanical Wet Towers, is in NUREG-0241 Report.

TABLE 2-19

DETAILED COST ESTIMATE FOR ACCOUNT 23, TURBINE PLANT EQUIPMENT
1200 MWe PRESSURIZED WATER REACTOR - ONCE THROUGH COOLING SYSTEM

Account Number	Account Description	Cost Basis 7/76 FACTORY Quantity	FACTORY Costs	SITE Quantity	SITE Labor Hours	SITE Labor Cost	SITE Material Cost	Total Costs
23 .	Turbine Plant Equipment							
231.	Turbine Generator		54,874,642		417379 MH	5,194,091	1,287,465	61,356,198
233.	Condensing Systems							
233.1	Condenser Equipment		4,238,084		76233 MH	1,018,197	101,821	5,358,102
233.2	Condensate System		2,488,200		156893 MH	2,004,885	406,057	4,899,142
233.3	Gas Removal System		324,186		8758 MH	113,848	11,512	449,546
233.4	Turbine Bypass System		150,000					150,000
233.5	Condensate Polishing		1,503,520		42102 MH	544,364	54,174	2,102,058
233	Condensing Systems		8,703,990		283986 MH	3,681,294	573,564	12,958,848
234.	Feed Heating System		8,807,502		427569 MH	5,548,535	632,545	14,988,582
235.	Other Turbine Plant Equipment		7,408,466		539642 MH	6,993,950	709,313	15,111,729
236.	Instrumentation and Control		1,134,670		13973 MH	170,805	15,487	1,320,962
237.	Turbine Plant Miscellaneous Items				121481 MH	1,440,145	2,066,426	3,506,571
23	Turbine Plant Equipment		80,929,270		1810?0 MH	23,028,820	5,284,800	109,242,890

TABLE 2-20

DETAILED COST BREAKDOWN OF ACCOUNT 24, ELECTRIC PLANT EQUIPMENT
1200 MWe PRESSURIZED WATER REACTOR - ONCE THROUGH COOLING SYSTEM

Account Number	Account Description	Cost Basis 7/76 FACTORY Quantity	FACTORY Costs	SITE Quantity	SITE Labor Hours	SITE Labor Cost	SITE Material Cost	Total Costs
242.	Station Service Equipment							
242.1	Station Serv&Startup XFMR							
242.11	Unit Auxiliary Transformer		423,987		4728 MH	58,483	5,851	
242.12	Reserve Auxiliary XFMR		816,873		5691 MH	70,401	7,040	
242.13	Foundations for XFMRS				11519 MH	129,586	70,619	
242.1	Station Serv&Startup XFMR		1,240,860		21938 MH	258,470	83,510	1,582,836
242.2	Unit Substations							
242.21	Load Center Switchgear							
242.211	Non-Class 1E Switchgear							
242.2111	Clg Tower+Fire Pump House		27,889		618 MH	7,646	765	
242.2112	Balance of Plant-No CT+FPH		588,001		11126 MH	137,636	13,764	
242.211	Non-Class 1E Switchgear		615,890		11744 MH	145,282	14,529	775,701
242.212	Class 1E Switchgear		445,000		5200 MH	64,328	6,433	
242.21	Load Center Switchgear		1,060,890		16944 MH	209,610	20,962	1,291,462
242.22	Load Center Transformers							
242.221	Non-Class 1E Transformers							
242.2211	Clg Tower+Fire Pump House		11,778		450 MH	5,563	556	
242.2212	Balance of Plant-NO CT+FPH		212,000		8093 MH	100,114	10,011	
242.221	Non-Class 1E Transformers		223,778		8543 MH	105,677	10,567	338,022
242.222	Class 1E Transformers		124,000		3800 MH	47,009	4,701	
242.22	Load Center Transformers		347,778		12343 MH	152,686	15,268	515,732
242.23	Miscellaneous XFMRS		15,000		899 MH	11,123	1,112	
242.2	Unit Substations		1,423,668		30186 MH	373,419	37,342	1,834,429

TABLE 2-20

DETAILED COST BREAKDOWN OF ACCOUNT 24, ELECTRIC PLANT EQUIPMENT
1200 MWe PRESSURIZED WATER REACTOR - ONCE THROUGH COOLING SYSTEM

Cost Basis
7/76

Account Number	Account Description	FACTORY Quantity	FACTORY Costs	SITE Quantity	SITE Labor Hours	SITE Labor Cost	SITE Material Cost	Total Costs
242.3	Auxiliary Power Sources							
242.3	Auxiliary Power Sources		4,018,863		41723 MH	521,329	77,674	4,617,866
242.	Station Service Equipment		6,683,391		93847 MH	1,153,218	198,625	8,035,135
243.	Switchboards							
243.	Switchboards		460,000		10372 MH	128,205	61,093	649,298
244.	Protective Equipment							
244.	Protective Equipment				84003 MH	1,038,088	532,600	1,570,688
245	Elect. Struc + Wiring Contnr							
245.1	Underground Duct Runs							
245.1	Underground Duct Runs				47902 MH	549,724	258,222	807,946
245.2	Cable Tray				213879 MH	2,629,728	1,056,622	
245.3	Conduit				263685 MH	3,242,110	741,702	
245.	Elec.Struc +Wiring Contnr				525466 MH	6,421,562	2,056,546	8,478,108
246.	Power & Control Wiring							
246.1	Generator Circuits Wiring							
246.1	Generator Circuits Wiring		435,050		15368 MH	188,955	18,896	642,901
246.2	Station Service Pwr Wiring							
246.21	High Voltage Bus+Cable							
246.212	Cable							
246.2121	15 kV Cable				7629 MH	93,798	447,595	
246.2123	5 kV Cable				9041 MH	111,162	300,580	
246.212	Cable				16670 MH	204,960	748,175	953,135
246.21	High Voltage Bus+Cable				16670 MH	204,960	748,175	953,135

TABLE 2-20

DETAILED COST BREAKDOWN OF ACCOUNT 24, ELECTRIC PLANT EQUIPMENT
1200 MWe PRESSURIZED WATER REACTOR - ONCE THROUGH COOLING SYSTEM

Cost Basis
7/76

Account Number	Account Description	FACTORY Quantity	FACTORY Costs	SITE Quantity	SITE Labor Hours	SITE Labor Cost	SITE Material Cost	Total Costs
246.22	Low Voltage Bus+Cable							
246.22	Low Voltage Bus+Cable				61314 MH	753,807	313,031	1,066,918
246.2	Station Service				77984 MH	958,847	1,061,206	2,020,053
246.3	Control Cable				248524 MH	3,055,813	2,588,621	
246.4	Instrument Wire				221342 MH	2,721,584	1,405,346	
246.5	Containment Penetrations		506,300		24430 MH	300,007	30,001	
246.	Power & Control Wiring		941,350		587618 MH	7,225,206	5,104,070	13,270,626
24.	Electric Plant Equipment		12,460,450		1364782 MH	16,751,510	8,031,310	37,243,270

TABLE 2-21

DETAILED COST BREAKDOWN FOR ACCOUNT 24, ELECTRIC PLANT EQUIPMENT
1200 MWe PRESSURIZED WATER REACTOR - FAN-ASSISTED NATURAL DRAFT COOLING SYSTEM

Cost Basis
7/76

Account Number	Account Description	FACTORY Quantity	FACTORY Costs	SITE Quantity	SITE Labor Hours	SITE Labor Cost	SITE Material Cost	Total Costs
24.	Electric Plant Equipment							
241.	Switchgear							
241.	Switchgear		4,461,000		64453 MH	797,321	79,684	5,338,005
242.	Station Service Equipment							
242.1	Station Serv&Startup XFMR							
242.1	Station Serv&Startup XFMR		1,472,000		26059 MH	307,014	99,255	1,878,269
242.2	Unit Substations							
242.21	Load Center Switchgear							
242.211	Non-Class 1E Switchgear							
242.2111	CLC Tower+Fire Pump House		334,666		7417 MH	91,755	9,176	
242.2112	Balance of Plant-No CT+FPH		588,001		11126 MH	137,636	13,764	
242.211	Non-Class 1E Switchgear		922,667		18543 MH	229,391	22,940	1,174,998
242.212	Class 1E Switchgear		445,000		5200 MH	64,328	6,433	
242.21	Load Center Switchgear		1,367,667		23743 MH	293,719	29,373	1,690,759
242.22	Load Center Transformers							
242.221	Non-Class 1E Transformers							
242.2211	CLC Tower+Fire Pump House		141,333		5396 MH	66,752	6,675	
242.2212	Balance of Plant-No CT+FPH		212,000		8093 MH	100,114	10,011	
242.221	Non-Class 1E Transformers		353,333		13489 MH	166,866	16,686	536,885
242.222	Class 1E Transformers		124,000		3800 MH	47,009	4,701	
242.22	Load Center Transformers		477,333		17289 MH	213,875	21,387	712,595

TABLE 2-21

DETAILED COST BREAKDOWN FOR ACCOUNT 24, ELECTRIC PLANT EQUIPMENT
1200 MWe PRESSURIZED WATER REACTOR - FAN-ASSISTED NATURAL DRAFT COOLING SYSTEM

Cost Basis
3/76

Account Number		Account Description	FACTORY Quantity	FACTORY Costs	SITE Quantity	SITE Labor Hours	SITE Labor Cost	SITE Material Cost	Total Costs
242.23		Miscellaneous Xfmrs		15,000		899 MH	11,123	1,112	
	242.2	Unit Substations		1,860,000		41931 MH	518,717	51,872	2,430,589
242.3		Auxiliary Power Sources							
	242.3	Auxiliary Power Sources		4,018,863		41723 MH	524,329	77,674	4,617,866
	242.	Station Service Equipment		7,350,863		109713 MH	1,347,060	228,801	8,926,724
243.		Switchboards							
	243.	Switchboards		460,000		10372 MH	128,705	61,093	649,298
244.		Protective Equipment							
	244.	Protective Equipment				84003 MH	1,038,088	532,600	1,570,688
245.		Elect. Struc +Wiring Contnr							
245.1		Underground Duct Runs							
	245.1	Underground Duct Runs				53071 MH	609,061	286,075	895,136
245.2		Cable Tray				225855 MH	2,776,978	1,115,724	
245.3		Conduit				282508 MH	3,473,535	794,554	
	245.	Elect. Struc +Wiring Contnr				561434 MH	6,859,574	2,196,353	9,055,927
246.		Power & Control Wiring							
246.1		Generator Circuits Wiring							
	246.1	Generator Circuits Wiring		435,050		7368 MH	188,955	18,896	642,901
246.2		Station Service PWR Wiring							
246.21		High Voltage Bus+Cable							
	246.21	High Voltage Bus+Cable				17184 MH	211,282	759,187	970,469

TABLE 2-21

DETAILED COST BREAKDOWN FOR ACCOUNT 24, ELECTRIC PLANT EQUIPMENT
1200 MWe PRESSURIZED WATER REACTOR - FAN-ASSISTED NATURAL DRAFT COOLING SYSTEM

Cost Basis
7/76

Account Number		Account Description	FACTORY Quantity	FACTORY Costs	SITE Quantity	SITE Labor Hours	SITE Labor Cost	SITE Material Cost	Total Costs
246.22		Low Voltage Bus+Cable							
	246.22	Low Voltage Bus+Cable				62238 MH	765,240	340,757	1,105,997
	246.2	Station Service PWR Wiring				79422 MH	976,522	1,099,944	2,076,466
246.3		Control Cable				270720 MH	3,328,600	2,819,250	
246.4		Instrument Wire				241110 MH	2,964,533	1,530,857	
246.5		Containment Penetrations		506,300		24400 MH	360,007	30,001	
	246.	Power & Control Wiring		941,350		631020 MH	7,758,617	5,498,948	14,198,915
	24 .	Electric Plant Equipment		13,213,213		1460995 MH	17,928,865	8,597,479	39,739,557

TABLE 2-22

DETAILED COST ESTIMATE FOR ACCOUNT 24, ELECTRIC PLANT EQUIPMENT
1200 MWe PRESSURIZED WATER REACTOR - NATURAL DRAFT COOLING SYSTEM

Cost Basis
7/76

Account Number		Account Description	--------FACTORY-------- Quantity	Costs	----------SITE---------- Quantity	Labor Hours	Labor Cost	Material Cost	Total Costs
24		Electric Plant Equipment							
241.		Switchgear							
241.1		Gen Eqpt Switchgear							
	241.1	Gen Eqpt Switchgear		735,000		8430 MH	104,286	10,380	849,666
241.2		Station Service Switchgear							
241.21		Medium Voltage Metal Clad							
	241.21	Medium Voltage Metal Clad		2,870,000		35341 MH	437,189	43,720	3,350,909
241.22		Station Motor Control Cntr							
241.221		Non-Class 1E 480 V MCC		443,739		10263 MH	126,954	12,695	
241.222		Class 1E 480 V MCC		370,000		9442 MH	116,802	11,680	
	241.22	Station Motor Control Cntr		813,739		19705 MH	243,756	24,375	1,081,870
	241.2	Station Service Switchgear		3,683,739		55046 MH	680,945	68,095	4,432,779
	241.	Switchgear		4,418,739		63476 MH	785,231	78,475	5,282,445
242.		Station Service Equipment							
242.1		Station Serv&Startup XFMR							
242.11		Unit Auxiliary Transformer		481,599		5370 MH	66,433	6,643	
242.12		Reserve Auxiliary XFMR		925,691		6449 MH	72,780	7,978	
242.13		Foundations for Xfmrs							
	242.13	Foundations for Xfmrs				13391 MH	150,641	82,094	232,735
	242.1	Station Serv&Startup XFMR		1,407,290		25210 MH	296,854	96,715	1,800,859
242.2		Unit Substations							

TABLE 2-22

DETAILED COST ESTIMATE FOR ACCOUNT 24, ELECTRIC PLANT EQUIPMENT
1200 MWe PRESSURIZED WATER REACTOR - NATURAL DRAFT COOLING SYSTEM

Cost Basis
7/76

Account Number	Account Description	FACTORY Quantity	FACTORY Costs	SITE Quantity	SITE Labor Hours	SITE Labor Cost	SITE Material Cost	Total Costs
242.21	Load Center Switchgear							
242.211	Non-Class 1E Switchgear							
242.2111	CLG Tower+Fire Pump House		27,889		618 MH	7,646	765	
242.2112	Balance of Plant-No CT+FPH		588,001		11126 MH	137,636	13,764	
242.211	Non-Class 1E Switchgear		615,890		11744 MH	145,282	14,529	775,701
242.212	Class 1E Switchgear		445,000		5200 MH	64,328	6,433	
242.21	Load Center Switchgear		1,060,890		16944 MH	209,610	20,962	1,291,462
242.22	Load Center Transformers							
242.221	Non-Class 1E Transformers							
242.2211	CLG Tower+Fire Pump House		11,778		450 MH	5,563	556	
242.2212	Balance of Plant-No CT+FPH		212,000		8093 MH	100,114	10,011	
242.221	Non-Class 1E Transformers		223,778		8543 MH	105,677	10,567	340,022
242.222	Class 1E Transformers		124,000		3800 MH	47,009	4,701	
242.22	Load Center Transformers		347,778		12343 MH	152,686	15,268	515,732
242.23	Miscellaneous XFMRS		15,000		899 MH	11,123	1,112	
242.2	Unit Substations		1,423,668		30186 MH	373,419	37,342	1,834,429
242.3	Auxiliary Power Sources							
242.3	Auxiliary Power Sources		4,018,863		41723 MH	521,329	77,674	4,617,866
242.	Station Service Equipment		6,849,821		97119 MH	1,191,602	211,731	8,253,154
243.	Switchboards							
243.	Switchboards		460,000		10372 MH	128,205	61,093	649,298

TABLE 2-22

DETAILED COST ESTIMATE FOR ACCOUNT 24, ELECTRIC PLANT EQUIPMENT
1200 MWe PRESSURIZED WATER REACTOR - NATURAL DRAFT COOLING SYSTEM

Cost Basis
7/76

Account Number	Account Description	FACTORY Quantity	FACTORY Costs	SITE Quantity	SITE Labor Hours	SITE Labor Cost	SITE Material Cost	Total Costs
244.	Protective Equipment							
244.	Protective Equipment				84503 MH	1,038,088	532,600	1,570,688
245.	Elect. Struc +Wiring Contnr							
245.1	Underground Duct Runs							
245.1	Underground Duct Runs				47902 MH	549,724	258,222	807,946
245.2	Cable Tray				213879 MH	2,629,728	1,056,622	
245.3	Conduit				263685 MH	3,242,110	741,702	
245.	Elect. Struc +Wiring Contnr				525466 MH	6,421,562	2,056,546	8,478,108
246.	Power & Control Wiring							
246.1	Generator Circuits Wiring							
246.1	Generator Circuits Wiring		435,050		15368 MH	188,955	18,896	642,901
246.2	Station Service PWR Wiring							
246.21	High Voltage Bus+Cable							
246.212	Cable							
246.2121	15 kV Cable				7135 MH	87,732	437,027	
246.2123	5 kV Cable				9041 MH	111,162	300,580	
246.212	Cable				16176 MH	198,894	737,607	936,501
246.21	High Voltage Bus+Cable				16176 MH	198,894	737,607	936,501
246.22	Low Voltage Bus+Cable							
246.22	Low Voltage Bus+Cable				61314 MH	753,887	313,031	1,066,918
246.2	Station Service PWR Wiring				77490 MH	952,781	1,050,638	2,003,419

TABLE 2-22

DETAILED COST ESTIMATE FOR ACCOUNT 24, ELECTRIC PLANT EQUIPMENT
1200 MWe PRESSURIZED WATER REACTOR - NATURAL DRAFT COOLING SYSTEM

Cost Basis
7/76

Account Number	Account Description	FACTORY Quantity	FACTORY Costs	SITE Quantity	SITE Labor Hours	SITE Labor Cost	SITE Material Cost	Total Costs
246.3	Control Cable				248524 MH	3,055,813	2,588,621	
246.4	Instrument Wire				221342 MH	2,721,584	1,405,346	
246.5	Containment Pentrations		506,300		24400 MH	300,007	30,001	
246.	Power & Control Wiring		941,350		587124 MH	7,219,140	5,093,502	13,253,992
24 .	Electric Plant Equipment		12,669,910		1367560 MH	16,783,828	8,033,947	37,487,685

TABLE 2-23

DETAILED COST ESTIMATE FOR ACCOUNT 23, TURBINE PLANT EQUIPMENT
1200 MWe BOILING WATER REACTOR - ONCE-THROUGH COOLING SYSTEM

Cost Basis
7/76

Account Number	Account Description	FACTORY Quantity	FACTORY Costs	SITE Quantity	SITE Labor Hours	SITE Labor Cost	SITE Material Cost	Total Costs
23 .	Turbine Plant Equipment							
231.	Turbine Generator		55,979,726		431726 MH	5,378,099	1,305,285	62,663,110
233.	Condensing Systems							
233.1	Condenser Equipment		4,457,703		79236 MH	1,058,295	105,830	5,621,828
233.2	Condensate System		2,655,749		161029 MH	2,058,542	411,422	5,125,713
233.3	Gas Removal System		308,046		10775 MH	139 ..	14,932	462,896
233.4	Turbine Bypass System		116,880					116,880
233.5	Condensate Polishing		1,303,320		42102 MH	544,304	54,174	2,102,058
233.	Condensing Systems		9,041,898		293142 MH	3,801,119	586,358	13,429,375
234.	Feed Heating System		8,512,838		420022 MH	5,450,218	622,762	14,585,818
235.	Other Turbine Plant Equip.		10,795,728		583717 MH	7,572,086	767,385	19,135,199
236.	Instrumentation & Control		1,142,000		14518 MH	177,465	16,535	1,336,000
237.	Turbine Plant Misc. Items				116269 MH	1,372,743	2,087,235	3,459,978
23 .	Turbine Plant Equipment		85,472,190		1859394 MH	23,751,730	5,385,560	114,609,480

TABLE 2-24

DETAILED COST ESTIMATE FOR ACCOUNT 24, ELECTRIC PLANT EQUIPMENT
1200 MWe BOILING WATER REACTOR - ONCE-THROUGH COOLING SYSTEM

Cost Basis
7/76

Account Number	Account Description	FACTORY Quantity	FACTORY Costs	SITE Quantity	SITE Labor Hours	SITE Labor Cost	SITE Material Cost	Total Costs
24.	Electric Plant Equipment							
241.	Switchgear							
241.1	Gen Eqpt Switchgear							
241.1	Gen Eqpt Switchgear		735,000		8430 MH	104,286	10,380	849,666
241.2	Station Service Switchgear							
241.21	Medium Voltage Metal Clad							
241.211	13.8 kV							
241.211	13.8 kV		667,500		14773 MH	182,750	18,275	1,068,525
241.213	4.16 kV							
241.2131	Non-Class 1E 4.16 kV		717,470		7081 MH	87,597	8,760	
241.2132	Class 1E 4.16 kV		992,400		18208 MH	225,244	22,524	
241.213	4.16 kV		1,709,870		25289 MH	312,841	31,284	2,053,995
241.214	D-G Seq. Logic Pnls		180,000		2022 MH	25,014	2,501	
241.21	Medium Voltage Metal Clad		2,757,770		42084 MH	520,605	52,060	3,330,435
241.22	Station Motor Control Cntr							
241.221	Non-Class 1E 480 V MCC		436,539		10263 MH	126,934	12,695	
241.222	Class 1E 480 V MCC		466,500		9442 MH	116,802	11,680	
241.22	Station Motor Control Cntr		903,039		19705 MH	243,736	24,375	1,171,170
241.2	Station Service Switchgear		3,660,809		61789 MH	764,361	76,435	4,501,605
241.	Switchgear		4,395,809		70219 MH	868,647	86,815	5,351,271
242.	Station Service Equipment							

TABLE 2-24

DETAILED COST ESTIMATE FOR ACCOUNT 24, ELECTRIC PLANT EQUIPMENT
1200 MWe BOILING WATER REACTOR - ONCE-THROUGH COOLING SYSTEM

Cost Basis
7/76

Account Number	Account Description	FACTORY Quantity	FACTORY Costs	SITE Quantity	SITE Labor Hours	SITE Labor Cost	SITE Material Cost	SITE Total Costs
242.1	Station Serv&Startup XFMR							
242.11	Unit Auxiliary Transformer		377,983		4728 MH	58,483	5,845	
242.12	Reserve Auxiliary XFMR		762,873		5691 MH	70,401	7,040	
242.13	Foundations for XFMRS							
242.13	Foundations for XFMRS				11519 MH	129,586	70,619	200,205
242.1	Station Serv&Startup XFMR		1,140,856		21938 MH	258,470	83,504	1,482,830
242.2	Unit Substations							
242.21	Load Center Switchgear							
242.211	Non-Class 1E Switchgear							
242.2111	CLC Tower+Fire Pump House		27,889		618 MH	7,646	765	
242.2112	Balance of Plant-No CT+FPH		425,460		8653 MH	107,043	10,704	
242.211	Non-Class 1E Switchgear		453,349		9271 MH	114,689	11,469	579,507
242.212	Class 1E Switchgear		500,220		5851 MH	72,380	7,238	
242.21	Load Center Switchgear		953,569		15122 MH	187,069	18,707	1,159,345
242.22	Load Center Transformers							
242.221	Non-Class 1E Transformers							
242.2211	CLC Tower+Fire Pump House		11,778		450 MH	5,563	556	
242.2212	Balance of Plant-No CT-FPH		164,889		6294 MH	77,859	7,786	
242.221	Non-Class 1E Transformers		176,667		6744 MH	83,422	8,342	268,431
242.222	Class 1E Transformers		149,256		4275 MH	52,885	5,289	
242.22	Load Center Transformers		325,923		11019 MH	136,307	13,631	475,861

TABLE 2-24

DETAILED COST ESTIMATE FOR ACCOUNT 24, ELECTRIC PLANT EQUIPMENT
1200 MWe BOILING WATER REACTOR - ONCE-THROUGH COOLING SYSTEM

Account Number		Account Description	Cost Basis 7/76 FACTORY Quantity	FACTORY Costs	SITE Quantity	SITE Labor Hours	SITE Labor Cost	SITE Material Cost	Total Costs
242.23		Miscellaneous XFMRS		15,000		899 MH	11,123	1,112	
	242.2	Unit Substations		1,294,492		27040 MH	334,499	33,450	1,662,441
242.3		Auxiliary Power Sources							
	242.3	Auxiliary Power Sources		5,211,543		55007 MH	687,927	104,686	6,004,156
	242.	Station Service Equipment		7,646,891		103985 MH	1,280,896	221,640	9,149,427
243.		Switchboards							
	243.	Switchboards		460,000		10372 MH	128,205	61,093	649,298
244.		Protective Equipment							
	244.	Protective Equipment				63971 MH	1,063,596	545,500	1,609,096
245.		Elect. Struc +Wiring Contr							
245.1		Underground Duct Runs							
	245.1	Underground Duct Runs				48643 MH	558,252	262,299	820,551
245.2		Cable Trav				227479 MH	2,721,944	1,093,672	
245.3		Conduit				223685 MH	2,750,294	629,202	
	245.	Elect. Struc +Wiring Contr				491707 MH	6,030,490	1,985,173	8,015,663
246.		Power & Control Wiring							
246.1		Generator Circuits Wiring							
	246.1	Generator Circuits Wiring		435,050		15368 MH	188,955	18,896	642,901
246.2		Station Service Pwr Wiring							
246.21		High Voltage Bus+Cable							
246.212		Cable							

TABLE 2-24

DETAILED COST ESTIMATE FOR ACCOUNT 24, ELECTRIC PLANT EQUIPMENT
1200 MWe BOILING WATER REACTOR - ONCE-THROUGH COOLING SYSTEM

Cost Basis
7/76

Account Number	Account Description	FACTORY Quantity	FACTORY Costs	SITE Quantity	SITE Labor Hours	SITE Labor Cost	SITE Material Cost	Total Costs
246.7121	15 kV Cable				6272 MH	101,706	240,748	
246.2123	5 kV Cable				12981 MH	159,608	382,930	
246.212	Cable				21253 MH	261,314	673,678	934,992
246.21	High Voltage Bus+Cable				21253 MH	261,314	673,678	934,992
246.22	Low Voltage Bus+Cable							
246.22	Low Voltage Bus+Cable				59580 MH	732,569	312,978	1,045,547
246.2	Station Service Pwr Wiring				80833 MH	993,883	986,636	1,980,519
246.3	Control Cable				200324 MH	3,927,937	2,700,521	
246.4	Instrument Wire				208742 MH	2,566,662	1,325,346	
246.5	Containment Penetrations		456,500		22000 MH	270,499	27,050	
246.	Power & Control Wiring		891,550		613867 MH	7,547,956	5,346,469	13,785,975
24..	Electric Plant Equipment		13,394,250		1376121 MH	16,919,790	8,246,490	38,560,730

TABLE 2-25

DETAILED COST ESTIMATE FOR ACCOUNT 24, ELECTRIC PLANT EQUIPMENT
1200 MWe BOILING WATER REACTOR - FAN-ASSISTED NATURAL DRAFT COOLING SYSTEM

Cost Basis
7/76

Account Number	Account Description	FACTORY Quantity	FACTORY Costs	SITE Quantity	SITE Labor Hours	SITE Labor Cost	SITE Material Cost	Total Costs
24.	Electric Plant Equipment							
241.	Switchgear							
241.	Switchgear		4,381,100		71196 MH	880,737	88,024	5,349,861
242.	Station Service Equipment							
242.1	Station Serv&Startup XFMR							
242.1	Station Serv&Startup XFMR		1,372,000		26059 MH	307,014	99,255	1,778,269
242.2	Unit Substations							
242.21	Load Center Switchgear							
242.211	Non-Class 1E Switchgear							
242.2111	CLC Tower+Fire Pump House		334,666		7417 MH	91,755	9,176	
242.2112	Balance of Plant-No CT+FPH		425,460		8653 MH	107,043	10,704	
242.211	Non-Class 1E Switchgear		760,126		16070 MH	198,798	19,880	978,804
242.212	Class 1E Switchgear		500,720		5851 MH	72,380	7,238	
242.21	Load Center Switchgear		1,260,346		21921 MH	271,178	27,118	1,558,642
242.22	Load Center Transformers							
242.221	Non-Class 1E Transformers							
242.2211	CLC Tower+Fire Pump House		141,333		5396 MH	66,752	6,675	
242.2212	Balance of Plant-No CT+FPH		164,889		6295 MH	77,859	7,786	
242.221	Non-Class 1E Transformers		306,222		11690 MH	144,611	14,461	165,294
242.222	Class 1E Transformers		149,256		4275 MH	52,885	5,289	

TABLE 2-25

DETAILED COST ESTIMATE FOR ACCOUNT 24, ELECTRIC PLANT EQUIPMENT
1200 MWe BOILING WATER REACTOR - FAN-ASSISTED NATURAL DRAFT COOLING SYSTEM

Cost Basis
7/76

			FACTORY		SITE				
Account Number		Account Description	Quantity	Costs	Quantity	Labor Hours	Labor Cost	Material Cost	Total Costs
	242.22	Load Center Transformers		455,478		15965 MH	197,496	19,750	672,724
242.23		Miscellaneous XFMRS		15,000		899 MH	11,123	1,112	
	242.2	Unit Substations		1,730,824		38785 MH	479,797	47,980	2,258,601
242.3		Auxiliary Power Sources							
	242.3	Auxiliary Power Sources		5,211,543		55007 MH	687,927	104,686	6,004,156
	242.	Station Service Equipment		8,314,367		119851 MH	1,474,738	251,921	10,041,026
243.		Switchboards							
	243.	Switchboards		400,000		10372 MH	126,203	61,093	649,296
244.		Protective Equipment							
	244.	Protective Equipment				85971 MH	1,063,596	545,500	1,609,096
245.		Elect. Struc +Wiring Contnr							
245.1		Underground Duct Runs							
	245.1	Underground Duct Runs				53812 MH	617,589	290,152	907,741
245.2		Cable Tray				233355 MH	2,869,194	1,152,774	
245.3		Conduit				242308 MH	2,981,719	682,054	
	245.	Elect. Struc +Wiring Contnr				529675 MH	6,468,502	2,124,980	8,593,482
246.		Power & Control Wiring							
246.1		Generator Circuits Wiring							
	246.1	Generator Circuits Wiring		435,050		15368 MH	188,955	18,896	642,901
246.2		Station Service PWR Wiring							
246.21		High Voltage Bus+Cable							

TABLE 2-25

DETAILED COST ESTIMATE FOR ACCOUNT 24, ELECTRIC PLANT EQUIPMENT
1200 MWe BOILING WATER REACTOR - FAN-ASSISTED NATURAL DRAFT COOLING SYSTEM

Cost Basis
7/76

Account Number		Account Description	FACTORY Quantity	FACTORY Costs	SITE Quantity	SITE Labor Hours	SITE Labor Cost	SITE Material Cost	Total Costs
	246.21	High Voltage Bus+Cable				21767 MH	267,636	684,690	952,326
246.22		Low Voltage Bus+Cable							
	246.22	Low Voltage Bus+Cable				60504 MH	743,922	340,704	1,084,626
	246.2	Station Service Pwr Wiring				82271 MH	1,011,556	1,025,394	2,036,952
246.3		Control Cable				309120 MH	3,800,744	3,219,150	
246.4		Instrument Wire				228510 MH	2,809,611	1,450,857	
246.5		Containment Penetrations		465,500		22000 MH	270,499	27,050	
	246.	Power & Control Wiring		891,550		657269 MH	8,081,367	5,741,347	14,714,264
	24	Electric Plant Equipment		14,147,017		1474334 MH	18,097,145	8,812,865	41,057,027

TABLE 2-26

DETAILED COST ESTIMATE FOR ACCOUNT 24, ELECTRIC PLANT EQUIPMENT
1200 MWe BOILING WATER REACTOR - NATURAL DRAFT COOLING SYSTEM

Account Number	Account Description	Cost Basis 7/76 FACTORY Quantity	FACTORY Costs	SITE Quantity	SITE Labor Hours	SITE Labor Cost	SITE Material Cost	Total Costs
24 .	Electric Plant Equipment							
241.	Switchgear							
241.1	Gen Eqpt Switchgear							
241.1	Gen Eqpt Switchgear		735,000		8430 MH	104,286	10,380	849,666
241.2	Station Service Switchgear							
241.21	Medium Voltage Metal Clad							
241.21	Medium Voltage Metal Clad		2,800,800		42084 MH	520,605	52,060	3,373,465
241.22	Station Motor Control Cntr							
241.221	Non-Class 1E 480 V MCC		436,539		10263 MH	126,954	12,695	
241.222	Class 1E 480 V MCC		466,500		9442 MH	116,802	11,680	
241.22	Station Motor Control Cntr		903,039		19705 MH	243,756	24,375	1,171,170
241.2	Station Service Switchgear		3,703,839		61789 MH	764,361	76,435	4,544,635
241.	Switchgear		4,438,839		7021 MH	868,647	86,815	5,394,301
242.	Station Service Equipment							
242.1	Station Serv&Startup XFMR							
242.11	Unit Auxiliary Transformer		435,599		5370 MH	66,433	6,643	
242.12	Reserve Auxiliary XFMR		671,691		6449 MH	79,780	7,978	
242.13	Foundations for XFMRS							
242.13	Foundations for XFMRS				13391 MH	150,641	82,094	232,735
242.1	Station Serv&Startup XFMR		1,307,290		25210 MH	296,854	96,715	1,700,859
242.2	Unit Substations							

TABLE 2-26

DETAILED COST ESTIMATE FOR ACCOUNT 24, ELECTRIC PLANT EQUIPMENT
1200 MWe BOILING WATER REACTOR - NATURAL DRAFT COOLING SYSTEM

Cost Basis
7/76

Account Number	Account Description	FACTORY Quantity	FACTORY Costs	SITE Quantity	SITE Labor Hours	SITE Labor Cost	SITE Material Cost	Total Costs
242.21	Load Center Switchgear							
242.211	Non-Class 1E Switchgear							
242.2111	CLG Tower+Fire Pump House		27,889		618 MH	7,646	765	
242.2112	Balance of Plant-No CT+FPH		425,460		8653 MH	107,043	10,704	
242.211	Non-Class 1E Switchgear		453,349		9271 MH	114,689	11,469	579,457
242.212	Class 1E Switchgear		500,220		5851 MH	72,380	7,238	
242.21	Load Center Switchgear		953,569		15122 MH	187,069	18,707	1,159,345
242.22	Load Center Transformers							
242.221	Non-Class 1E Transformers							
242.2211	CLG Tower+Fire Pump House		11,778		450 MH	5,563	556	
242.2212	Balance of Plant-No CT+FPH		164,889		6294 MH	77,859	7,786	
242.221	Non-Class 1E Transformers		176,667		6744 MH	83,422	8,342	268,431
242.222	Class 1E Transformers		149,256		4275 MH	52,885	5,289	
242.22	Load Center Transformers		325,923		11019 MH	136,307	13,631	475,861
242.23	Miscellaneous XFMRS		15,000		899 MH	11,123	1,112	
242.2	Unit Substations		1,294,492		27040 MH	334,499	33,450	1,662,441
242.3	Auxiliary Power Sources							

TABLE 2-26

DETAILED COST ESTIMATE FOR ACCOUNT 24, ELECTRIC PLANT EQUIPMENT
1200 MWe BOILING WATER REACTOR - NATURAL DRAFT COO. ·G SYSTEM

Account Number	Account Description	Cost Basis 7/76 FACTORY Quantity	FACTORY Costs	SITE Quantity	SITE Labor Hours	SITE Labor Cost	SITE Material Cost	Total Costs
242.3	Auxiliary Power Sources		5,211,543		55007 MH	687,927	104,686	6,004,156
242.	Station Service Equipment		7,813,325		107257 MH	1,319,280	234,851	9,367,456
243.	Switchboards							
243.	Switchboards		460,000		10372 MH	128,205	61,093	649,298
244.	Protective Equipment							
244.	Protective Equipment				85971 MH	1,063,596	545,500	1,609,096
245.	Elect. Struc +Wiring Contnr							
245.1	Underground Duct Runs							
245.1	Underground Duct Runs				48643 MH	558,252	262,299	820,551
245.2	Cable Tray				221379 MH	2,721,944	1,093,672	
245.3	Conduit				223685 MH	2,750,294	629,202	
245.	Elect. Struc +Wiring Contnr				493707 MH	6,030,490	1,985,173	8,015,663
246.	Power & Control Wiring							
246.1	Generator Circuits Wiring							
246.1	Generator Circuits Wiring		435,050		15368 MH	188,955	18,896	642,901
246.2	Station Service PWR Wiring							
246.21	High Voltage Bus+Cable							
246.212	Cable							
246.2121	15 kV Cable				7778 MH	95,640	280,200	
246.2123	5 kV Cable				12981 MH	159,608	382,910	

TABLE 2-26

DETAILED COST ESTIMATE FOR ACCOUNT 24, ELECTRIC PLANT EQUIPMENT
1200 MWe BOILING WATER REACTOR - NATURAL DRAFT COOLING SYSTEM

Cost Basis
7/76

Account Number		Account Description	FACTORY Quantity	FACTORY Costs	SITE Quantity	SITE Labor Hours	SITE Labor Cost	SITE Material Cost	Total Costs
	246.212	Cable				20759 MH	255,248	663,110	918,358
	246.21	High Voltage Bus+Cable				20759 MH	255,248	663,110	918,358
	246.22	Low Voltage Bus+Cable				59580 MH	732,569	312,978	1,045,547
	246.2	Station Service PWR Wiring				80339 MH	987,817	976,088	1,963,905
246.3		Control Cable				286924 MH	3,527,957	2,988,521	
246.4		Instrument Wire				208742 MH	2,566,662	1,325,346	
246.5		Containment Penetrations		436,500		22000 MH	270,499	27,050	
	246.	Power & Control Wiring		891,550		613373 MH	7,541,890	5,335,901	12,769,341
	24 .	Electric Plant Equipment		13,603,714		1380899 MH	16,952,108	8,249,333	38,805,155

TABLE 2-27

DETAILED COST ESTIMATE FOR ACCOUNT 23, TURBINE PLANT EQUIPMENT
1200 MWe HIGH SULFUR COAL-FIRED PLANT - ONCE-THROUGH COOLING SYSTEM

Cost Basis
7/76

		--------FACTORY--------		----------SITE----------				
Account Number	Account Description	Quantity	Costs	Quantity	Labor Hours	Labor Cost	Material Cost	Total Costs
23 .	Turbine Plant Equipment							
231.	Turbine Generator		45,288,261		339531 MH	4,179,574	1,580,551	51,048,386
233.	Condensing Systems							
233.1	Condenser Equipment		3,263,217		62675 MH	840,791	84,447	4,188,455
233.2	Condensate System		1,453,355		52299 MH	678,263	73,602	2,205,220
233.3	Gas Removal System		368,850		6847 MH	89,211	9,626	467,687
233.5	Condensate Polishing		1,198,52		20430 MH	263,995	26,137	1,488,652
	Condensing Systems		6,283,942		142251 MH	1,872,260	193,812	8,350,014
234.	Feed Heating System		14,310,145		313874 MH	4,071,810	407,590	18,789,545
235.	Other Turbine Plant Equip.		12,035,592		920579 MH	11,930,504	1,213,283	25,179,379
236.	Instrumentation & Control		556,000		5383 MH	65,798	3,290	625,088
237.	Turbine Plant Misc. Items				99451 MH	1,153,314	1,850,104	3,003,418
23 .	Turbine Plant Equipment		78,473,940		1821069 MH	23,273,260	5,248,630	106,995,830

TABLE 2-28

DETAILED COST ESTIMATE FOR ACCOUNT 24, ELECTRIC PLANT EQUIPMENT
1200 MWe HIGH SULFUR COAL-FIRED PLANT - ONCE-THROUGH COOLING SYSTEM

Cost Basis
7/76

Account Number	Account Description	FACTORY Quantity	FACTORY Costs	SITE Quantity	SITE Labor Hours	SITE Labor Cost	SITE Material Cost	SITE Total Costs
24 .	Electric Plant Equipment							
241.	Switchgear							
241.1	Gen Eqpt Switchgear							
241.1	Gen Eqpt Switchgear				7080 MH	87,585	9,635	97,220
241.2	Station Service Switchgear							
241.21	Medium Voltage Metal Clad							
241.211	13.8 kV		1,062,300		12000 MH	148,448	14,845	
241.213	4.16 kV		2,400,000		20000 MH	247,412	24,741	
241.21	Medium Voltage Metal Clad		3,462,300		32000 MH	395,860	39,586	3,897,746
241.22	Station Motor Control Cntr							
241.22	Station Motor Control Cntr		1,125,253		30151 MH	372,986	37,299	1,535,538
241.2	Station Service Switchgear		4,587,553		62151 MH	768,846	76,885	5,433,284
241.	Switchgear		4,587,553		69231 MH	856,431	86,520	5,530,504
242.	Station Service Equipment							
242.1	Station Serv&Startup XFMR							
242.11	Unit Auxiliary Transformer							
242.111	13.8 kV Transformers		314,569		4053 MH	50,139	5,014	
242.112	4.16 kV Transformers		316,000		4000 MH	49,482	4,948	
242.11	Unit Auxiliary Transformer		630,569		8053 MH	99,621	9,962	740,152
242.12	Reserve Auxiliary XFMR							
242.121	13.8 kV Transformer		323,748		2425 MH	29,998	2,997	

TABLE 2-28

DETAILED COST ESTIMATE FOR ACCOUNT 24, ELECTRIC PLANT EQUIPMENT
1200 MWe HIGH SULFUR COAL-FIRED PLANT - ONCE-THROUGH COOLING SYSTEM

Cost Basis
7/76

Account Number	Account Description	FACTORY Quantity	FACTORY Costs	SITE Quantity	SITE Labor Hours	SITE Labor Cost	SITE Material Cost	Total Costs
242.122	4.16 kV Transformer		344,000		2400 MH	29,690	2,969	
242.12	Reserve Auxiliary XFMR		667,748		4825 MH	59,688	5,966	773,402
242.13	Foundations for XFMRS							
242.13	Foundations for XFMRS				7797 MH	88,639	45,343	133,982
242.1	Station Serv&Startup XFMR		1,298,317		20675 MH	247,948	61,271	1,607,536
242.2	Unit Substations							
242.21	Load Center Switchgear							
242.211	General Plant Switchgear							
242.2111	Cooling Tower							
242.2112	Balance of Plant-No CT		864,000		9600 MH	118,758	11,876	
242.211	General Plant Switchgear		864,000		9600 MH	118,758	11,876	994,634
242.212	Precipitator Switchgear		115,000		3500 MH	43,298	4,330	
242.21	Load Center Switchgear		979,000		13100 MH	162,056	16,206	1,157,262
242.22	Load Center Transformers							
242.221	General Plant Ld Ctr XFMRS							
242.2211	Cooling Tower							
242.2212	Balance of Plt 13800-480v		138,000		4800 MH	57,378	5,938	
242.2213	Balance of Plt 4160-480v		132,000		3600 MH	44,534	4,453	
242.221	General Plant Ld Ctr XFMRS		270,000		8400 MH	103,912	10,391	384,303
242.222	Precipitator Ld Ctr XFMRS		204,000		4000 MH	49,482	4,948	
242.22	Load Center Transformers		474,000		12400 MH	153,394	15,339	642,733

TABLE 2-28

DETAILED COST ESTIMATE FOR ACCOUNT 24 - ELECTRIC PLANT EQUIPMENT
1200 MWe HIGH SULFUR COAL-FIRED PLANT - ONCE-THROUGH COOLING SYSTEM

Account Number	Account Description	Cost Basis 7/76	--------FACTORY--------		----------SITE----------				
			Quantity	Costs	Quantity	Labor Hours	Labor Cost	Material Cost	Total Costs
242.23	Miscellaneous XFMRS			15,000		800 MH	9,896	990	
242.2	Unit Substations			1,468,000		26300 MH	325,346	32,535	1,825,881
242.3	Auxiliary Power Sources								
242.3	Auxiliary Power Sources			272,700		4251 MH	53,096	5,309	330,605
242.	Station Service Equipment			3,038,517		51226 MH	626,390	99,115	3,764,022
243.	Switchboards								
243.	Switchboards			518,000		10530 MH	130,167	61,419	709,586
244.	Protective Equipment								
244.	Protective Equipment					85400 MH	1,053,419	671,000	1,724,419
245.	Elect. Struc +Wiring Contnr								
245.1	Underground Duct Runs								
245.1	Underground Duct Runs					63988 MH	748,650	507,020	1,255,670
245.2	Cable Tray					193751 MH	2,382,249	1,148,557	
245.3	Conduit					294961 MH	3,626,721	948,104	
245.	Elect. Struc +Wiring Contnr					552700 MH	6,757,620	2,603,681	9,361,301
246.	Power & Control Wiring								
246.1	Generator Circuits Wiring								
246.1	Generator Circuits Wiring			485,100		16381 MH	201,412	20,141	706,653
246.2	Station Service PWR Wiring								
246.21	High Voltage Bus-Cable								
246.212	Cable								

TABLE 2-28

DETAILED COST ESTIMATE FOR ACCOUNT 24, ELECTRIC PLANT EQUIPMENT
1200 MWe HIGH SULFUR COAL-FIRED PLANT - ONCE-THROUGH COOLING SYSTEM

Account Number	Account Description	Cost Basis 7/76	--------FACTORY--------		----------SITE----------				
			Quantity	Costs	Quantity	Labor Hours	Labor Cost	Material Cost	Total Costs
246.2121	15 kV Cable					8395 MH	103,223	261,065	
246.2123	5 kV Cable					25969 MH	319,298	1,032,864	
246.212	Cable					34364 MH	422,521	1,293,929	1,716,450
246.21	High Voltage Bus+Cable					34364 MH	422,521	1,293,929	1,716,450
246.22	Low Voltage Bus+Cable								
246.22	Low Voltage Bus+Cable					67801 MH	833,649	460,754	1,294,403
246.2	Station Service PWR Wiring					102165 MH	1,256,170	1,754,683	3,010,853
246.3	Control Cable					220080 MH	2,705,787	2,933,719	
246.4	Instrument Wire					94736 MH	1,164,844	688,992	
246.	Power & Control Wiring			485,100		433344 MH	5,328,213	5,397,535	11,210,848
24 .	Electric Plant Equipment			8,629,170		1202431 MH	14,752,249	8,919,270	32,300,680

TABLE 2-29

DETAILED COST ESTIMATE FOR ACCOUNT 24, ELECTRIC PLANT EQUIPMENT
1200 MWe HIGH SULFUR COAL-FIRED PLANT - FAN-ASSISTED NATURAL DRAFT COOLING SYSTEM

Cost Basis
7/76

Account Number		Account Description	FACTORY Quantity	FACTORY Costs	SITE Quantity	SITE Labor Hours	SITE Labor Cost	SITE Material Cost	SITE Total Costs
24.		Electric Plant Equipment							
241.		Switchgear							
	241.	Switchgear		4,626,500		69231 MH	856,431	86,520	5,569,451
242.		Station Service Equipment							
242.1		Station Serv&Startup XFMR							
	242.1	Station Serv&Startup XFMR		1,372,900		22020 MH	263,886	101,084	1,736,970
242.2		Unit Substations							
242.21		Load Center Switchgear							
242.211		General Plant Switchgear							
242.2111		Cooling Tower		280,760		3500 MH	43,298	4,330	
242.2112		Balance of Plant-No Ct		864,000		9600 MH	118,758	11,876	
	242.211	General Plant Switchgear		1,144,760		13100 MH	162,056	16,206	1,323,022
242.212		Precipitator Switchgear		115,000		3500 MH	43,298	4,330	
	242.21	Load Center Switchgear		1,259,760		16600 MH	205,334	20,536	1,485,650
242.22		Load Center Transformers							
242.221		General Plant Ld Ctr XFMRS							
242.2211		Cooling Tower		99,318		4000 MH	49,474	4,948	
242.2212		Balance of Plt 13800-480V		138,000		4800 MH	59,378	5,938	
242.2213		Balance of Plt 4160-480V		132,000		3600 MH	44,534	4,453	
	242.221	General Plant Ld Ctr XFMRS		369,318		12400 MH	153,386	15,339	538,243
242.222		Precipitator Ld Ctr XFMRS		204,000		4000 MH	49,482	4,948	
	242.22	Load Center Transformers		573,318		16400 MH	202,868	20,287	796,473

TABLE 2-29

DETAILED COST ESTIMATE FOR ACCOUNT 24, ELECTRIC PLANT EQUIPMENT
1200 MWe HIGH SULFUR COAL-FIRED PLANT - FAN-ASSISTED NATURAL DRAFT COOLING SYSTEM

Cost Basis
7/76

Account Number		Account Description	FACTORY Quantity	FACTORY Costs	SITE Quantity	SITE Labor Hours	SITE Labor Cost	SITE Material Cost	SITE Total Costs
242.23		Miscellaneous XFMRS		15,000		800 MH	9,896	990	
	242.2	Unit Substations		1,848,278		33830 MH	418,118	41,813	2,308,209
242.3		Auxiliary Power Sources							
	242.3	Auxiliary Power Sources		272,200		4251 MH	53,096	5,309	330,605
	242.*	Station Service Equipment		3,492,478		60071 MH	735,100	148,206	4,375,784
243.		Switchboards							
	243.	Switchboards		518,000		10530 MH	130,167	61,419	709,586
244.		Protective Equipment							
	244.	Protective Equipment				85400 MH	1,053,419	671,000	1,724,419
245.		Elect.Struc +Wiring Contnr							
245.1		Underground Duct Runs							
	245.1	Underground Duct Runs				66552 MH	778,642	527,333	1,305,975
245.2		Cable Tray				201305 MH	2,477,576	1,194,522	
245.3		Conduit				306818 MH	3,772,435	986,200	
	245.	Elec.Struc +Wiring Contnr				574875 MH	7,028,653	2,708,055	9,736,708
246.		Power & Control Wiring							
246.1		Generator Circuits Wiring							
	246.1	Generator Circuits Wiring		485,100		16381 MH	201,412	20,141	706,653
246.2		Station Service Pwr Wiring							
246.21		High Voltage Bus+Cable							
	246.21	High Voltage Bus+Cable				35088 MH	431,419	1,309,428	1,740,847

TABLE 2-29

DETAILED COST ESTIMATE FOR ACCOUNT 24, ELECTRIC PLANT EQUIPMENT
1200 MWe HIGH SULFUR COAL-FIRED PLANT - FAN-ASSISTED NATURAL DRAFT COOLING SYSTEM

Cost Basis
7/76

Account Number		Account Description	FACTORY Quantity	FACTORY Costs	SITE Quantity	SITE Labor Hours	SITE Labor Cost	SITE Material Cost	SITE Total Costs
246.22		Low Voltage Bus+Cable							
	246.22	Low Voltage Bus+Cable				69200 MH	850,839	506,298	1,357,137
	246.2	Station Service Pwr Wiring				104288 MH	1,282,258	1,815,726	3,097,984
246.3		Control Cable				231800 MH	2,850,064	3,089,040	
246.4		Instrument Wire				99772 MH	1,226,734	725,616	
	246.	Power & Control Wiring		485,100		452241 MH	5,560,468	5,650,523	11,696,091
	24.	Electric Plant Equipment		9,122,078		1252348 MH	15,364,238	9,325,723	33,812,039

TABLE 2-30

DETAILED COST ESTIMATE FOR ACCOUNT 24, ELECTRIC PLANT EQUIPMENT
1200 MWe HIGH SULFUR COAL-FIRED PLANT - NATURAL DRAFT COOLING SYSTEM

Cost Basis
7/76

Account Number		Account Description	FACTORY Quantity	FACTORY Costs	SITE Quantity	SITE Labor Hours	SITE Labor Cost	SITE Material Cost	SITE Total Costs
24.		Electric Plant Equipment							
241.		Switchgear							
241.1		Gen Eqpt Switchgear							
	241.1	Gen Eqpt Switchgear				7080 MH	87,585	9,635	97,220
241.2		Station Service Switchgear							
241.21		Medium Voltage Metal Clad							
	241.21	Medium Voltage Metal Clad		3,454,000		32000 MH	395,860	39,586	3,889,446
241.22		Station Motor Control Cntr							
	241.22	Station Motor Control Cntr		1,125,253		30151 MH	372,986	37,299	1,535,538
	241.2	Station Service Switchgear		4,579,253		62151 MH	768,846	76,885	5,424,984
	241.	Switchgear		4,579,253		69231 MH	856,431	86,520	5,522,204
242.		Station Service Equipment							
242.1		Station Serv&Startup XFMR							
242.11		Unit Auxiliary Transformer							
242.111		13.8 kV Transformers		340,983		4377 MH	54,148	5,415	
242.112		4.16 kV Transformers		316,000		4000 MH	49,482	4,948	
	242.11	Unit Auxiliary Transformer		656,983		8377 MH	103,630	10,363	770,976
242.12		Reserve Auxiliary XFMR							
242.121		13.8 kV Transformer		350,677		2624 MH	32,460	3,246	
242.122		4.16 kV Transformer		344,000		2400 MH	29,690	2,969	
	242.12	Reserve Auxiliary XFMR		694,677		5024 MH	62,150	6,215	763,042

TABLE 2-30

DETAILED COST ESTIMATE FOR ACCOUNT 24, ELECTRIC PLANT EQUIPMENT
1200 MWe HIGH SULFUR COAL-FIRED PLANT - NATURAL DRAFT COOLING SYSTEM

Cost Basis
7/76

Account Number	Account Description	FACTORY Quantity	FACTORY Costs	SITE Quantity	SITE Labor Hours	SITE Labor Cost	SITE Material Cost	Total Costs
242.13	Foundations for XFMRS							
242.13	Foundations for XFMRS				8420 MH	95,643	84,260	179,903
242.1	Station Serv&Startup XFMR		1,351,660		21821 MH	261,423	100,838	1,713,921
242.2	Unit Substations							
242.21	Load Center Switchgear							
242.211	General Plant Switchgear							
242.2111	Cooling Tower							
242.2112	Balance of Plant-No CT		864,000		9600 MH	118,758	11,876	
242.211	General Plant Switchgear		864,000		9600 MH	118,758	11,876	994,634
242.212	Precipitator Switchgear		115,000		3500 MH	43,298	4,330	
242.21	Load Center Switchgear		979,000		13100 MH	162,056	16,206	1,157,262
242.22	Load Center Transformers							
242.221	General Plant Ld Ctr XFMRS							
242.2211	Cooling Tower							
242.2212	Balance of Plt 13800-480V		138,000		4800 MH	59,378	5,938	
242.2213	Balance of Plt 4160-480V		132,000		3600 MH	44,534	4,453	
242.221	General Plant Ld Ctr XFMRS		270,000		8400 MH	103,912	10,391	384,303
242.222	Precipitator Ld Ctr XFMRS		204,000		4000 MH	49,482	4,948	
242.22	Load Center Transformers		474,000		12400 MH	153,394	15,339	642,733
242.23	Miscellaneous XFMRS		15,000		800 MH	9,896	990	
242.2	Unit Substations		1,488,000		26300 MH	325,346	32,535	1,825,881

TABLE 2-30

DETAILED COST ESTIMATE FOR ACCOUNT 24, ELECTRIC PLANT EQUIPMENT
1200 MWe HIGH SULFUR COAL-FIRED PLANT - NATURAL DRAFT COOLING SYSTEM

Cost Basis
7/76

Account Number		Account Description	FACTORY Quantity	FACTORY Costs	SITE Quantity	SITE Labor Hours	SITE Labor Cost	SITE Material Cost	Total Costs
242.3		Auxiliary Power Sources							
	242.3	Auxiliary Power Sources		272,200		4251 MH	53,096	5,309	330,605
	242.	Station Service Equipment		3,091,860		52372 MH	639,865	138,682	3,870,407
243.		Switchboards							
	243.	Switchboards		518,000		10530 MH	130,167	61,419	709,586
244.		Protective Equipment							
	244.	Protective Equipment				85400 MH	1,053,419	671,000	1,724,419
245.		Elect.Struc +Wiring Contnr							
245.1		Underground Duct Runs							
	245.1	Underground Duct Runs				63988 MH	748,650	507,020	1,255,670
245.2		Cable Tray				193751 MH	2,382,249	1,148,557	
245.3		Conduit				294961 MH	3,626,721	948,104	
	245.	Elec.Struc +Wiring Contnr				552700 MH	6,757,620	2,603,681	9,361,301
246.		Power & Control Wiring							
246.1		Generator Circuits Wiring							
	246.1	Generator Circuits Wiring		485,100		16381 MH	201,412	20,141	706,653
246.2		Station Service Pwr Wiring							
246.21		High Voltage Bus+Cable							
246.212		Cable							
246.2121		15 kV Cable				7968 MH	97,972	251,919	
246.2123		5 kV Cable				25969 MH	319,298	1,032,864	
	246.212	Cable				33937 MH	417,270	1,284,783	1,702,053
	246.21	High Voltage Bus+Cable				33937 MH	417,270	1,284,783	1,702,053

TABLE 2-30

DETAILED COST ESTIMATE FOR ACCOUNT 24, ELECTRIC PLANT EQUIPMENT
1200 MWe HIGH SULFUR COAL-FIRED PLANT - NATURAL DRAFT COOLING SYSTEM

Cost Basis
7/76

Account Number		Account Description	FACTORY Quantity	FACTORY Costs	SITE Quantity	SITE Labor Hours	SITE Labor Cost	SITE Material Cost	Total Costs
246.22		Low Voltage Bus+Cable							
	246.22	Low Voltage Bus+Cable				67801 MH	833,649	460,754	1,294,403
	246.2	Station Service Pwr Wiring				101738 MH	1,250,919	1,745,537	2,996,456
246.3		Control Cable				220062 MH	2,705,787	2,933,719	
246.4		Instrument Wire				94736 MH	1,164,844	688,992	
	246.	Power & Control Wiring		485,100		432917 MH	5,322,962	5,388,389	11,196,451
	24.	Electric Plant Equipment		8,674,213		1203150 MH	14,760,464	8,949,691	32,384,368

TABLE 2-31

DETAILED COST ESTIMATE FOR ACCOUNT 23, TURBINE PLANT EQUIPMENT
1200 LOW SULFUR COAL-FIRED PLANT - ONCE-THROUGH COOLING SYSTEM

Account Number	Account Description	Cost Basis 7/76 FACTORY Quantity	FACTORY Costs	SITE Quantity	SITE Labor Hours	SITE Labor Cost	SITE Material Cost	Total Costs
23	Turbine Plant Equipment							
231.	Turbine Generator		45,288,261		339531 MH	4,179,574	1,580,551	51,048,386
233.	Condensing System		6,283,942		142251 MH	1,872,260	193,812	8,350,014
234.	Feed Heating System		14,310,145		313874 MH	4,071,810	407,590	18,789,543
235.	Other Turbine Plant Equipment		12,035,592		920579 MH	11,930,504	1,213,283	25,179,379
236.	Instrumentation & Control		556,000		5383 MH	65,798	3,290	625,088
237.	Turbine Plant Misc. Items				99451 MH	1,153,314	1,850,104	3,003,418
23.	Turbine Plant Equipment		78,473,940		1821069 MH	23,273,260	5,248,630	106,995,830

TABLE 2-32

DETAILED SUMMARY OF COSTS FOR ACCOUNT 24, ELECTRIC PLANT EQUIPMENT
1200 MWe LOW SULFUR COAL-FIRED PLANT - ONCE THROUGH COOLING SYSTEM

Cost Basis
7/76

		-------FACTORY--------		----------SITE----------				
Account Number	Account Description	Quantity	Costs	Quantity	Labor Hours	Labor Cost	Material Cost	Total Costs
241.	Switchgear		3,263,853		57380 MH	709,825	71,859	4,045,537
242.	Station Service Equipment		2,832,507		47290 MH	579,100	78,156	3,489,763
243.	Switchboards		518,000		10530 MH	130,167	61,419	709,586
244.	Protective Equipment				77400 MH	955,055	630,000	1,585,055
245.	Elec. Struc. -Wiring Contr				447011 MH	5,465,436	2,105,193	7,570,629
246.	Power & Control Wiring		485,100		361046 MH	4,439,287	4,345,273	9,269,660
24.	Electric Plant Equipment		7,099,460		1000657 MH	12,278,870	7,291,900	26,670,230

TABLE 2-33

DETAILED SUMMARY OF COSTS FOR ACCOUNT 24, ELECTRIC PLANT EQUIPMENT
1200 MWe LOW SULFUR COAL-FIRED PLANT - FAN-ASSISTED NATURAL DRAFT COOLING SYSTEM

Cost Basis
7/76

		-------FACTORY--------		----------SITE----------				
Account Number	Account Description	Quantity	Costs	Quantity	Labor Hours	Labor Cost	Material Cost	Total Costs
241.	Switchgear		3,302,800		57380 MH	709,825	71,859	4,084,484
242.	Station Service Equipment		3,286,478		56135 MH	687,805	127,240	4,101,523
243.	Switchboards		518,006		10530 MH	130,167	61,419	709,586
244.	Protective Equipment				77400 MH	955,055	630,000	1,585,055
245.	Elec.Struc +Wiring Contnr				469186 MH	5,736,469	2,209,567	7,946,036
246.	Power & Control Wiring		485,100		378943 MH	4,671,542	4,598,261	9,754,903
24.	Electric Plant Equipment		7,592,378		1050374 MH	12,890,863	7,698,346	28,181,587

TABLE 2-34

DETAILED SUMMARY OF COSTS FOR ACCOUNT 24, ELECTRIC PLANT EQUIPMENT
1200 MWe LOW SULFUR COAL-FIRED PLANT - NATURAL DRAFT COOLING SYSTEM

Account Number	Account Description	Cost Basis 7/76 FACTORY Quantity	FACTORY Costs	SITE Quantity	SITE Labor Hours	SITE Labor Cost	SITE Material Cost	Total Costs
241.	Switchgear		3,255,553		57380 MH	709,825	71,859	4,037,237
242.	Station Service Equipment		2,885,860		48436 MH	592,570	117,716	3,596,146
243.	Switchboards		518,000		10530 MH	130,167	61,419	709,586
244.	Protective Equipment				77400 MH	955,055	630,000	1,585,055
245.	Elect.Struc +Wiring Contnr				447011 MH	5,465,430	2,105,193	7,570,629
246.	Power & Control Wiring		485,100		360619 MH	4,434,036	4,336,127	8,770,163
24.	Electric Plant Equipment		7,144,513		1001376 MH	12,287,089	7,322,384	26,753,916

TABLE 2-35

DETAILED COST ESTIMATE OF ACCOUNT 23 - TURBINE PLANT EQUIPMENT
800 MWe 1%N SULFUR COAL FIRED PLANT - ONCE-THROUGH COOLING SYSTEM

Cost Basis
7/76

Account Number	Account Description	FACTORY Quantity	FACTORY Costs	SITE Quantity	SITE Labor Hours	SITE Labor Cost	SITE Material Cost	Total Costs
23.	Turbine Plant Equipment							
231.	Turbine Generator		27,729,086		230575 MH	2,846,760	998,776	31,574,622
233.	Condensing Systems							
233.1	Condenser Equipment		2,405,693		51172 MH	683,495	68,354	3,157,542
233.2	Condensate System		944,682		32832 MH	426,194	46,470	1,467,346
233.3	Gas Removal System		230,101		4123 MH	53,678	5,491	289,270
233.5	Condensate Polishing		948,320		19400 MH	250,691	24,824	1,223,835
233	Condensing Systems		4,578,796		107527 MH	1,414,058	145,139	6,137,993
234	Feed Heating System		8,261,530		176356 MH	2,288,392	229,313	10,779,235
235	Other Turbine Plant Equip.		5,609,618		373461 MH	4,839,535	508,048	10,957,201
236	Instrumentation & Control		556,000		5383 MH	65,798	3,290	625,088
237	Turbine Plant Miscellaneous Items				85561 MH	972,467	1,347,774	2,318,241
23	Turbine Plant Equipment		46,735,030		970863 MH	12,427,010	3,230,340	62,392,380

TABLE 2-36

DETAILED COST ESTIMATE OF ACCOUNT 24, ELECTRIC PLANT EQUIPMENT
800 MWe LOW SULFUR COAL-FIRED PLANT - ONCE-THROUGH COOLING SYSTEM

Cost Basis
7/76

Account Number	Account Description	FACTORY Quantity	FACTORY Costs	SITE Quantity	SITE Labor Hours	SITE Labor Cost	SITE Material Cost	Total Costs
24.	Electric Plant Equipment							
241.	Switchgear							
241.1	Gen Eqpt Switchgear							
241.1	Gen Eqpt Switchgear				3540 MH	43,790	4,817	48,607
241.21	Medium Voltage Metal Clad							
241.211	13.8 kV		1,090,053		12000 MH	148,448	14,845	
241.213	4.16 kV		823,500		10500 MH	129,891	12,989	
241.21	Medium Voltage Metal Clad		1,913,553		22500 MH	278,339	27,834	2,219,726
241.22	Station Motor Control Cntr							
242.22	Station Motor Control Cntr		786,458		21600 MH	267,204	26,720	1,082,382
241.2	Station Service Switchgear		2,702,011		44100 MH	545,543	54,554	3,302,108
241.	Switchgear		2,702,011		47640 MH	589,333	59,371	3,350,715
242.	Station Service Equipment							
242.1	Station Serv&Startup XFMR							
242.11	Unit Auxiliary Transformer							
242.111	13.8 kV Transformers		266,341		3620 MH	44,749	4,636	
242.112	4.16 kV Transformer (3W)		117,000		1600 MH	19,792	1,979	
242.113	4.16 kV Transformer (2W)		88,000		1300 MH	16,083	1,608	
242.11	Unit Auxiliary Transformer		471,341		6520 MH	80,635	8,223	560,199
242.12	Reserve Auxiliary XFMR							
242.121	13.8 kV Transformer		279,483		1980 MH	24,470	2,586	
242.122	4.16 kV Transformer		296,000		1900 MH	23,504	2,350	
242.12	Reserve Auxiliary XFMR		575,483		3880 MH	47,974	4,936	628,393

TABLE 2-36

DETAILED COST ESTIMATE OF ACCOUNT 24, ELECTRIC PLANT EQUIPMENT
800 MWe LOW SULFUR COAL-FIRED PLANT - ONCE-THROUGH COOLING SYSTEM

Cost basis
7/76

Account Number	Account Description	-------FACTORY------- Quantity	Costs	----------SITE---------- Quantity	Labor Hours	Labor Cost	Material Cost	Total Costs
242.13	Foundations for XFMRS							
242.13	Foundations for XFMRS				5183 MH	58,969	22,187	
242.1	Station Serv&Startup XFMR		1,046,824		15583 MH	187,578	35,346	1,269,748
242.2	Unit Substations							
242.21	Load Center Switchgear							
242.211	General Plant Switchgear							
242.2111	Cooling Tower							
242.2112	Balance of Plant-No Ct		660,000		8000 MH	98,964	9,896	
242.211	General Plant Switchgear		660,000		8000 MH	98,964	9,896	768,060
242.212	Precipitator Switchgear		69,000		2100 MH	25,979	2,598	
242.21	Load Center Switchgear		729,000		10100 MH	124,943	12,494	866,437
242.22	Load Center Transformers							
242.221	General Plant Ld Ctr XFMRS							
242.2211	Cooling Tower							
242.2212	Balance of Plt 13800-480V		149,500		5200 MH	64,328	6,433	
242.2213	Balance of Plt 4160-480V		73,500		2100 MH	25,979	2,598	
242.221	General Plant Ld Ctr XFMRS		223,000		7300 MH	90,307	9,031	322,338
242.222	Precipitator Ld Ctr XFMRS		122,400		2400 MH	29,690	2,969	
242.22	Load Center Transformers		345,400		9700 MH	119,997	12,000	477,397
242.23	Miscellaneous XFMRS		15,000		800 MH	9,896	990	
242.2	Unit Substations		1,089,400		20600 MH	254,836	25,484	1,369,720

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TABLE 2-36

DETAILED COST ESTIMATE OF ACCOUNT 24, ELECTRIC PLANT EQUIPMENT
800 MWe LOW SULFUR COAL-FIRED PLANT - ONCE-THROUGH COOLING SYSTEM

Cost Basis
7/76

Account Number		Account Description	FACTORY Quantity	FACTORY Costs	SITE Quantity	SITE Labor Hours	SITE Labor Cost	SITE Material Cost	Total Costs
242.3		Auxiliary Power Sources							
	242.3	Auxiliary Power Sources		227,400		4051 MH	50,621	5,061	283,082
	242.	Station Service Equipment		2,363,624		40234 MH	493,035	65,891	2,922,550
243.		Switchboards							
	243.	Switchboards		428,000		9030 MH	111,609	59,563	599,172
244.		Protective Equipment							
	244.	Protective Equipment				72400 MH	893,578	598,000	1,491,578
245.		Elect.Struc +Wiring Contnr							
245.1		Underground Duct Runs							
	245.1	Underground Duct Runs				48972 MH	572,866	389,517	962,383
245.2		Cable Tray				146776 MH	1,804,620	872,030	
245.3		Conduit				225690 MH	2,774,903	727,062	
	245.	Elect.Struc +Wiring Contnr				421438 MH	5,152,389	1,988,609	7,140,998
246.		Power & Control Wiring							
246.1		Generator Circuits Wiring							
	246.1	Generator Circuits Wiring		429,275		14495 MH	178,222	17,822	625,319
246.2		Station Service Pwr Wiring							
246.21		High Voltage Bus+Cable							
246.212		Cable							
246.2121		15 kV Cable				9232 MH	113,499	309,984	
246.2123		5 kV Cable				19950 MH	245,294	900,600	

TABLE 2-36

DETAILED COST ESTIMATE OF ACCOUNT 24, ELECTRIC PLANT EQUIPMENT
800 MWe LOW SULFUR COAL-FIRED PLANT - ONCE-THROUGH COOLING SYSTEM

Account Number	Account Description	Cost Basis 7/76	-------FACTORY-------		----------SITE----------				
			Quantity	Costs	Quantity	Labor Hours	Labor Cost	Material Cost	Total Costs
246.212	Cable					29182 MH	358,793	1,210,584	1,569,377
246.21	High Voltage Bus+Cable					29182 MH	358,793	1,210,584	1,569,377
246.22	Low Voltage Bus+Cable								
246.22	Low Voltage Bus+Cable					48680 MH	598,541	354,705	953,246
246.2	Station Service Pwr Wiring					77862 MH	957,334	1,565,289	2,522,623
246.3	Control Cable					152961 MH	1,880,674	2,044,528	
246.4	Instrument Wire					65722 MH	808,066	479,237	
246.	Power & Control Wiring			429,275		311040 MH	3,824,296	4,106,876	8,360,447
24.	Electric Plant Equipment			5,922,910		901782 MH	11,064,240	6,878,310	23,865,460

TABLE 2-37

DETAILED COST ESTIMATE OF ACCOUNT 24, ELECTRIC PLANT EQUIPMENT
800 MWe LOW SULFUR COAL-FIRED PLANT - FAN-ASSISTED NATURAL DRAFT COOLING SYSTEM

Cost Basis
7/76

Account Number	Account Description	-------FACTORY-------- Quantity	Costs	----------SITE---------- Quantity	Labor Hours	Labor Cost	Material Cost	Total Costs
24.	Electric Plant Equipment							
241.	Switchgear							
241.	Switchgear		2,744,500		47640 MH	589,333	59,371	3,393,204
242.	Station Service Equipment							
242.1	Station Serv&Startup XFMR							
242.1	Station Serv&Startup XFMR		1,142,000		17294 MH	208,105	72,392	1,422,497
242.2	Unit Substations							
242.21	Load Center Switchgear							
242.211	General Plant Switchgear							
242.2111	Cooling Tower		175,282		1610 MH	19,923	1,921	
242.2112	Balance of Plant-No Ct		660,000		8000 MH	98,964	9,896	
242.211	General Plant Switchgear		835,282		9610 MH	118,887	11,817	965,986
242.212	Precipitator Switchgear		69,000		2100 MH	25,979	2,598	
242.21	Load Center Switchgear		904,282		11710 MH	144,866	14,415	1,063,563
242.22	Load Center Transformers							
242.22	Load Center Transformers		392,400		11300 MH	139,789	13,979	546,168
242.23	Miscellaneous XFMRS		15,000		800 MH	9,896	990	
242.2	Unit Substations		1,311,682		23810 MH	294,551	29,384	1,635,617
242.3	Auxiliary Power Sources							
242.31	Auxiliary Power Sources		227,400		4051 MH	50,621	5,061	283,082
242.	Station Service Equipment		2,681,082		45155 MH	553,277	106,837	3,341,196
243.	Switchboards							
243.	Switchboards		428,000		9030 MH	111,609	59,563	599,172

TABLE 2-37

DETAILED COST ESTIMATE OF ACCOUNT 24, ELECTRIC PLANT EQUIPMENT
800 MWe LOW SULFUR COAL-FIRED PLANT - FAN-ASSISTED NATURAL DRAFT COOLING SYSTEM

Cost Basis
7/76

Account Number		Account Description	FACTORY Quantity	FACTORY Costs	SITE Quantity	SITE Labor Hours	SITE Labor Cost	SITE Material Cost	Total Costs
244.		Protective Equipment							
	244.	Protective Equipment				72400 MH	893,578	598,000	1,491,578
245.		Elec.Struc +Wiring Contnr							
245.1		Underground Duct Runs							
	245.1	Underground Duct Runs				51145 MH	598,314	405,293	1,003,607
245.2		Cable Tray				[illegible]303 MH	1,884,934	907,475	
245.3		Conduit				235741 MH	2,898,539	756,645	
	245.	Elect.Struc +Wiring Contnr				440189 MH	5,381,787	2,069,413	7,451,200
246.		Power & Control Wiring							
246.1		Generator Circuits Wiring							
	246.1	Generator Circuits Wiring		429,275		14495 MH	178,222	17,822	625,319
246.2		Station Service Pwr [illegible]ing							
246.21		High Voltage Bus+Cable							
	246.21	High Voltage Bus+Cable				29950 MH	368,248	1,226,100	1,594,348
246.22		Low Voltage Bus+Cable							
	246.22	Low Voltage Bus+Cable				50304 MH	620,965	405,268	1,026,233
	246.2	Station Service Pwr Wiring				80454 MH	989,213	1,631,368	2,620,581
246.3		Control Cable				160722 MH	1,976,143	2,139,533	
246.4		Instrument Wire				69061 MH	849,132	501,640	
	246.	Power & Control Wiring		429,275		324732 MH	3,992,710	4,290,363	8,712,348
	24.	Electric Plant Equipment		6,282,857		939146 MH	11,522,294	7,183,547	24,988,698

TABLE 2-38

DETAILED COST ESTIMATE FOR ACCOUNT 24, ELECTRIC PLANT EQUIPMENT
800 MWe LOW SULFUR COAL-FIRED PLANT - NATURAL DRAFT COOLING SYSTEM

Cost Basis
7/76

Account Number		Account Description	FACTORY Quantity	FACTORY Costs	SITE Quantity	SITE Labor Hours	SITE Labor Cost	SITE Material Cost	Total Costs
24.		Electric Plant Equipment							
241.		Switchgear							
241.1		Gen Eqpt Switchgear							
	241.	Gen Eqpt Switchgear				3540 MH	43,790	4,817	48,607
241.2		Station Service Switchgear							
241.21		Medium Voltage Metal Clad							
	241.21	Medium Voltage Metal Clad		1,904,500		22500 MH	278,339	27,834	2,210,673
241.22		Station Motor Control Cntr							
	241.22	Station Motor Control Cntr		787,399		21600 MH	267,204	26,720	1,081,323
	241.2	Station Service Switchgear		2,691,899		44100 MH	545,543	54,554	3,291,996
	241.	Switchgear		2,691,899		47640 MH	589,333	59,371	3,340,603
242.		Station Service Equipment							
242.1		Station Serv&Startup XFMR							
242.11		Unit Auxiliary Transformer							
242.111		13.8 kV Transformers		284,971		3756 MH	46,457	4,747	
242.112		4.16 kV Transformer (3W)		117,000		1600 MH	19,792	1,979	
242.113		4.16 kV Transformer (2W)		88,000		1300 MH	16,083	1,608	
	242.11	Unit Auxiliary Transformer		489,971		6656 MH	82,332	8,334	580,637
242.12		Reserve Auxiliary XFMR							
242.121		13.8 kV Transformer		297,436		2046 MH	25,291	2,621	
242.122		4.16 kV Transformer		296,000		1900 MH	23,504	2,350	
	242.12	Reserve Auxiliary XFMR		593,436		3946 MH	48,795	4,971	647,202

TABLE 2-38

DETAILED COST ESTIMATE FOR ACCOUNT 24, ELECTRIC PLANT EQUIPMENT
800 MWe LOW SULFUR COAL-FIRED PLANT - NATURAL DRAFT COOLING SYSTEM

Account Number		Account Description	Cost Basis 7/76 FACTORY Quantity	FACTORY Costs	SITE Quantity	SITE Labor Hours	SITE Labor Cost	SITE Material Cost	Total Costs
242.13	Found	Foundations for XFMRS							
	242.13	Foundations for XFMRS				5794 MH	65,842	58,166	124,008
	242.1	Station Serv&Startup XFMR		1,083,407		16396 MH	196,969	71,471	1,351,847
242.2		Unit Substations							
242.21		Load Center Switchgear							
242.211		General Plant Switchgear							
242.2111		Cooling Tower							
242.2112		Balance of Plant-No Ct		660,000		8000 MH	98,964	9,896	
	242.211	General Plant Switchgear		660,000		8000 MH	98,964	9,896	768,860
242.212		Precipitator Switchgear		69,000		2100 MH	25,979	2,598	
	242.21	Load Center Switchgear		729,000		10100 MH	124,943	12,494	866,437
242.22		Load Center Transformers							
242.221		General Plant Ld Ctr XFMRS							
242.2211		Cooling Tower							
242.2212		Balance of Plt 13800-480V		149,500		5200 MH	64,328	6,433	
242.2213		Balance of Plt 4160-480V		73,500		2100 MH	25,979	2,598	
	242.221	General Plant Ld Ctr XFMRS		223,000		7300 MH	90,307	9,031	322,338
242.222		Precipitator Ld Ctr XFMRS		122,400		2400 MH	29,690	2,969	
	242.22	Load Center Transformers		345,400		9700 MH	119,997	12,000	477,397
242.23		Miscellaneous XFMRS		15,000		800 MH	9,896	990	
	242.2	Unit Substations		1,089,400		20600 MH	254,836	25,484	1,369,720

TABLE 2-38

DETAILED COST ESTIMATE FOR ACCOUNT 24, ELECTRIC PLANT EQUIPMENT
800 MWe LOW SULFUR COAL-FIRED PLANT - NATURAL DRAFT COOLING SYSTEM

Cost Basis
7/76

Account Number		Account Description	FACTORY Quantity	FACTORY Costs	SITE Quantity	SITE Labor Hours	SITE Labor Cost	SITE Material Cost	Total Costs
242.3		Auxiliary Power Sources							
	242.3	Auxiliary Power Sources		227,400		4051 MH	50,621	5,061	283,082
	242.	Station Service Equipment		2,400,207		41047 MH	502,426	102,016	3,004,649
243.		Switchboards							
	243.	Switchboards		428,000		9030 MH	111,609	59,563	599,172
244.		Protective Equipment							
	244.	Protective Equipment				72400 MH	893,578	598,000	1,491,578
245.		Elec.Struc +Wiring Contnr							
245.1		Underground Duct Runs							
	245.1	Underground Duct Runs				48899 MH	572,023	388,695	960,718
245.2		Cable Tray				146558 MH	1,801,956	870,181	
245.3		Conduit				225355 MH	2,770,802	725,518	
	245.	Elec Struc +Wiring Contnr				420812 MH	5,144,781	1,984,394	7,129,175
246.		Power & Control Wiring							
246.1		Generator Circuits Wiring							
	246.1	Generator Circuits Wiring		429,275		14495 MH	178,222	17,822	625,319
246.2		Station Service Pwr Wiring							
246.21		High Voltage Bus+Cable							
246.212		Cable							
246.2121		15 kV Cable				8852 MH	108,833	301,883	
246.2123		5 kV Cable				19930 MH	245,294	900,600	

TABLE 2-38

DETAILED COST ESTIMATE FOR ACCOUNT 24, ELECTRIC PLANT EQUIPMENT
800 MWe LOW SULFUR COAL-FIRED PLANT - NATURAL DRAFT COOLING SYSTEM

Cost Basis
7/76

Account Number	Account Description	-------FACTORY-------- Quantity	Costs	---------- TE---------- Quantity	Labor Hours	Labor Cost	Material Cost	Total Costs
246.212	Cable				28802 MH	354,127	1,202,483	1,556,610
246.21	High Voltage Bus+Cable				28802 MH	354,127	1,202,483	1,556,610
246.22	Low Voltage Bus+Cable							
246.22.	Low Voltage Bus+Cable				48628 MH	597,908	352,648	950,556
246.2	Station Service Pwr Wiring				77430 MH	952,035	1,555,131	2,507,166
246.3	Control Cable				152693 MH	1,877,398	2,039,426	
246.4	Instrument Wire				65607 MH	806,657	478,038	
246.	Power & Control Wiring		429,275		310225 MH	3,814,312	4,090,417	8,334,004
24.	Electric Plant Equipment		5,949,381		901154 MH	11,056,039	6,893,761	23,899,181

TABLE 2-39

DETAILED COST ESTIMATE FOR ACCOUNT 23, TURBINE PLANT EQUIPMENT
800 HIGH SULFUR COAL-FIRED PLANT - ONCE-THROUGH COOLING SYSTEM

Account Number	Account Description	Cost Basis 7776 FACTORY Quantity	FACTORY Costs	SITE Quantity	SITE Labor Hours	SITE Labor Cost	SITE Material Cost	Total Costs
23.	Turbine Plant Equipment							
231.	Turbine Generator		27,729,086		230575 MH	2,846,760	998,776	31,574,622
233.	Condensing System		4,578,796		107527 MH	1,414,058	145,139	
234.	Feed Heating System		8,261,530		176356 MH	2,288,392	229,313	10,779,235
235.	Other Turbine Plant Equipment		5,609,618		373461 MH	4,839,535	508,048	10,957,201
236.	Instrumentation & Control		556,000		5383 MH	65,798	3,290	625,088
237.	Turbine Plant Misc. Items				85561 MH	972,467	1,345,774	2,318,241
23.	Turbine Plant Equipment		48,735,030		978863 MH	11,427,010	3,230,340	62,392,380

TABLE 2-40

DETAILED SUMMARY OF COSTS FOR ACCOUNT 24, ELECTRIC PLANT EQUIPMENT
800 MWe HIGH SULFUR COAL-FIRED PLANT - ONCE THROUGH COOLING SYSTEM

Cost Basis
7/76

		FACTORY		SITE				
Account Number	Account Description	Quantity	Costs	Quantity	Labor Hours	Labor Cost	Material Cost	Total Costs
241.	Switchgear		3,750,511		58640 MH	725,412	72,980	4,548,903
242.	Station Service Equipment		2,630,124		44776 MH	548,591	77,067	3,255,782
243.	Switchboards		428,000		9030 MH	111,609	59,563	599,172
244.	Protective Equipment				76400 MH	942,760	622,000	1,564,760
245.	Elect.Struc +Wiring Contnr				484270 MH	5,920,533	2,285,089	8,205,622
246.	Power & Control Wiring		429,275		373725 MH	4,595,035	4,741,881	9,766,191
24.	Electric Plant Equipment		7,237,910		1046841 MH	12,843,940	7,858,580	27,940,430

TABLE 2-41

DETAILED SUMMARY OF COSTS FOR ACCOUNT 24, ELECTRIC PLANT EQUIPMENT
800 MWe HIGH SULFUR COAL-FIRED PLANT - FAN-ASSISTED NATURAL DRAFT COOLING SYSTEM

Cost Basis
7/76

		-------FACTORY--------		----------SITE----------				
Account Number	Account Description	Quantity	Costs	Quantity	Labor Hours	Labor Cost	Material Cost	Total Costs
241.	Switchgear		3,793,000		58640 MH	725,412	72,980	4,591,392
242.	Station Service Equipment		2,947,582		49697 MH	608,839	118,021	3,674,442
243.	Switchboards		428,000		9030 MH	111,609	59,563	599,172
244.	Protective Equipment				76400 MH	942,760	622,000	1,564,760
245.	Elec.Struc +Wiring Conter				503021 MH	6,149,931	2,365,893	8,515,824
246.	Power & Control Wiring		429,275		387417 MH	4,763,445	4,925,368	10,118,092
24.	Electric Plant Equipment		7,597,857		1084205 MH	13,302,000	8,163,825	29,063,682

TABLE 2-42

DETAILED SUMMARY OF COSTS FOR ACCOUNT 24, ELECTRIC PLANT EQUIPMENT
800 MWe HIGH SULFUR COAL-FIRED PLANT - NATURAL DRAFT COOLING SYSTEM

Cost Basis
7/76

		FACTORY		SITE				
Account Number	Account Description	Quantity	Costs	Quantity	Labor Hours	Labor Cost	Material Cost	Total Costs
241.	Switchgear		3,740,399		58640 MH	725,412	72,980	4,538,791
242.	Station Service Equipment		2,666,707		45589 MH	557,983	113,200	3,337,895
243.	Switchboards		428,000		9030 MH	111,609	59,563	599,172
244.	Protective Equipment				76400 MH	942,760	622,000	1,564,760
245.	Elec.Struc +Wiring				483644 MH	5,912,925	2,280,874	8,193,799
246.	Power & Control Wiring		429,275		372910 MH	4,585,051	4,725,422	9,739,748
24.	Electric Plant Equipment		7,264,381		1046213 MH	12,835,745	7,874,039	27,974,165

2.9 REFERENCES FOR CAPITAL COST STUDIES

Reference No.	Report Title and Number
1	Capital Cost: Pressurized Water Reactor Plant (NUREG-0241, COO-2477-5)
2	Capital Cost: Boiling Water Reactor Plant (NUREG-0242, COO-2477-6)
3	Capital Cost: High and Low Sulfur Coal-Fired Plants - 1200 MWe (NUREG-0243, COO-2477-7)
4	Capital Cost: Low and High Sulfur Coal-Fired Plants - 800 MWe (NUREG-0244, COO-2477-8)
5	Total Generating Generating Costs: Coal and Nuclear Plants (NUREG-0248, COO-2477-12)

SECTION 3

TOTAL GENERATING COSTS

SECTION 3.0

TOTAL GENERATING COSTS

3.1 INTRODUCTION

Data presented in these studies can be used in conjunction with those given in Reference 5 to develop the total generating costs for plants incorporating the alternate cooling systems. Tables 3-1 through 3-6 present pertinent cost and plant operational data for the alternate cooling systems.

The total generating cost is composed of the following components: Capital cost, mills/kWh; fuel cost, mills/kWh; and operating and maintenance (O&M) cost, mills/kWh. The capital cost of alternate cooling systems affects the capital cost component of total generating cost directly. Fuel cost and O&M cost components are influenced by the yearly total energy produced by the turbine as affected by the alternate cooling systems. Although the same design points are used for each system, the total energy produced by each alternate system is affected by the operating differences at off-design, ambient temperatures.

Multipliers for adjusting the capital cost, fuel cost and O&M cost from the plant with the base mechanical wet tower cooling system, are presented for the three alternate cooling systems of all six plants studied. These multipliers are used with the capital, fuel, and O&M costs, of the generating costs presented in Reference 5.

3.2 EXAMPLE

The following is an example illustrating the use of the capital cost multipliers given in Tables 3-1 thru 3-6, to adjust the total generating cost as alternate cooling systems are used. This specific example uses the base generating cost data given in Reference 5 for a single unit PWR plant with a 1985 year of operation and 70 percent capacity factor.

	Mechanical Draft Towers		Multiplier		Once-through Cooling
Capital Cost, mills/kWh	31.2	x	0.957	=	29.9
Fuel Cost, mills/kWh	12.6	x	0.981	=	12.4
Operating and Maintenance Cost, mills/kWh	2.8	x	0.981	=	2.7
Total Generating	46.6				45.0

Accordingly, the generating cost for the PWR plant changes from 46.6 mills/kWh to 45.0 mills/kWh when the cooling system is changed from the base mechanical draft cooling system to a once-through cooling system. Similar calculations can be completed for the varying capacity factors and plant operation dates presented in the Total Generating Cost studies, (NUREG-0248, COO-2477-12).

TABLE 3-1

TOTAL GENERATING COSTS - 1200 MWe PRESSURIZED WATER REACTOR

	Base Case(1)	Once-Through	Natural Draft	Fan-Assisted Natural Draft
Total Base Construction Cost, 10^6	568.8	554.9	569.7	569.2
Generator Output at Average Yearly Ambient, MWe(2)	1193	1203	1201	1195
Auxiliary Requirements, MWe	54	42	52	55
Net Power to Transformers, MWe	1139	1161	1149	1140
Capital Cost Multiplier	Base	0.957	0.993	1.000
Fuel Cost Multiplier	Base	0.981	0.991	0.999
Operating and Maintenance Multiplier	Base	0.981	0.991	0.999

(1) Mechanical Draft Evaporative Towers
(2) The Annual Average Dry Bulb and Wet Bulb Temperatures are 49.0 F and 42.0 F, respectively.

TABLE 3-2

TOTAL GENERATING COSTS - 1200 BOILING WATER REACTOR

	Base Case[1]	Once-Through	Natural Draft	Fan-Assisted Natural Draft
Total Base Construction Cost, 10^6	582.7	568.4	583.0	583.3
Generator Output at Average Yearly Ambient, MWe[2]	1235	1247	1244	1238
Auxiliary Requirements, MWe	45	33	44	46
Net Power to Transformers, MWe	1190	1214	1200	1192
Capital Cost Multiplier	Base	0.956	0.992	0.999
Fuel Cost Multiplier	Base	0.980	0.992	0.998
Operating and Maintenance Multiplier	Base	0.980	0.992	0.998

(1) Mechanical Draft Evaporative Towers
(2) The Annual Average Dry Bulb and Wet Bulb Temperatures are 49.0 F and 42.0 F, respectively.

TABLE 3-3

TOTAL GENERATING COSTS - 1200 MWe HIGH SULFUR COAL PLANT

	Base Case[1]	Once-Through	Natural Draft	Fan-Assisted Natural Draft
Total Base Construction Cost, 10^6	465.5	453.5	467.4	467.0
Generator Output at Average Yearly Ambient, MWe[2]	1304	1316	1312	1306
Auxiliary Requirements, MWe	77	70	76	78
Net Power to Transformers, MWe	1227	1246	1236	1228
Capital Cost Multiplier	Base	0.959	0.997	1.002
Fuel Cost Multiplier	Base	0.984	0.993	1.000
Operating and Maintenance Multiplier	Base	0.984	0.993	1.000

(1) Mechanical Draft Evaporative Towers
(2) The Annual Average Dry Bulb and Wet Bulb Temperatures are 49.0 F and 42.0 F, respectively.

TABLE 3-4

TOTAL GENERATING COSTS - 1200 MWe LOW SULFUR COAL PLANT

	Base Case(1)	Once-Through	Natural Draft	Fan-Assisted Natural Draft
Total Base Construction Cost, 10^6	402.8	390.8	404.7	404.3
Generator Output at Average Yearly Ambient, MWe(2)	1304	1316	1312	1306
Auxiliary Requirements, MWe	66	59	65	67
Net Power to Transformers, MWe	1238	1257	1247	1239
Capital Cost Multiplier	Base	0.956	0.997	1.003
Fuel Cost Multiplier	Base	0.985	0.993	0.999
Operating and Maintenance Multiplier	Base	0.985	0.993	0.999

(1) Mechanical Draft Evaporative Towers
(2) The Annual Average Dry Bulb and Wet Bulb Temperatures are 49.0 F and 42.0 F, respectively.

TABLE 3-5

TOTAL GENERATING COSTS - 800 MWe LOW SULFUR COAL PLANT

	Base Case(1)	Once-Through	Natural Draft	Fan-Assisted Natural Draft
Total Base Construction Cost, 10^6	287.4	287.4	289.4	287.4
Generator Output at Average Yearly Ambient, MWe(2)	853	857	856	854
Auxiliary Requirements, MWe	53	48	52	54
Net Power to Transformers, MWe	800	809	804	800
Capital Cost Multiplier	Base	0.958	1.002	1.000
Fuel Cost Multiplier	Base	0.989	0.995	1.000
Operating and Maintenance Multiplier	Base	0.989	0.995	1.000

(1) Mechanical Draft Evaporative Towers
(2) The Annual Average Dry Bulb and Wet Bulb Temperatures are 49.0 F and 42.0 F, respectively.

TABLE 3-6

TOTAL GENERATING COSTS - 800 MWe HIGH SULFUR COAL PLANT

	Base Case[1]	Once-Through	Natural Draft	Fan-Assisted Natural Draft
Total Base Construction Cost, 10^6	335.2	326.2	337.3	335.3
Generator Output at Average Yearly Ambient, MWe[2]	853	857	856	854
Auxiliary Requirements, MWe	60	55	59	61
Net Power to Transformers, MWe	793	802	797	793
Capital Cost Multiplier	Base	0.962	1.001	1.000
Fuel Cost Multiplier	Base	0.989	0.995	1.000
Operating and Maintenance Multiplier	Base	0.989	0.995	1.000

(1) Mechanical Draft Evaporative Towers
(2) The Annual Average Dry Bulb and Wet Bulb Temperatures are 49.0 F and 42.0 F, respectively.

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