Kingston Fossil Plant Coal Yard Runoff Pond Piping Upgrade PCN KIF353

.

June 1, 2000

Team Members:

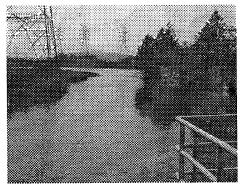
Cherie Minghini (423) 751-6375 Clark Morris (423) 751-3214 Scott Sims (865) 717-2061 Mike Smith (423) 751-6226 Steve Weaver (423) 751-3536

Reason For Improvement

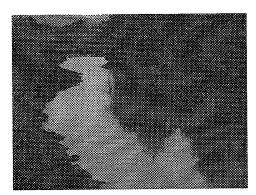
The new coal handling reclaim facility (under construction) flooded on April 29, 1999. The Coal Yard Runoff Pond is approximately 80% full of coal settlement, which leaves only 20% of storage capacity for rain runoff water. This excess drainage backs up onto the coal storage area.

Problem Definition

The rain on 4/29/99, measured 1.75 inches in a 24 hour period. The potential for this magnitude of rain is on average 4.75 (5) times per year, based on historical rain data.



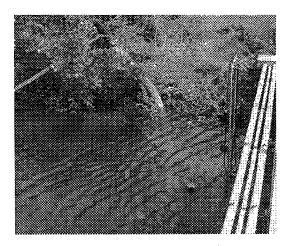
(Picture of Coal Yard Runoff Pond After Rain)

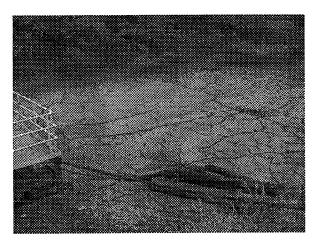


(Same Pond in Between Rain Events)

Analysis

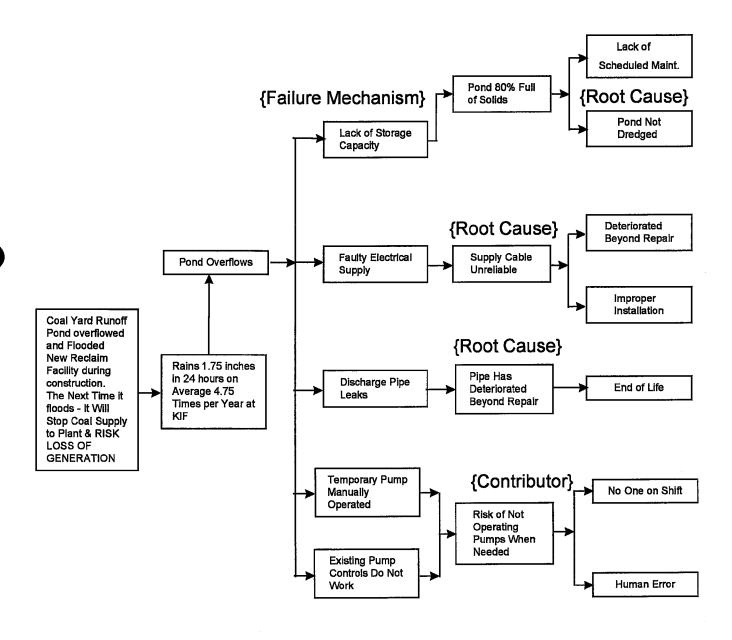
- Heavy rain falls have washed fine particles of coal from the Coal Storage Yard into the Coal Yard Runoff Pond decreasing the storage capacity of the pond to about 20% of the original volume.
- Deteriorated Fiberglass Discharge Piping could not handle the increased pressure of the two existing pumps operating simultaneously and
 - The Fiberglass Pipe has <u>now</u> been permanently severed for construction of new railroad loop track to the rail hopper, and is no longer usable.
 - Only one of the two existing pumps could be operated at a time, and could not keep up with the runoff.
- A temporary diesel pump and 14 inch discharge pipe is being used to assist in flood control. This pump & piping will be removed once the reclaim facility construction is complete, scheduled for fall of 2000.
- Presently the existing Pumps are connected to the temporary diesel pump discharge piping.
- The Existing Pumps' Electrical Power Feed is:
 - Deteriorated beyond repair,
 - Unreliable,
 - Permanently severed for construction of new railroad loop track to the rail hopper, and is no longer usable.
 - Trips breaker if both pumps operate at same time.
- The Coal Yard Runoff Pump Controls no longer work and the pumps must be manually turned on and off.
 - Human error could put the new reclaim facility at risk of flooding if pumps are not turned on when needed.





(Pictures Are Attempting to Show Relative Small Volume of Available Storage Capacity)

Analysis Continued



Solutions

Flooding of the new reclaim tunnels will shut off the supply of coal and risk the Loss of Generation.

Funding for the following will significantly reduce risk:

- Dredge pond to original storage capacity and enlarge.
- Install a new 10" HDPE discharge pipe from pumps to ash pond (approx. 4200 ft.), sleeve under railroad tracks and main plant road.
- Install a new power feed from new electrical equipment room through new reclaim tunnel, and a direct burial armored cable from end of tunnel to the pumps. Cable will be buried 5 feet deep and sleeved at road crossings.
- Utilize two existing 1200 gpm pumps at existing pump platform. Both pumps will be able to run simultaneously.
- Install pump float switches for auto start/stop. This will eliminate most of the human error that could be involved with managing the pumps.

Projected Cost of Solution

•	Install New 10" Discharge Piping	260,000
•	Install New Electrical Feed to Existing Pumps	75,000
•	Dredge Coal Yard Runoff Pond	100,000
•	Install New Local Pump Controls	5,000
•	Engineering	75,000
•	Construction Partner Estimate	10,000
•	Backcharge dredging, pipe and pump rental, labor,	<u>\$165,000</u>
	etc.	
•	TOTAL	\$690,000

Solutions Continued

Do Nothing Alternative

- If nothing is done to prevent flooding, the new multi-million dollar reclaim facility tunnels could flood, on average, 5 times per year shutting off the supply of coal to the powerhouse until the water and coal can be pumped out, and the following components dried, cleaned, inspected, repaired and/or replaced:
 - motors, variable speed drive, gear reducers, conveyor belt idlers, bearings
 - electronic circuitry, belt scales, limit switches
 - downtime 8 to 12 weeks

Cost

 Damage associated with the flooded reclaim facility tunnels, estimated by Roberts & Schaefer (R&S)

\$3,000,000



Solutions Continued

Status Quo Alternative

• The present interim operation consists of using a portable diesel pump & above ground dredge pipe. The rental of a manually operated, portable diesel pump and pipe should not be an alternative considered in this evaluation. This option was put in place temporarily as a quick fix before a permanent fix was accomplished.

Risks

- Existing temporary diesel pump
 - Temporary pump will be removed at close of reclaim project.
 - Temporary above ground pipe is HED dredge pipe and could be removed as required by HED.
- Availability of rental pumps and piping
- Reliability
- · Flooding when no one is on shift & human error
- Temporary routing of piping will cause damage to other areas of the reservation. The use of drain culverts to route pipe underneath railroad tracks and roads could cause wash out of track beds and/or pavement damage.
- Exposure of temporary above ground pipe is subject to damage from heavy equipment.

<u>Costs</u>

• The rental cost, fuel cost, labor cost for year round use:

\$101,280

Cost of replacement dredge pipe for HED:

<u>\$40,000</u>

- Costs associated with risks of flooding are similar to the Do Nothing Alternative:
 - Damage associated with the flooded reclaim facility tunnels, estimated by Roberts & Schaefer (R&S):

\$3,000,000

 Emergency interim coal handling operation to prevent or reduce derating of all 10 units will cost an additional amount as follows during the downtime:

\$330,000 to \$500,000

Solution Matrix

	Possible Solutions	Barriers	Aids	Implement
1	Dredge Pond, Install new 10" Piping, Install new Power Feed & New Pump Controls	High Capital Cost, \$850,000	Best Solution to prevent flooding & Avoid Loss of Power Generation	YES
2	Do Nothing Alternative, This option should NOT be Considered	Significant Certainty of Flooding Reclaim Facility an Average 5 Times per year, costing up to \$3,000,000 for each flood to restore plus up to \$500,000 for each emergency interim coal handling operation & possible deratings of all 10 units	No capital cost	No
3	Rent portable diesel pump	Not reliable, manually operated, risk of flooding when nobody is on shift, human error of neglecting to operate diesel pump, high O&M Costs of \$101,280 per year, cost of \$40,000 to replace HED dredge pipe. Use of temporary pipe routing risks the back up of water in other areas putting at risk the railroad tracks, roads, etc. Potential risk of flooding reclaim facility costing \$3,000,000 for each flood to restore plus up to \$500,000 for each emergency interim coal handling operation & possible deratings of all 10 units	No capital cost	No

KINGSTON FOSSIL PLANT COAL YARD RUNOFF POND PIPING UPGRADE

March 17, 2000

Contacts:

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Scott Sims (423) 717-2061

Fossil Engineering Services

Cherie Minghini (423) 751-6375 Mike Smith (423) 751-6226 Steve Weaver

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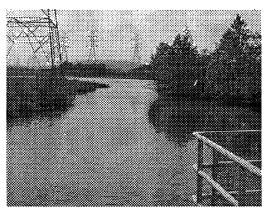


REASON FOR IMPROVEMENT

The new coal handling reclaim facility (under construction) flooded on April 29, 1999. The Coal Yard Runoff Pond is approximately 80% full of coal settlement, which leaves only 20% of storage capacity for rain runoff water. This excess drainage backs up onto the coal storage area

PROBLEM DEFINITION

The rain on 4/29/99, measured 1.75 inches in a 24 hour period. The potential for this magnitude of rain is on average 4.75 times per year, based on historical rain data.



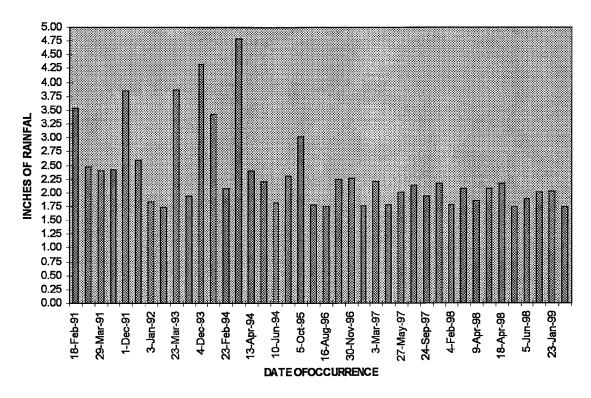
(Picture of Coal Yard Runoff Pond After Rain) (Same Pond in Between Rain Events)



PROBLEM DEFINITION-CONTINUED

Kingston	Significant	Rain Data
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	rangoton organization Data			
Date of	Inches of Rain	Date of	Inches of Rain	
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29-Mar-91	2.40	30-Nov-96	2.27	
22-Nov-91	2.42	24-Jan-97	1.76	
1-Dec-91	3.85	3-Mar-97	2.21	
2-Dec-91	2.60	26-May-97	1.79	
3-Jan-92	1.83	27-May-97	2.01	
4-Oct-92	1.74	14-Jun-97	2.13	
23-Mar-93	3.87	24-Sep-97	1.95	
6-Aug-93	1.94	26-Oct-97	2.18	
4-Dec-93	4.32	4-Feb-98	1.78	
11-Feb-94	3.42	8-Mar-98	2.09	
23-Feb-94	2.08	9-Apr-98	1.85	
27-Mar-94	4.78	17-Apr-98	2.08	
13-Apr-94	2.41	18-Apr-98	2.17	
26-May-94	2.20	26-May-98	1.75	
10-Jun-94	1.82	5-Jun-98	1.89	
16-Jul-94	2.32	23-Jul-98	2.01	
5-Oct-95	3.02	23-Jan-99	2.03	
9-Jun-96	1.79	29-Apr-99	1.75	



(Daily Rain Measurements by TVA, Sorted To Include Only 1.75" / 24 Hr. Rains)

ANALYSIS

- 1. Over the years heavy rain falls have washed fine particles of coal from the Coal Storage Yard into the Coal Yard Runoff Pond which has deceased the storage capacity of the pond to about 20% of the original volume.
- 2. In addition to the heavy rains, only one of the two existing pumps can be operated at a time, thus not allowing the pumps to keep up with the runoff. Only one pump can operate at a time due to the following reasons:
 - Deteriorated Fiberglass Discharge Piping can not handle the increased pressure of both pumps operating simultaneously:
 - Fiberglass Pipe has <u>now</u> been permanently severed for construction of new railroad loop track to the rail hopper, and is no longer usable.
 - Presently the existing Pumps are connected to the temporary diesel pump discharge piping. The purpose of the temporary pump is to assist in keeping the Reclaim Facility Construction Site dry.
 - The temporary diesel pump is scheduled to be removed once construction is complete. (Fall of calendar year 2000)
- 3. The Coal Yard Runoff Pump Controls no longer work and the pumps must be manually turned on and off.
- 4. Pumps' Electrical Power Feed is:
 - Deteriorated beyond repair,
 - Unreliable,
 - Only one pump can be operated at a time.





(Pictures Are Attempting to Show Relative Small Volume of Available Storage Capacity)

SOLUTIONS

- 1. Install a new 10" HDPE discharge pipe from pumps to ash pond (4200 ft.), sleeve under railroad tracks and main plant road.
- 2. Install a new power feed from new electrical equipment room through new reclaim tunnel, and a direct burial armored cable from end of tunnel to the pumps. Cable will be buried 5 feet deep and sleeved at road crossings.
- 3. Dredge pond to original storage capacity and enlarge if possible.
- 4. Install pump float switches for auto start/stop.

Projected Cost of Solution

1.	Replace the pump discharge piping from the floating platform to the	\$150,000
	ash pond with HDPE piping	(550,000)
2.	Install a new electrical feed through the reclaim tunnel to the floating	\$125,000
	platform.	(200,000)
3.	Dredge pond to provide additional storage capacity, 16K cu. Yd	\$50,000
		(100,000)
4.	Controls, float switches	\$2,000
		(5,000)
5.	Engineering	\$25,000
		(75,000)
6.	Contingency	<u>\$27,000</u>
		(60,000)
<u>7.</u>	Partner Estimate	\$10,000
	TOTAL	\$379,000
		(1,000,000)

OTHER OPTIONS CONSIDERED

Do Nothing Option

The status quo should not be considered. Flooding of the new reclaim tunnels will shut off the supply of coal until the water and coal can be pumped out, and the new motors, variable speed drive electronic circuitry, belt scales, limit switches as well as damaged gear reducers, conveyor belt idlers, bearings, etc. are dried, cleaned inspected repaired and/or replaced, resulting in emergency hauling of coal, and possible derating of all 10 units.

OTHER OPTIONS CONSIDERED- CONTINUED

Projected Cost of Do Nothing Option

- Roberts & Schaefer (R&S) estimates damages at approximately \$3,000,000 for the above worst case scenario. Also, this does not include additional costs associated with emergency coal handling operations while the reclaim facility is being restored.
- Downtime of the reclaim and unloader facilities is estimated to be from at least 8 to 12 weeks just to return to a limited operation. In order to keep the plant on line, an interim coal handling operation would be necessary during the downtime. We estimate additional coal handling costs would range from \$330,000 to \$500,000.

Status Quo Option

The rental of a portable diesel pump is an alternative considered in this evaluation. Based on the historical rain data, the diesel pump and discharge piping will need to be rented 5 times per year. The costs associated with this are as follows:

•	Rent Portable Diesel Pump	\$25,200
•	Fuel Costs for Pump	\$3,000
•	Laborer to Fuel, Operate & Maintain Pump	\$3,000
•	Rent Discharge Pipe	\$1,200
•	Dredge Portion of Pond	<u>\$10,000</u>

Total Annual Costs \$42,200

KINGSTON FOSSIL PLANT COAL YARD RUNOFF POND PIPING UPGRADE

March 17, 2000

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Contacts:

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REASON FOR IMPROVIEWENT

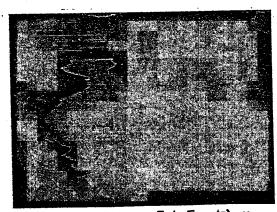
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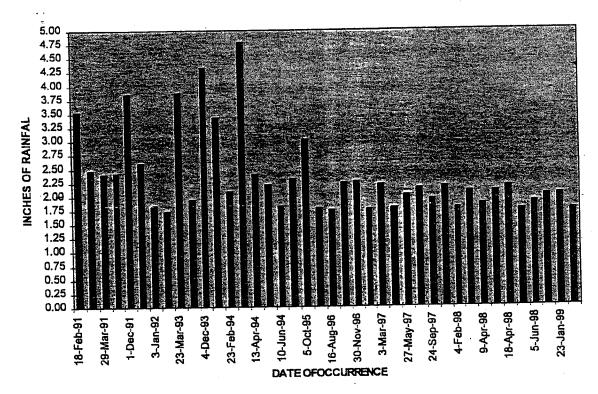
(Picture of Coal Yard Runoff Pond After Rain)



(Same Pond in Between Rain Events)

PROBLEM DEFINITION CONTINUED

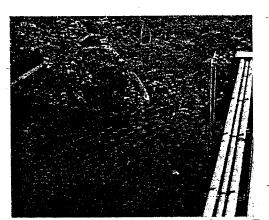
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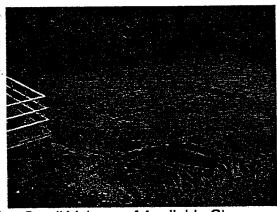


(Daily Rain Measurements by TVA, Sorted To Include Only 1.75" / 24 Hr. Rains)

ANALYSIS

- 1. Over the years heavy rain falls have washed fine particles of coal from the Coal Storage Yard into the Coal Yard Runoff Pond which has deceased the storage capacity of the pond to about 20% of the original volume.
- 2. In addition to the heavy rains, only one of the two existing pumps can be operated at a time, thus not allowing the pumps to keep up with the runoff. Only one pump can operate at a time due to the following reasons:
 - Deteriorated Fiberglass Discharge Piping can not handle the increased pressure of both pumps operating simultaneously:
 - Fiberglass Pipe has <u>now</u> been permanently severed for construction of new railroad loop track to the rail hopper, and is no longer usable.
 - Presently the existing Pumps are connected to the temporary diesel pump discharge piping. The purpose of the temporary pump is to assist in keeping the Reclaim Facility Construction Site dry.
 - The temporary diesel pump is scheduled to be removed once construction is complete. (Fall of calendar year 2000)
- 3. The Coal Yard Runoff Pump Controls no longer work and the pumps must be manually turned on and off.
- 4. Pumps' Electrical Power Feed is:
 - Deteriorated beyond repair,
 - Unreliable,
 - Only one pump can be operated at a time.





(Pictures Are Attempting to Show Relative Small Volume of Available Storage Capacity)

SOLUTIONS

- 1. Install a new 10" HDPE discharge pipe from pumps to ash pond (4200 ft.), sleeve under railroad tracks and main plant road.
- 2. Install a new power feed from new electrical equipment room through new reclaim tunnel, and a direct burial armored cable from end of tunnel to the pumps. Cable will be buried 5 feet deep and sleeved at road crossings.
- 3. Dredge pond to original storage capacity and enlarge if possible.
- 4. Install pump float switches for auto start/stop.

Pr	ojected Cost of Solution	
1.	Replace the pump discharge piping from the floating platform to the	\$150,000
	ash nond with HDPE piping	\$125,000 -
2.	Install a new electrical feed through the reclaim tunnel to the floating	Ψ125,000
	platform.	\$50,000
3.	Dredge pond to provide additional storage capacity, 16K cu. Yd	
	Controls, float switches	\$2,000
	Engineering	\$25,000
		\$27,000-
6.	Contingency	\$379,000
	TOTAL.	\$3/9,000

OTHER OPTIONS CONSIDERED

Do Nothing Option

The status quo should not be considered. Flooding of the new reclaim tunnels will shut off the supply of coal until the water and coal can be pumped out, and the new motors, variable speed drive electronic circuitry, belt scales, limit switches as well as damaged gear reducers, conveyor belt idlers, bearings, etc. are dried, cleaned inspected repaired and/or replaced, resulting in emergency hauling of coal, and possible derating of all 10 units.

Projected Cost of Do Nothing Option

- Roberts & Schaefer (R&S) estimates damages at approximately \$3,000,000 for the above worst case scenario. Also, this does not include additional costs associated with emergency coal handling operations while the reclaim facility is being restored.
- Downtime of the reclaim and unloader facilities is estimated to be from at least 8 to 12 weeks just to return to a limited operation. In order to keep the plant on line, an interim coal handling operation would be necessary during the downtime. We estimate additional coal handling costs would range from \$330,000 to \$500,000.

OTHER OPTIONS CONSIDERED- CONTINUED

Status Quo Option

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tiod o times per years	#05.000
Rent Portable Diesel Pump	\$25,200
	\$3,000
	\$3,000
	\$1,200
	<u>\$10,000</u>
Total Annual Costs	\$42,200
	Rent Portable Diesel Pump Fuel Costs for Pump Laborer to Fuel, Operate & Maintain Pump Rent Discharge Pipe Dredge Portion of Pond

PROJECT NAME

NGSTON FOSSIL PLANT - COAL YARD RUNOFF POND - PIPING UPGRADE

PROJECT ID

FY: 2000 R#:

0

II. PROJECT ECONOMIC EVALUATION

PROJECT COST

PROJECT ECONOMIC INDICATORS

	Thousands of Dollars
SUNK COST:	\$0
REMAINING COST:	\$0
TOTAL COST:	\$379,000
	(includes
	contingency)
CONTINGENCY:	\$27,000
FORECAST:	<i>\$0</i>

NPV:	@15%	IRR:	%
PI:	@ 15%	PAYBACK:	yrs.
		-	
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			•

PROJECT CASH FLOW

Costs: FY2001	. a committee
This project consists of the following: 1 Replace the pump discharge piping from the floating platform to the ash pond with	\$150,000
HDPE piping 2 Install a new electrical feed through the reclaim tunnel to the	\$125,000
floating platform. 3 Engineering	\$25,000
4 Dredge pond to provide additional storage capacity, 16K cu. yd.=3000K gallons	\$50,000
5 Controls, float switches	\$2,000 \$27,000
Contingency	Total \$379,000

SUNK Sest: fit:	0 0				Discounted @				Cost: Benefit:	0
Year:	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Cost:										
Benefit:										
Cum NPV:										
Year:	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Cost:										
Benefit:										
Cum NPV:										

PROJECT NAME

PROJECT ID

FY: 2001

R#:

II. PROJECT ECONOMIC EVALUATION (continued)

ļ		COST	ASSUMPTIONS			
				S	Sensitivity/Ra	nge
		CL			Most	
	Cost Assumptions	<u>L/M/H</u>	Basis for Confidence Level (CL)	<u>Low</u>	<u>Probable</u>	<u>High</u>

BENEFIT ASSUMPTIONS

Sensitivity/Range

Most

Benefit Assumptions L/M/H Basis for Confidence Level (CL) Low Probable High

CL

Page 3 4/15/99

•	CAPITAL PROJECT JUSTIFIC				
	PROJECT NAME	PR	OJECT ID		
(1987)					
•		□ FY	2001	R #:	0

III. PROGRAM PLAN

IV. PROJECT COORDINATION

SHOULD THIS PROJECT BE LINKED TO ONE OR MORE OTHER PROJECTS?

TIFICATION FOR	
	PROJECT ID
	2001 70"
	FY: 2001 R#: (
this page.)	
LEAR SAFETY (Provi	de specific references)
-	, w
	nt*
JANCE (Financial, Le	gal, Political)?
	•
RESOLVE THIS ISSU	JE?
NO:	If NO, list other projects required
	· · •
VE OTHER ISSUES?	
VE OTHER ISSUES?	
VE OTHER ISSUES?	X
NO:	X
NO: JNDED THIS YEAR?	X
	this page.) LEAR SAFETY (Providence of the control

CAPITAL PROJECT JUSTIFICATION FORM PROJECT ID PROJECT NAME R#: FY: 2001 VI. BOARD / STRATEGIC WHO DIRECTED? WHEN? WHY (Tie to Strategic Directive)?

	THIS PROJECT MUST BE	FUNDED THIS YEAR?		
YES If YES, Why?			NO:	x
•				
		·		
	-			•
				,
	· · · · · · · · · · · · · · · · · · ·		(Date)	
This project must be completed b	у:			

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KINGSTON FOSSIL PLANT COAL YARD RUNOFF POND PIPING UPGRADE

March 17, 2000

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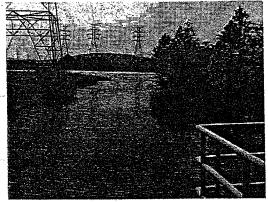
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REASON FOR IMPROVEMENT

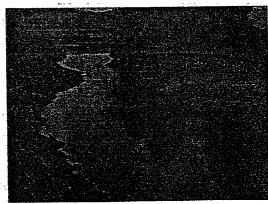
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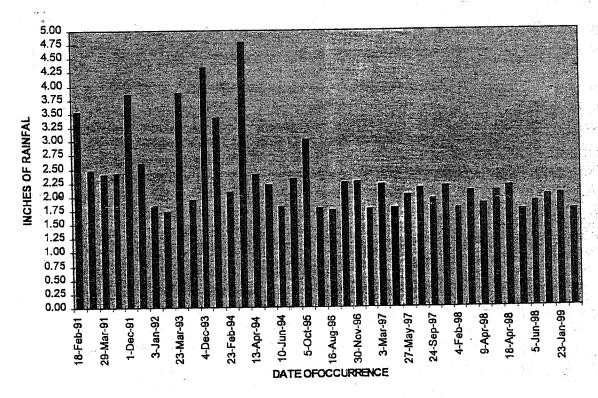
(Picture of Coal Yard Runoff Pond After Rain)



(Same Pond in Between Rain Events)

PROBLEM DEFINITION-CONTINUED

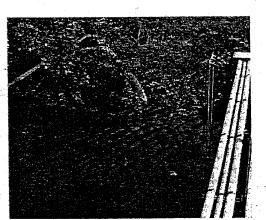
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	3-Jan-92	1.83	27-May-97	2.01
	4-Oct-92	1.74	14-Jun-97	2.13
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	6-Aug-93	1.94	26-Oct-97	2.18
	4-Dec-93	4.32	4-Feb-98	1.78
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	23-Feb-94	2.08	9-Apr-98	1.85
	27-Mar-94	4.78	17-Apr-98	2.08
	13-Apr-94	2.41	18-Apr-98	2.17
	26-May-94	2.20	26-May-98	1.75
	10-Jun-94	1.82	5-Jun-98	1.89
	16-Jul-94	2.32	23-Jul-98	2.01
	5-Oct-95	3.02	23-Jan-99	2.03
	9-Jun-96	1.79	29-Apr-99	1.75

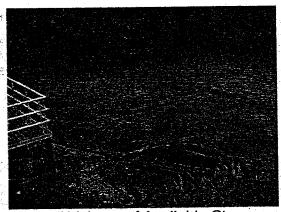


(Daily Rain Measurements by TVA, Sorted To Include Only 1.75" / 24 Hr. Rains)

ANALYSIS

- 1. Over the years heavy rain falls have washed fine particles of coal from the Coal Storage Yard into the Coal Yard Runoff Pond which has deceased the storage capacity of the pond to about 20% of the original volume.
- 2. In addition to the heavy rains, only one of the two existing pumps can be operated at a time, thus not allowing the pumps to keep up with the runoff. Only one pump can operate at a time due to the following reasons:
 - Deteriorated Fiberglass Discharge Piping can not handle the increased pressure of both pumps operating simultaneously:
 - Fiberglass Pipe has <u>now</u> been permanently severed for construction of new railroad loop track to the rail hopper, and is no longer usable.
 - Presently the existing Pumps are connected to the temporary diesel pump discharge piping. The purpose of the temporary pump is to assist in keeping the Reclaim Facility Construction Site dry.
 - The temporary diesel pump is scheduled to be removed once construction is complete. (Fall of calendar year 2000)
- 3. The Coal Yard Runoff Pump Controls no longer work and the pumps must be manually turned on and off.
- 4. Pumps' Electrical Power Feed is:
 - Deteriorated beyond repair,
 - Unreliable,
 - Only one pump can be operated at a time.





(Pictures Are Attempting to Show Relative Small Volume of Available Storage Capacity)

SOLUTIONS

- 1. Install a new 10" HDPE discharge pipe from pumps to ash pond (4200 ft.), sleeve under railroad tracks and main plant road.
- 2. Install a new power feed from new electrical equipment room through new reclaim tunnel, and a direct burial armored cable from end of tunnel to the pumps. Cable will be buried 5 feet deep and sleeved at road crossings.
- 3. Dredge pond to original storage capacity and enlarge if possible.
- 4. Install pump float switches for auto start/stop.

Projected Cost of Solution	
1. Replace the pump discharge piping from the floating platform to the	\$150,000
ash pond with HDPE piping	
2. Install a new electrical feed through the reclaim tunnel to the floating	\$125,000
platform.	
3. Dredge pond to provide additional storage capacity, 16K cu. Yd	\$50,000
4. Controls, float switches	\$2,000
5. Engineering	\$25,000
6. Contingency	<u>\$27,000</u> -
TOTAL	\$379,000

OTHER OPTIONS CONSIDERED

Do Nothing Option

The status quo should not be considered. Flooding of the new reclaim tunnels will shut off the supply of coal until the water and coal can be pumped out, and the new motors, variable speed drive electronic circuitry, belt scales, limit switches as well as damaged gear reducers, conveyor belt idlers, bearings, etc. are dried, cleaned inspected repaired and/or replaced, resulting in emergency hauling of coal, and possible derating of all 10 units.

Projected Cost of Do Nothing Option

- Roberts & Schaefer (R&S) estimates damages at approximately \$3,000,000 for the above worst case scenario. Also, this does not include additional costs associated with emergency coal handling operations while the reclaim facility is being restored.
- Downtime of the reclaim and unloader facilities is estimated to be from at least 8 to 12 weeks just to return to a limited operation. In order to keep the plant on line, an interim coal handling operation would be necessary during the downtime. We estimate additional coal handling costs would range from \$330,000 to \$500,000.

OTHER OPTIONS CONSIDERED- CONTINUED

Status Quo Option

The rental of a portable diesel pump is an alternative considered in this evaluation. Based on the historical rain data, the diesel pump and discharge piping will need to be rented 5 times per year. The costs associated with this are as follows:

•	Rent Portable Diesel Pump	\$25,200
•	Fuel Costs for Pump	\$3,000
•	Laborer to Fuel, Operate & Maintain Pump	\$3,000
	Rent Discharge Pipe	\$1,200
•	Dredge Portion of Pond	<u>\$10,000</u>
	Total Annual Costs	\$42,200

PROJECT NAME

"NGSTON FOSSIL PLANT - COAL YARD RUNOFF POND - PIPING UPGRADE

PROJECT ID

KINGSTON FY: 2001

R#: 0

I. PROJECT DESCRIPTION

PROJECT LOCATION / CSC:

OWNER

FPG

ORGANIZATION

LEAD

KINGSTON

TECHNICAL CONTACT

NAME: STEVE WEAVER

PHONE: (423) 751-3536

LOCATION: LP 2T-C

SPONSORED BY

NAME: SCOTT SIMS

PHONE: (423) 717-2061 LOCATION: KINGSTON

PROJECT CATEGORY

Economic & Regulatory

(ECONOMIC, CUSTOMER, REGULATORY, BOARD, BLANKET)

REASON FOR IMPROVEMENT (Consequences of not doing)

Coal yard drainage basin overflows its' banks during moderate rains of 1.75 inches/24 hrs. The water flows onto the coal storage area which will fill up the new underground coal live pile reclaim structure (under construction). The potential for this magnitude of rain is on average 4.75 times per year, based on historical rain data.

PROBLEM DEFINITION

settlement has reduced the capacity of the drainage basin (pond) by at least 80%. Only one of the two pumps can be operated at a time due to deteriorated discharge piping. Pump must be manually turned on/off. The electrical power feed is deteriorated beyond repair. Flooding the new reclaim tunnels will shut off the supply of coal until it can be pumped out, and the new motors, variable speed drive electronic circuitry, belt scales, limit switches are dried, cleaned inspected repaired and/or replaced, resulting in emergency hauling of coal by pan scrapers to the rotary car dumper, and possible derating of all 10 units, if nothing is done (status quo).

PROJECT SCOPE

Dredge pond to original storage capacity and enlarge if possible. Install a new 10" HDPE discharge pipe from pumps to ash pond (4200 ft.), sleeve under railroad tracks and plant road. Install pump float switches for auto start/stop. Install a new power feed from new electrical equipment room through new reclaim tunnel, and a direct burial armored cable from end of tunnel to the pumps. Cable will be buried 5 feet deep and sleeved at road crossings.

IMPACT OF DELAY TO NEXT AVAILABLE IMPLEMENTATION WINDOW

Possible derating of all 10 units at KIF

HOW WILL THE ACHIEVEMENT OF CLAIMED BENEFITS BE MEASURED FOR THIS PROJECT?

- 1. No disruption to the new coal reclaim facility operation from potential flooding from runoff pond overflow...
 - No derating of units resulting from flooding of new reclaim facility.
 - Avoid additional coal handling costs associated with flooding of new reclaim facility.
- 4. No environmental impacts (REE'S) of pond overflow into river

Page 1 4/15/99

PROJECT NAME

'NGSTON FOSSIL PLANT - COAL YARD RUNOFF POND - PIPING UPGRADE

PROJECT ID

FY: 2000 R#:

II. PROJECT ECONOMIC EVALUATION

PROJECT COST

PROJECT ECONOMIC INDICATORS

	to the configuration of the	
- 1	Thousands of Dollars	.**
SUNK COST:	\$0	
 REMAINING COST:	\$0	
TOTAL COST:	\$379,000 (includes contingency)	
CONTINGENCY:	\$27,000	
FORECAST:	\$0	
	* :	

NPV:	@15%	IRR: %
PI:	@ 15%	PAYBACK: yrs.
1		
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		그 집에 나는 그는 사용하다면 그
Ì		

PROJECT CASH FLOW

Costs: FY2001		
This project consists of the following:		
1 Replace the pump discharge piping from	om the floating platform to the as	h pond with \$150,000
HDPE piping		
2 Install a new electrical feed through th	ne reclaim tunnel to the	\$125,000
floating platform.		
3 Engineering		\$25,000
4 Dredge pond to provide additional sto	rage capacity, 16K cu.	\$50,000
yd.=3000K gallons		
5 Controls, float switches	The second secon	\$2,000
Contingency		\$27,000
		Total \$379,000

SUNK Cost: fit:	Cost Benefits + Non-Discounted Cash Flow (1,000s)									O 0
Year:	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Cost:										
Benefit:										4
Cum NPV:										
Year:	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Cost:										
Benefit:										
Cum NPV:										

PROJECT NAME

PROJECT ID

FY: 2001 R#:

II. PROJECT ECONOMIC EVALUATION (continued)

	COST A	ASSUMPTIONS	Sensitivity/Range
	CL		Most
Cost Assumptions	<u>L/M/H</u>	Basis for Confidence Level (CL)	Low Probable High
		보다 보다 하는 것이 되었다. 그는 사람들은 경우 보다 되었다. 	
		면 보는 사람들은 기업적 시민(제공)	
		되어 가장 사람들이 살아 없는데 없는	
	<u>BENEFI)</u>	r assumptions	
	i sa karata		Sensitivity/Range
	CL		Most
Benefit Assumptions	<u>L/M/H</u>	Basis for Confidence Level (CL)	Low Probable High
1			

CAPITAL PROJECT JUSTIFICATION FORM PROJECT ID PROJECT NAME FY: 2001 **R**#: <u>0</u> III. PROGRAM PLAN IV. PROJECT COORDINATION SHOULD THIS PROJECT BE LINKED TO ONE OR MORE OTHER PROJECTS?

Page 4

4/15/99

CAPITA	AL PROJECT JUST	IFICATION FORM		
PROJEC	T NAME		<u>I</u>	PROJECT ID
			FY:	2001 R#:
REGULATORY		Action of the		
his Project is not a Requirement, Commitment,	, or Nuclear Safety, skip th	is page.)		
IS PROJECT IS A			, wy	
		and Cheery (Provide or	naifia raf	~~~~~
SOURCE OF REQUIREMENT, O	COMMITMENT, NUCLI	EAR SAFELT (Provides)	JECHIC I EL	erences)
WHAT IS THE PENALT	Y FOR NON-COMPLI	ANCE (Financial, Legal,	Political)	
DOES THIS PI	ROJECT TOTALLY RI	ESOLVE THIS ISSUE?		
			75.370	
ES: X		NO:	require	list other projects
			rodano	
		· · · · · · · · · · · · · · · · · · ·		
				The last
DOES THE	S PROJECT RESOLVI	OTHER ISSUES?		
DO23 111	D I ROBECT TOLOGET.	<u> </u>		
ES If YES, identify the issue(s)		NO:	ζ	
THIS PRO	DJECT MUST BE FUN	DED THIS YEAR?		
re vere we o	· · · · · · · · · · · · · · · · · · ·	NO:		x
YES: If YES, Why?		NO.		
		· · · · · · · · · · · · · · · · · · ·		
This project must be completed by	v•	(Date)		

Page 5

PROJECT	NAME	28		
		1.30		

PROJECT ID

Y: 2001 R#

VI. BOARD / STRATEGIC			다는 사람들이 있는 사람들이 가장 사람들이 있다.
	WHO DIRECTED?		
			하는 지나는 아랫동안 화를하였다.
	WHEN?		
			100 - 100 -
			그는 얼마 그렇지만 보고 하셨다.
	MONEY (Fig. to Shuntonia Diver	stiva)?	
	WHY (Tie to Strategic Direc	<u>'T1AC) '</u>	그는 그리는 그림을 하다고 있다.
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			[사용하다]
			이 이용에 이용하루 됐었다.
			그리고 그 그는 그는 그를 가는 것이 있다. 그는 그 그는 그는 그는 그들은 수 있는 것 같습니다.
	ki k	96.90	
TI	IIS PROJECT MUST BE FUNDE	D THIS YEAR?	
YES If YES, Why?			NO: X
			그 하는 뭐요 하는 옷을 깨끗하셨다.
		teren (j. 1905) Santa Santa Sa	
This project must be completed by:			(Date)
Page 6 4/15/99			
Page 0 4/13/99			

KINGSTON FOSSIL PLANT. COAL YARD RUNOFF POND PIPING UPGRADE

March 17, 2000

Contacts:

HED - Clark Morris

(423) 751-3214

Scott Sims

(423) 717-2061

Fossil Engineering Services

Mike Smith

(423) 751-6226

Steve Weaver

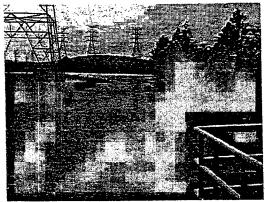
(423) 751-3536

REASON FOR IMPROVEMENT

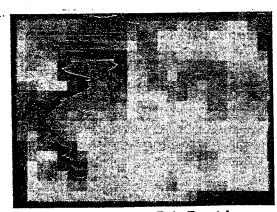
The new coal handling reclaim facility (under construction) flooded on April 29, 1999. The Coal Yard Runoff Pond is approximately 80% full of coal settlement, which leaves only 20% of storage capacity for rain runoff water. This excess drainage backs up onto the coal storage area

PROBLEM DEFINITION

The rain on 4/29/99, measured 1.75 inches in a 24 hour period. The potential for this magnitude of rain is on average 4.75 times per year, based on historical rain data.



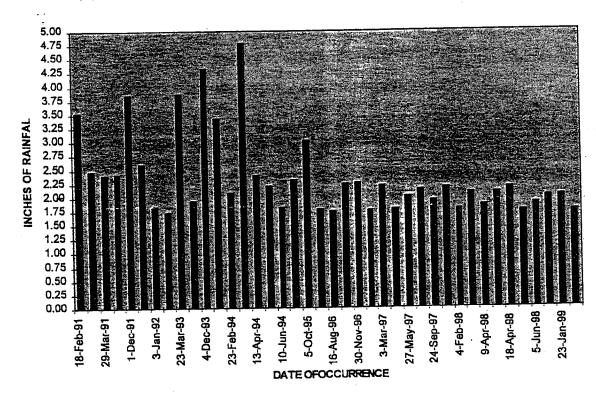
(Picture of Coal Yard Runoff Pond After Rain)



(Same Pond in Between Rain Events)

PROBLEM DEFINITION-CONTINUED

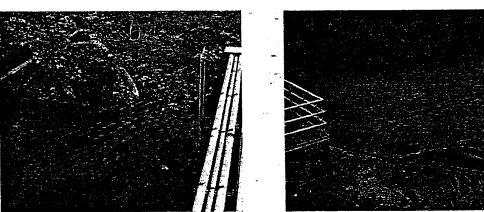
Kingston Significant Rain Data						
Date of	Inches of Rain	Date of	Inches of Rain			
Occurrence	in 24 hrs	Occurrence	in 24 hrs			
18-Feb-91	3.53	16-Aug-96	1.75			
3-Mar-91	2.48	8-Nov-96	2.25			
29-Mar-91	2.40	30-Nov-96	2.27			
22-Nov-91	2.42	24-Jan-97	1.76			
1-Dec-91	3.85	- 3-Mar-97	2.21			
2-Dec-91	2.60	26-May-97	1.79			
3-Jan-92	1.83	27-May-97	2.01			
4-Oct-92	1.74	14-Jun-97	2.13			
23-Mar-93	3.87	24-Sep-97	1.95			
6-Aug-93	1.94	26-Oct-97	2.18			
4-Dec-93	4.32	4-Feb-98	1.78			
11-Feb-94	3.42	8-Mar-98	2.09			
23-Feb-94	2.08	9-Apr-98	1.85			
27-Mar-94	4.78	17-Apr-98	2.08			
13-Apr-94	2.41	18-Apr-98	2.17			
26-May-94	2.20	26-May-98	1.75			
10-Jun-94	· 1.82	5-Jun-98	1.89			
16-Jul-94	2.32	23-Jul-98	2.01			
5-Oct-95	3.02	23-Jan-99	2.03			
9-Jun-96	1.79	29-Apr-99	1.75			



(Daily Rain Measurements by TVA, Sorted To Include Only 1.75" / 24 Hr. Rains)

ANALYSIS

- 1. Over the years heavy rain falls have washed fine particles of coal from the Coal Storage Yard into the Coal Yard Runoff Pond which has deceased the storage capacity of the pond to about 20% of the original volume.
- 2. In addition to the heavy rains, only one of the two existing pumps can be operated at a time, thus not allowing the pumps to keep up with the runoff. Only one pump can operate at a time due to the following reasons:
 - Deteriorated Fiberglass Discharge Piping can not handle the increased pressure of both pumps operating simultaneously:
 - Fiberglass Pipe has <u>now</u> been permanently severed for construction of new railroad loop track to the rail hopper, and is no longer usable.
 - Presently the existing Pumps are connected to the temporary diesel pump discharge piping. The purpose of the temporary pump is to assist in keeping the Reclaim Facility Construction Site dry.
 - The temporary diesel pump is scheduled to be removed once construction is complete. (Fall of calendar year 2000)
- 3. The Coal Yard Runoff Pump Controls no longer work and the pumps must be manually turned on and off.
- 4. Pumps' Electrical Power Feed is:
 - Deteriorated beyond repair,
 - Unreliable,
 - Only one pump can be operated at a time.



(Pictures Are Attempting to Show Relative Small Volume of Available Storage Capacity)

SOLUTIONS

- 1. Install a new 10" HDPE discharge pipe from pumps to ash pond (4200 ft.), sleeve under railroad tracks and main plant road.
- 2. Install a new power feed from new electrical equipment room through new reclaim tunnel, and a direct burial armored cable from end of tunnel to the pumps. Cable will be buried 5 feet deep and sleeved at road crossings.
- 3. Dredge pond to original storage capacity and enlarge if possible.
- 4. Install pump float switches for auto start/stop.

rojected Cost of Solution	
Replace the pump discharge piping from the floating platform to the	\$150,000
ash pond with HDPE piping	#175:000
Install a new electrical feed through the reclaim tunnel to the floating	\$125,000 -
platform.	##0 000
Dredge pond to provide additional storage capacity, 16K cu. Yd	\$50,000
	\$2,000
	\$25,000
	<u>\$27.000</u> -
• •	\$379,000
	Install a new electrical feed through the reclaim tunnel to the floating

OTHER OPTIONS CONSIDERED

Do Nothing Option

The status quo should not be considered. Flooding of the new reclaim tunnels will shut off the supply of coal until the water and coal can be pumped out, and the new motors, variable speed drive electronic circuitry, belt scales, limit switches as well as damaged gear reducers, conveyor belt idlers, bearings, etc. are dried, cleaned inspected repaired and/or replaced, resulting in emergency hauling of coal, and possible derating of all 10 units.

Projected Cost of Do Nothing Option

- Roberts & Schaefer (R&S) estimates damages at approximately \$3,000,000 for the above worst case scenario. Also, this does not include additional costs associated with emergency coal handling operations while the reclaim facility is being restored.
- Downtime of the reclaim and unloader facilities is estimated to be from at least 8 to 12 weeks just to return to a limited operation. In order to keep the plant on line, an interim coal handling operation would be necessary during the downtime. We estimate additional coal handling costs would range from \$330,000 to \$500,000.

OTHER OPTIONS CONSIDERED- CONTINUED

Status Quo Option

The rental of a portable diesel pump is an alternative considered in this evaluation. Based on the historical rain data, the diesel pump and discharge piping will need to be rented 5 times per year. The costs associated with this are as follows:

•	Rent Portable Diesel Pump	\$25,200
•	Fuel Costs for Pump	\$3,000
•	Laborer to Fuel, Operate & Maintain Pump	\$3,000
	Rent Discharge Pipe	\$1,200
	Dredge Portion of Pond	\$10,000
	Total Annual Costs	\$42,200

PROJECT NAME

NGSTON FOSSIL PLANT - COAL YARD RUNOFF POND - PIPING UPGRADE

PROJECT ID
KINGSTON

FY: 2001 R#:

R#: 0

I. PROJECT DESCRIPTION

PROJECT LOCATION / CSC:		ORGANIZATION
	OWNER	<u>LEAD</u>
·	FPG	KINGSTON
	1 1	

TECHNICAL CONTACT	SPONSORED BY
NAME: STEVE WEAVER	NAME: SCOTT SIMS
PHONE: (423) 751-3536	PHONE: (423) 717-2061
LOCATION: LP 2T-C	LOCATION: KINGSTON

PROJECT CATEGORY

Economic & Regulatory

(ECONOMIC, CUSTOMER, REGULATORY, BOARD, BLANKET)

REASON FOR IMPROVEMENT (Consequences of not doing)

Coal yard drainage basin overflows its' banks during moderate rains of 1.75 inches/24 hrs. The water flows onto the coal storage area which will fill up the new underground coal live pile reclaim structure (under construction). The potential for this magnitude of rain is on average 4.75 times per year, based on historical rain data.

PROBLEM DEFINITION

oettlement has reduced the capacity of the drainage basin (pond) by at least 80%. Only one of the two pumps can be operated at a time due to deteriorated discharge piping. Pump must be manually turned on/off. The electrical power feed is deteriorated beyond repair. Flooding the new reclaim tunnels will shut off the supply of coal until it can be pumped out, and the new motors, variable speed drive electronic circuitry, belt scales, limit switches are dried, cleaned inspected repaired and/or replaced, resulting in emergency hauling of coal by pan scrapers to the rotary car dumper, and possible derating of all 10 units, if nothing is done (status quo).

PROJECT SCOPE

Dredge pond to original storage capacity and enlarge if possible. Install a new 10" HDPE discharge pipe from pumps to ash pond (4200 ft.), sleeve under railroad tracks and plant road. Install pump float switches for auto start/stop. Install a new power feed from new electrical equipment room through new reclaim tunnel, and a direct burial armored cable from end of tunnel to the pumps. Cable will be buried 5 feet deep and sleeved at road crossings.

IMPACT OF DELAY TO NEXT AVAILABLE IMPLEMENTATION WINDOW

Possible derating of all 10 units at KIF

HOW WILL THE ACHIEVEMENT OF CLAIMED BENEFITS BE MEASURED FOR THIS PROJECT?

No disruption to the new coal reclaim facility operation from potential flooding from runoff pond overflow...

No derating of units resulting from flooding of new reclaim facility.

Avoid additional coal handling costs associated with flooding of new reclaim facility.

4. No environmental impacts (REE'S) of pond overflow into river

Page 1 4/15/99

PROJECT NAME

NGSTON FOSSIL PLANT - COAL YARD RUNOFF POND - PIPING UPGRADE

PROJECT ID

FY: 2000 R#: 9

II. PROJECT ECONOMIC EVALUATION

PROJECT COST

PROJECT ECONOMIC INDICATORS

	Thousands of Dollars
SUNK COST:	\$0
REMAINING COST:	\$0
TOTAL COST:	\$379,000
	(includes
	contingency)
CONTINGENCY:	\$27,000
FORECAST:	\$0
1	

NPV:	@15%	IRR:	%
PI:	@ 15%	PAYBACK:	yrs.
		-	
1			

PROJECT CASH FLOW

Costs: FY2001	
This project consists of the following:	#1 EO OOG
1 Replace the pump discharge piping from the floating platform to the ash pond with	\$150,000
HDPE piping	#10 <i>E</i> 000
2 Install a new electrical feed through the reclaim tunnel to the	\$125,000
floating platform.	#0 <i>5</i> :000
3 Engineering	\$25,000
4 Dredge pond to provide additional storage capacity, 16K cu.	\$50,000
yd.=3000K gallons	
5 Controls, float switches	\$2,000
Contingency	\$27,000
Contingency	Total \$379,000

SUNK									0	UT YEARS
est:	0		Cost Ber	efits + Non-	Discounted	Cash Flow (L,000s)		Cost:	0
fit:	0		Cumul	ative NPV C	'alculated @	15% from	1999		Benefit:	0
V	1000	2000	2001	2002	2003	2004	2005	2006	2007	2008
Year:	1999	2000	2001	2002	2005	2004		1		
Cost:										
Benefit:		1		i						
Cum NPV:										
Year:	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Cost:	1									
Benefit:										
Cum NPV:										

PROJECT NAME

PROJECT ID

FY: 2001

R#: <u>0</u>

II. PROJECT ECONOMIC EVALUATION (continued)

		COST	ASSUMPTIONS -			
				S	ensitivity/Ra	nge
į		CL			Most	
	Cost Assumptions	<u>L/M/H</u>	Basis for Confidence Level (CL)	Low	<u>Probable</u>	<u>High</u>

BENEFIT ASSUMPTIONS

Sensitivity/Range

CL Most

Benefit Assumptions L/M/H Basis for Confidence Level (CL) Low Probable High

	CAPITAL PROJECT JUSTIFICA		<u> </u>		
<u> </u>	PROJECT NAME	. <u>F</u>	PROJECT ID		
				•	
		I I	FY: 2001	R#:	0

III. PROGRAM PLAN

IV. PROJECT COORDINATION

SHOULD THIS PROJECT BE LINKED TO ONE OR MORE OTHER PROJECTS?

Page 4 4/15/99

	ECT JUSTIFICATIO	JI FOICIA		PROJECT	' ID	
PROJECT NAME						
			FY:	2001	R#:	
REGULATORY ais Project is not a Requirement, Commitment, or Nuclear S	Safety, skip this page.)					
S PROJECT IS A						
SOURCE OF REQUIREMENT, COMMITM	ENT, NUCLEAR SAFE	TY (Provide :	specific re	ferences)		
			74			
						
WHAT IS THE PENALTY FOR NO	ON-COMPLIANCE (Fin	ancial. Legal	, Political	<u>?</u>		
WHAT IS THE FEMALET FOR IN					-	
DOES THIS PROJECT T	OTALLY RESOLVE T	HIS ISSUE	2		-	
ÆS: X		NO:	If NO requir), list other	project	S
			requi	Cu		
				- 44		
	-					
DOES THIS PROJECT	CT RESOLVE OTHER	ISSUES?				
		10:	X			
YES If YES, identify the issue(s)	•			*,+-0		
·						
THIS PROJECT M	UST BE FUNDED THE	S YEAR?				
		N	O :	X		
YES: If YES, Why?						
YES: If YES, Why?						
YES: If YES, Why?						
YES: If YES, Why? This project must be completed by:		oate)				

CAPITAL PROJECT JUSTIFICATION FORM PROJECT ID PROJECT NAME R#: FY: 2001 VI. BOARD / STRATEGIC WHO DIRECTED? WHEN? WHY (Tie to Strategic Directive)? THIS PROJECT MUST BE FUNDED THIS YEAR? NO: X If YES, Why? YES

This project must be completed by:

Page 6 4/15/99



March 17, 2000

Contacts:

HED - Clark Morris (423) 751-3214

Scott Sims (423) 717-2061

Fossil Engineering Services

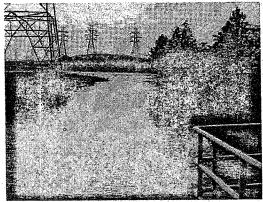
Mike Smith (423) 751-6226 Steve Weaver (423) 751-3536

REASON FOR IMPROVEMENT

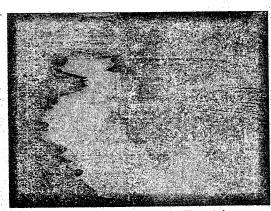
The new coal handling reclaim facility (under construction) flooded on April 29, 1999. The Coal Yard Runoff Pond is approximately 80% full of coal settlement, which leaves only 20% of storage capacity for rain runoff water. This excess drainage backs up onto the coal storage area

PROBLEM DEFINITION

The rain on 4/29/99, measured 1.75 inches in a 24 hour period. The potential for this magnitude of rain is on average 4.75 times per year, based on historical rain data.



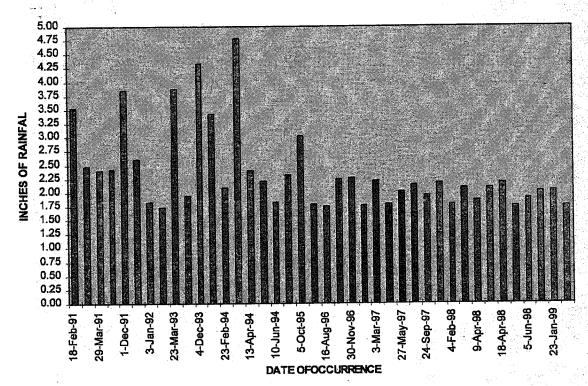
(Picture of Coal Yard Runoff Pond After Rain)



(Same Pond in Between Rain Events)

PROBLEM DEFINITION-CONTINUED

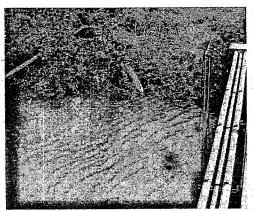
Kingston Significant Rain Data							
Date of	Inches of Rain	Date of	Inches of Rain				
Occurrence	in 24 hrs	Occurrence	in 24 hrs				
18-Feb-91	3.53	16-Aug-96	1.75				
3-Mar-91	2.48	8-Nov-96	2.25				
29-Mar-91	2.40	30-Nov-96	2.27				
22-Nov-91	2.42	24-Jan-97	1.76				
1-Dec-91	3.85	3-Mar-97	2.21				
2-Dec-91	2.60	26-May-97	1.79				
3-Jan-92	1.83	27-May-97	2.01				
4-Oct-92	1.74	14-Jun-97	2.13				
23-Mar-93	3.87	24-Sep-97	1.95				
6-Aug-93	1.94	26-Oct-97	2.18				
4-Dec-93	4.32	4-Feb-98	1.78				
11-Feb-94	3.42	8-Mar-98	2.09				
23-Feb-94	2.08	9-Apr-98	1.85				
27-Mar-94	4.78	17-Apr-98	2.08				
13-Apr-94	2.41	18-Apr-98	2.17				
26-May-94	2.20	26-May-98	1.75				
10-Jun-94	1.82	5-Jun-98	1.89				
16-Jul-94	2.32	23-Jul-98	2.01				
5-Oct-95	3.02	23-Jan-99	2.03				
9-Jun-96	1.79	29-Apr-99	1.75				
		i de la companya de	14 (1 day 1 day				

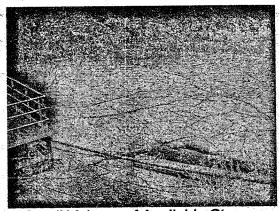


(Daily Rain Measurements by TVA, Sorted To Include Only 1.75" / 24 Hr. Rains)

ANALYSIS

- 1. Over the years heavy rain falls have washed fine particles of coal from the Coal Storage Yard into the Coal Yard Runoff Pond which has deceased the storage capacity of the pond to about 20% of the original volume.
- 2. In addition to the heavy rains, only one of the two existing pumps can be operated at a time, thus not allowing the pumps to keep up with the runoff. Only one pump can operate at a time due to the following reasons:
 - Deteriorated Fiberglass Discharge Piping can not handle the increased pressure of both pumps operating simultaneously:
 - Fiberglass Pipe has <u>now</u> been permanently severed for construction of new railroad loop track to the rail hopper, and is no longer usable.
 - Presently the existing Pumps are connected to the temporary diesel pump discharge piping. The purpose of the temporary pump is to assist in keeping the Reclaim Facility Construction Site dry.
 - The temporary diesel pump is scheduled to be removed once construction is complete. (Fall of calendar year 2000)
- 3. The Coal Yard Runoff Pump Controls no longer work and the pumps must be manually turned on and off.
- 4. Pumps' Electrical Power Feed is:
 - Deteriorated beyond repair,
 - Unreliable,
 - Only one pump can be operated at a time.





(Pictures Are Attempting to Show Relative Small Volume of Available Storage Capacity)

SOLUTIONS

1. Install a new 10" HDPE discharge pipe from pumps to ash pond (4200 ft.), sleeve under railroad tracks and main plant road.

2. Install a new power feed from new electrical equipment room through new reclaim tunnel, and a direct burial armored cable from end of tunnel to the pumps. Cable will be buried 5 feet deep and sleeved at road crossings.

3. Dredge pond to original storage capacity and enlarge if possible.

4. Install pump float switches for auto start/stop.

Proj	ected	Cost o	f Solut	ion

1.	Replace the pur ash pond with H	p discharge piping	from the floating	ng platform to the	3.3	\$150,000
2.		ctrical feed through	the reclaim tun	nnel to the floating	3 3	\$125,000
	platform.					3. 3. a.
3.	Dredge pond to	provide additional s	torage capacity	, 16K cu. Yd		\$50,000
	Controls, float s			en e	•	\$2,000
	Engineering				. 4	\$25,000
	Contingency	•	****			\$27,000
	TOTAL				. •	\$379,000

OTHER OPTIONS CONSIDERED

Do Nothing Option

The status quo should not be considered. Flooding of the new reclaim tunnels will shut off the supply of coal until the water and coal can be pumped out, and the new motors, variable speed drive electronic circuitry, belt scales, limit switches as well as damaged gear reducers, conveyor belt idlers, bearings, etc. are dried, cleaned inspected repaired and/or replaced, resulting in emergency hauling of coal, and possible derating of all 10 units.

Projected Cost of Do Nothing Option

Roberts & Schaefer (R&S) estimates damages at approximately \$3,000,000 for the above worst case scenario. Also, this does not include additional costs associated with emergency coal handling operations while the reclaim facility is being restored.

 Downtime of the reclaim and unloader facilities is estimated to be from at least 8 to 12 weeks just to return to a limited operation. In order to keep the plant on line, an interim coal handling operation would be necessary during the downtime. We estimate additional coal handling costs would range from \$330,000 to \$500,000.

OTHER OPTIONS CONSIDERED- CONTINUED

Status Quo Option

The rental of a portable diesel pump is an alternative considered in this evaluation. Based on the historical rain data, the diesel pump and discharge piping will need to be rented 5 times per year. The costs associated with this are as follows:

Rent Portable Diesel Pump		\$25,200
Fuel Costs for Pump		\$3,000
• Laborer to Fuel, Operate & Maintain	Pump	\$3,000
Rent Discharge Pipe		\$1,200
Dredge Portion of Pond		<u>\$10,000</u>
Total	Annual Costs	\$42,200

KINGSTON FOSSIL PLANT COAL YARD RUNOFF POND PIPING UPGRADE

March 17, 2000

Contacts:

HED - Clark Morris

(423) 751-3214

Scott Sims

(423) 717-2061

Fossil Engineering Services

Mike Smith

(423) 751-6226

Steve Weaver

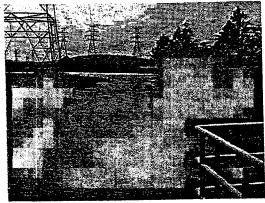
(423) 751-3536

REASON FOR IMPROVEMENT

The new coal handling reclaim facility (under construction) flooded on April 29, 1999. The Coal Yard Runoff Pond is approximately 80% full of coal settlement, which leaves only 20% of storage capacity for rain runoff water. This excess drainage backs up onto the coal storage area

PROBLEMBEANTON

The rain on 4/29/99, measured 1.75 inches in a 24 hour period. The potential for this magnitude of rain is on average 4.75 times per year, based on historical rain data.



(Picture of Coal Yard Runoff Pond After Rain)

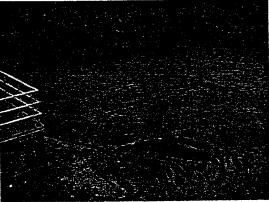


(Same Pond in Between Rain Events)

ANALYSIS

- 1. Over the years heavy rain falls have washed fine particles of coal from the Coal Storage Yard into the Coal Yard Runoff Pond which has deceased the storage capacity of the pond to about 20% of the original volume.
- 2. In addition to the heavy rains, only one of the two existing pumps can be operated at a time, thus not allowing the pumps to keep up with the runoff. Only one pump can operate at a time due to the following reasons:
 - Deteriorated Fiberglass Discharge Piping can not handle the increased pressure of both pumps operating simultaneously:
 - Fiberglass Pipe has now been permanently severed for construction of new railroad loop track to the rail hopper, and is no longer usable.
 - Presently the existing Pumps are connected to the temporary diesel pump discharge piping. The purpose of the temporary pump is to assist in keeping the Reclaim Facility Construction Site dry.
 - The temporary diesel pump is scheduled to be removed once construction is complete. (Fall of calendar year 2000)
- 3. The Coal Yard Runoff Pump Controls no longer work and the pumps must be manually turned on and off.
- 4. Pumps' Electrical Power Feed is:
 - Deteriorated beyond repair,
 - Unreliable,
 - Only one pump can be operated at a time.





(Pictures Are Attempting to Show Relative Small Volume of Available Storage Capacity)

SOLUTIONS

- 1. Install a new 10" HDPE discharge pipe from pumps to ash pond (4200 ft.), sleeve under railroad tracks and main plant road.
- 2. Install a new power feed from new electrical equipment room through new reclaim tunnel, and a direct burial armored cable from end of tunnel to the pumps. Cable will be buried 5 feet deep and sleeved at road crossings.
- 3. Dredge pond to original storage capacity and enlarge if possible.
- 4. Install pump float switches for auto start/stop.

Pr	ojected Cost of Solution	
1.	Replace the pump discharge piping from the floating platform to the	\$150,000
	ash pond with HDPE piping	#125 A00
2.	Install a new electrical feed through the reclaim tunnel to the floating	\$125,000 -
	platform.	650.000
3.	Dredge pond to provide additional storage capacity, 16K cu. Yd	\$50,000
	Controls, float switches	\$2,000
۲.	Engineering	\$25,000
٥.		\$27,000-
6.	Contingency	
	TOTAL.	\$379,000

OTHER OPTIONS CONSIDERED

Do Nothing Option

The status quo should not be considered. Flooding of the new reclaim tunnels will shut off the supply of coal until the water and coal can be pumped out, and the new motors, variable speed drive electronic circuitry, belt scales, limit switches as well as damaged gear reducers, conveyor belt idlers, bearings, etc. are dried, cleaned inspected repaired and/or replaced, resulting in emergency hauling of coal, and possible derating of all 10 units.

Projected Cost of Do Nothing Option

- Roberts & Schaefer (R&S) estimates damages at approximately \$3,000,000 for the above worst case scenario. Also, this does not include additional costs associated with emergency coal handling operations while the reclaim facility is being restored.
- Downtime of the reclaim and unloader facilities is estimated to be from at least 8 to 12 weeks just to return to a limited operation. In order to keep the plant on line, an interim coal handling operation would be necessary during the downtime. We estimate additional coal handling costs would range from \$330,000 to \$500,000.

OTHER OPTIONS CONSIDERED- CONTINUED

Status Quo Option

The rental of a portable diesel pump is an alternative considered in this evaluation. Based on the historical rain data, the diesel pump and discharge piping will need to be rented 5 times per year. The costs associated with this are as follows:

•	Rent Portable Diesel Pump	\$25,200
	Fuel Costs for Pump	\$3,000
	Laborer to Fuel, Operate & Maintain Pump	\$3,000
	Rent Discharge Pipe	\$1,200
	Dredge Portion of Pond	<u>\$10,000</u>
•	Total Annual Costs	\$42,200

PROJECT NAME

NGSTON FOSSIL PLANT - COAL YARD RUNOFF POND - PIPING UPGRADE

PROJECT ID
KINGSTON

FY: 2001 R#:

0

I. PROJECT DESCRIPTION

PROJECT LOCATION / CSC:

ORGANIZATION

OWNER

<u>LEAD</u>

FPG

KINGSTON

TECHNICAL CONTACT

NAME: STEVE WEAVER

PHONE: (423) 751-3536 .

LOCATION: LP 2T-C

SPONSORED BY

NAME: SCOTT SIMS

PHONE: (423) 717-2061

LOCATION: KINGSTON

PROJECT CATEGORY

Economic & Regulatory

(ECONOMIC, CUSTOMER, REGULATORY, BOARD, BLANKET)

REASON FOR IMPROVEMENT (Consequences of not doing)

Coal yard drainage basin overflows its' banks during moderate rains of 1.75 inches/24 hrs. The water flows onto the coal storage area which will fill up the new underground coal live pile reclaim structure (under construction). The potential for this magnitude of rain is on average 4.75 times per year, based on historical rain data.

PROBLEM DEFINITION

settlement has reduced the capacity of the drainage basin (pond) by at least 80%. Only one of the two pumps can be operated at a time due to deteriorated discharge piping. Pump must be manually turned on/off. The electrical power feed is deteriorated beyond repair. Flooding the new reclaim tunnels will shut off the supply of coal until it can be pumped out, and the new motors, variable speed drive electronic circuitry, belt scales, limit switches are dried, cleaned inspected repaired and/or replaced, resulting in emergency hauling of coal by pan scrapers to the rotary car dumper, and possible derating of all 10 units, if nothing is done (status quo).

PROJECT SCOPE

Dredge pond to original storage capacity and enlarge if possible. Install a new 10" HDPE discharge pipe from pumps to ash pond (4200 ft.), sleeve under railroad tracks and plant road. Install pump float switches for auto start/stop. Install a new power feed from new electrical equipment room through new reclaim tunnel, and a direct burial armored cable from end of tunnel to the pumps. Cable will be buried 5 feet deep and sleeved at road crossings.

IMPACT OF DELAY TO NEXT AVAILABLE IMPLEMENTATION WINDOW

Possible derating of all 10 units at KIF

HOW WILL THE ACHIEVEMENT OF CLAIMED BENEFITS BE MEASURED FOR THIS PROJECT?

No disruption to the new coal reclaim facility operation from potential flooding from runoff pond overflow.

No derating of units resulting from flooding of new reclaim facility.

Avoid additional coal handling costs associated with flooding of new reclaim facility.

4. No environmental impacts (REE'S) of pond overflow into river

Page 1 4/15/99

PROJECT NAME

NGSTON FOSSIL PLANT - COAL YARD RUNOFF POND - PIPING UPGRADE

PROJECT ID

FY: 2000 **R#**: <u>0</u>

II. PROJECT ECONOMIC EVALUATION

PROJECT COST

PROJECT ECONOMIC INDICATORS

	Thousands of Dollars
SUNK COST:	\$0
REMAINING COST:	\$0
TOTAL COST:	\$379,000
	(includes
	contingency)
CONTINGENCY:	\$27,000
FORECAST:	30

	NPV:	@15%		IRR:	%
	PI:	@ 15%		PAYBACK:	yrs.
-			-		
1					
1					
				•	

PROJECT CASH FLOW

Costs: FY2001	
This project consists of the following:	
1 Replace the pump discharge piping from the floating platform to the ash pond with	\$150,000
HDPE piping	*****
2 Install a new electrical feed through the reclaim tunnel to the	\$125,000
floating platform.	## A A A A A A A A A A A A A A A A A A
3 Engineering	\$25,000
4 Dredge pond to provide additional storage capacity, 16K cu.	\$50,000
yd.=3000K gallons	
5 Controls, float switches	\$2,000
Contingency	*\$27,000
Contingono	Total \$379,000

SUNK			 							UT YEAR
est:	st: 0 Cost Benefits + Non-Discounted Cash Flow (1,000s)							Cost:	0	
fit: 0 Cumulative NPV Calculated @ 15% from 1999								Benefit:	0	
			1 222	1 2222	T 2002	2004	2005	2006	2007	2008
Year:	1999	2000	2001	2002	2003	2004	2005	2000	2007	2000
Cost:										
Benefit:										
Cum NPV:										
Year:	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Cost:										
Benefit:	ļ									
Cum NPV:	1									

PROJECT NAME

PROJECT ID

FY:

2001 **R#:**

II. PROJECT ECONOMIC EVALUATION (continued)

	COST	ASSUMPTIONS			
			S	ensitivity/Ra	nge
. •	CL			Most	
Cost Assumptions	<u>L/M/H</u>	Basis for Confidence Level (CL)	<u>Low</u>	<u>Probable</u>	<u>High</u>

BENEFIT ASSUMPTIONS

Sensitivity/Range

CL

1

Most

Benefit Assumptions

L/M/H Basis for Confidence Level (CL)

Low Probable

<u>High</u>

Page 3 4/15/99

CAPITAL PROJECT JUSTIFICATION FORM				
PROJECT NAME	PROJ	ECT ID		
	FY:	2001	R#:	0

III. PROGRAM PLAN

IV. PROJECT COORDINATION

SHOULD THIS PROJECT BE LINKED TO ONE OR MORE OTHER PROJECTS?

	CAPITAL PROJECT	JUSTIFICA	TION FOI	RM				
	PROJECT NAME				<u>P</u>	ROJECT	<u> </u>	4.
					FY:	2001	R#:	<u>0</u>
F. REGULATORY f this Project is not a Requirement, Contains PROJECT IS A	nmitment, or Nuclear Safet	y, skip this page.)						
SOURCE OF REQUIRE	MENT, COMMITMENT	, NUCLEAR SA	FETY (Prov	ide spec	cific refe	rences)		
3001101					40			1
					ههر			
			•	<u></u>				
WHAT IS THE	PENALTY FOR NON-C	OMPLIANCE	Financial, I	egal, Po	litical)?	·	•	
								1
DOES	THIS PROJECT TOTA	LLY RESOLV	E THIS ISS	SUE?			~	
YES: X			NO:		If NO, required	list other	project	S
	•							
	-							
	DES THIS PROJECT R	FSOLVE OTH	ER ISSUES	?				
<u> </u>	JES THIS PROJECT A	COOLITE CALL						
YES If YES, identify the issue	e(s)		NO:	X		****	~	
:								
• •								
		<u></u>						
	HIS PROJECT MUST	BE FUNDED T	HIS YEAR	?				İ
YES: If YES, Why?	THIS PROJECT MUST	BE FUNDED T	HIS YEAR	? NO:	[x		
	HIS PROJECT MUST	BE FUNDED I	HIS YEAR		[X		
	HIS PROJECT MUST	BE FUNDED I	HIS YEAR			x		
	THIS PROJECT MUST	BE FUNDED T	HIS YEAR			X		

TVA-00009862

PROJECT NAME		ï 🗀	PROJECT ID			
		FY:	2001	R#:		
I. BOARD / STRATEGIC						
WHO DIRECT	ED?					
WHEN?						
WHY (Tie to Strategi	c Directive)?					
••• ••			·			
		-		,		
•						
			•			
	part No.					
THIS PROJECT MUST BE F	UNDED THIS YEAR?					
YES If YES, Why?		NO:	X			
	_					
	.					
-						
	•					
	-					
This project must be completed by:		(Date)				
Page 6 4/15/99						