

DIRECT TESTIMONY OF
ROBERT M. McCUISTION

ON BEHALF OF HOUSTON LIGHTING & POWER COMPANY
RE TEXPIRG CONTENTION 1/STP 3 VS. AC 1

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RE STP 3 VS. AC 1

1
2 Q. Please state your name and position.

3 A. My name is Robert M. McCuistion. I am the Vice
4 President for Power Systems Development of Houston Lighting
5 & Power Company.

6 Q. Please describe your educational background.

7 A. I hold a Bachelor of Science degree in Electrical
8 Engineering from The University of Texas, which I received
9 in 1942.

10 Q. Are you a Licensed Professional Engineer?

11 A. Yes. I am a Licensed Professional Engineer in the
12 State of Texas.

13 Q. Are you a member of any professional organiza-
14 tions?

15 A. Yes. I am a member of the National Society of
16 Professional Engineers, the Engineers Joint Council, the
17 Institute of Electrical and Electronic Engineers, the Na-
18 tional Water Resources Association and the Texas Water
19 Conservation Association.

20 Q. Please describe your employment experience.

21 A. I began my employment with HL&P in 1946. I worked
22 in various engineering jobs in the Company and in May, 1971
23 I became the Vice President of Engineering. I held this
24 position until I assumed the duties of Vice President, Power
Systems Development, in February, 1980.

1 Q. What are your present responsibilities?

2 A. I am responsible for power plant siting, and the
3 location of power plant sites for Houston Lighting & Power
4 Company's new power plants.
5

6 Q. Is this a new area of responsibility for you?

7 A. No. Power plant siting has been one of my areas
8 of responsibility for several years. In fact, I was in
9 charge of the Company's site evaluation process at the time
10 we selected both the STP site and the Allens Creek site. It
11 was my view then and now that both of these sites are ex-
12 cellent sites for the location of nuclear plants.

13 Q. What is the purpose of your testimony?

14 A. The purpose of my testimony is to address TexPirg
15 Contention 1, which is as follows:

16 "The South Texas site is an obviously superior
17 alternative to the Allens Creek site because:

- 18 a. South Texas is already the location of two nuclear
19 plants which are currently under construction and
20 disturbing an unspoiled site is not justified;
- 21 b. the cooling lake at South Texas is large enough to
22 accommodate one more unit such as the proposed
23 Allens Creek facility;
- 24 c. constructing another nuclear facility at South
Texas would involve significantly less land use
than constructing the proposed facility at the
Allens Creek site;
- d. construction of an additional facility at South
Texas will involve the use of significantly less
water than will the proposed facility.

1
2 Consumptive water use is a critical issue in
3 Texas; indeed, the Legislature has required that
4 ground water users in the Houston area convert to
5 surface water to reduce subsidence, which is a
6 major problem in this area;

7 e. construction of an additional facility at South
8 Texas would require less use of additional land
9 for transmission lines than would the proposed
10 facility; and

11 f. the population density in the vicinity of the
12 South Texas site is and will in the future be
13 significantly less than that in the vicinity of
14 the proposed facility. The residual risk to the
15 public from operation of an additional facility at
16 South Texas would therefore be less than that
17 associated with the operation of a facility at the
18 proposed site.

19 I will be assisted in this task by a panel of witnesses who
20 have addressed various parts of this contention. Subpart
21 (a) of TexPirg's contention is correct insofar as it asserts
22 that there are two nuclear units under construction; however,
23 as I will describe later, TexPirg is incorrect in assuming
24 that the Allens Creek site will remain undisturbed even if
ACNGS Unit 1 were moved to STP. I will also testify that
TexPirg's contention is premised on the erroneous assumption
that we have a contractual right to construct a third unit
at STP. Subpart (b) is correct but I will explain that
there is no assurance that we can obtain additional water to
operate a third unit at STP. As to subpart (c) of the
contention, Mr. Hussey will explain that preemption of the
land at the Allens Creek site is not environmentally

1 significant. Mr. Finley and Mr. VanSickle will address
2 subpart (d) -- Mr. Finley's testimony establishes that the
3 Allens Creek project will not adversely impact water supplies
4 in the Brazos River basin, and Mr. VanSickle will testify
5 that the City of Houston has no plans to import water from
6 the Brazos River. I will address subpart (e). Subpart (f)
7 will be addressed by Mr. White, who will provide current
8 population estimates for the area around the Allens Creek
9 site. Dr. Hamilton will address the comparative risks to
10 the surrounding populations from accidents at either site.
11 The testimony presented on subpart (f) will also cover
12 Bishop Contention No. 1. Mr. Schoenberger will appear on
13 the same panel and will address Hinderstein Contention No. 5
14 dealing with coastal sites.

15 Q. Taking these points in order, is it correct to
16 assume that if ACNGS Unit 1 were to be moved to the STP site
17 there would be no disruption of the Allens Creek site?

18 A. No, it is not. We would still plan to use the
19 site for construction of a power plant.

20 Q. Would you please explain the basis for your last
21 answer?

22 A. The Allens Creek site is one of the highly desir-
23 able sites in or near our service area, and it is now avail-
24 able to the Company for construction of new generating

1 capacity. I believe that the Company would construct other
2 facilities at that site. The reasons for this are obvious.
3 First, the Company owns all of the site. It is a significant
4 task to acquire a site this large and the fact that the
5 Company already owns the site would weigh heavily in favor
6 of its use for another power plant. Second, the Company has
7 a contract for a water supply from storage reservoirs in the
8 Brazos River Basin for development of future power plants
9 along the Brazos River. This supply is not contingent upon
10 any particular kind of power plant being constructed at the
11 Allens Creek site. Third, the site has been extensively
12 reviewed from an environmental standpoint and there are no
13 inherent difficulties with siting a plant at that location.
14 Fourth, the site is ideally located for purposes of trans-
15 portation routes both from the standpoint of railway and
16 highway access.

17 Q. Does HL&P have a contractual right to construct
18 its own unit at the STP site?

19 A. HL&P does not have a contractual right to con-
20 struct an individually-owned nuclear unit at the STP site.
21 Under the terms of the STP Participation Agreement, no
22 single participant has the right to construct its own
23 individual unit at the STP site. The contractual provision
24 reflects the fact that the STP site was chosen with a view

1 toward the proximity of the site to the respective major
2 load centers of the STP Participants, those areas being in
3 and around Houston, Austin, San Antonio and Corpus Christi.
4 This centralized location makes the site highly desirable
5 for expansion to accommodate future joint plants, and in
6 contemplation of that value, the STP Participation Agreement
7 defines the rights of the parties with respect to the loca-
8 tion of future units. Neither HL&P nor any other Participant
9 has the right to build a third unit at the South Texas
10 Project site except in conjunction with one or more of the
11 existing Participants and unless the two or more Participants
12 desiring to build the unit own in excess of a 50% interest
13 in Units 1 and 2. If two participants owning in excess of a
14 50% interest go forward with plans for a third unit, then
15 each Participant is entitled to participate up to its present
16 interest in a third unit, and if one or two Participants
17 having less than a 50% interest do not participate, those
18 choosing to join in the construction of the third unit have
19 the right to share the portion of the third unit attributable
20 to the interest of any Participant not joining. Units 1 and
21 2 are owned by the Participants in the following undivided
22 shares:
23
24

1		
2	City of San Antonio, Texas, acting	
3	through the City Public Service	
4	Board of San Antonio (CPSB)	28.0%
5	Central Power and Light Company	
6	(CPL)	25.2%
7	Houston Lighting & Power Company	
8	(HL&P)	30.8%
9	City of Austin, Texas (COA)	16.0%

10 Accordingly, if HL&P proposed to construct a third unit at
 11 the South Texas Project site, it could do so only if CPSB or
 12 CPL joined, and it would have no assurance that it would be
 13 entitled to more than a 30.8% interest in the unit and the
 14 power generated thereby.

15 Q. How does this contract affect your ability to pro-
 16 ject how much power you could obtain from a third unit at
 17 STP?

18 A. It makes any projection speculative. The deter-
 19 mination of our percentage entitlement could not be made
 20 until we had gone through the process of starting the plan-
 21 ning of a third unit and soliciting participation. This
 22 means we could only plan with assurance on obtaining 370 MW
 23 out of a third unit as compared with 1200 MW for the Allens
 24 Creek project. Stated differently, HL&P is precluded by the
 terms of the STP Participation Agreement from constructing a
 third unit at the STP site with capacity equivalent to ACNGS

1 and fully committed to HL&P.

2 Q. Has TexPirg's contention been brought to the
3 attention of the other STP Participants?

4 A. Yes, it has. We thought they should be told about
5 the contention and our position on the contention.

6 Q. Have the other Participants advised HL&P as to
7 whether they agree with HL&P's interpretation of the Partici-
8 pation Agreement?

9 A. Yes, we have been advised through the STP Manage-
10 ment Committee. The Management Committee representatives of
11 the other Participants have all advised HL&P that they
12 construe the Participation Agreement as preventing HL&P from
13 building an individually owned unit at STP. Moreover, these
14 same representatives have advised us that they would not
15 recommend an amendment to the contract to permit us to build
16 our own unit at STP.

17 Q. Turning to subpart (a) of TexPirg's contention, is
18 the cooling lake at STP large enough to accommodate an
19 additional unit at STP?

20 A. The lake would be big enough if we had the water.
21 The size of the lake is not the critical factor. The critical
22 factor is being able to replenish the water that evaporates
23 from the lake in the cooling process.

1
2 Q. TexPirg has alleged that the size of the STP
3 cooling lake is attributable to the fact that it was
4 designed for four units. Is that allegation accurate?

5 A. No. The size of the lake was dictated by the
6 water availability in the Colorado River. We had to build
7 the lake to its present size in order to store enough run of
8 the river water for reliable operation of two units. Coin-
9 cidentally, the lake would accommodate four units if we had
10 enough fresh water from upstream reservoirs.

11 Q. Are you saying that additional water supplies
12 would be required if a third unit is built at STP?

13 A. Yes, I am. As described in Section S9.2 of the
14 FES Supplement, a third unit would increase water consump-
15 tion by about 18,000 acre feet per year. We would have to
16 obtain additional water supplies to replenish the reservoir
17 as a result of the additional water consumption that would
18 result with a third unit. We would have to obtain this
19 additional water supply from the Colorado River.

20 Q. Are the existing arrangements for water supply at
21 STP adequate for a third unit?

22 A. No. The existing arrangements for the STP cooling
23 water supply contemplate that a 102,000 acre-feet per year
24 appropriation from the Colorado River, under Permit No. 3233
issued by the Texas Water Rights Commission (TWRC) on
February 24, 1976, will be the basic source of supply. An

1 evaluation of this supply, based on a 23 year historical
2 pattern of river flows and allowing for all existing senior
3 rights, was used as the basis for both the appropriation and
4 the STP construction permits. This evaluation reflects that
5 in most years less than 102,000 acre-feet will be available
6 for diversion under Permit No. 3233. In fact, our study
7 shows that under the terms of the permit, the average annual
8 availability is only about 55,000 acre feet.

9 Q. What would be the effect of adding a third unit to
10 the lake?

11 A. Based on historical river flows, our evaluations
12 indicate that the water available for diversion under Permit
13 No. 3233, when stored in the 7,000 acre reservoir at the
14 South Texas Project site, will provide a dependable supply
15 for the operation of two units without annual releases from
16 upstream reservoirs. These same studies indicate that the
17 consumptive use of another 18,000 acre feet of water each
18 year would not be available; therefore, a fixed amount of
19 water each and every year from upstream reservoirs would be
20 necessary to provide a dependable supply for more than two
21 units.

22 Q. Do you have the right to take water from upstream
23 reservoirs every year?
24

1 A. The STP Participants have a contract with the
2 Lower Colorado River Authority (LCRA), owner and operator of
3 upstream reservoirs on the Colorado River above Austin,
4 Texas, to provide water from the LCRA reservoirs "necessary
5 for the normal operation and maintenance of the integrity of
6 [Units 1 and 2]". This contract does not call for specific
7 amounts of water from the LCRA reservoirs each year as would
8 be necessary if a third unit were located at STP. By contrast,
9 there is an ample supply of water from the existing storage
10 on the Brazos River and Brazos River water has been committed
11 to HL&P by contract for one or more units at the Allens
12 Creek site.

13 Q. Are you able to predict whether there may be
14 additional water available in the future from the Colorado
15 River or from the LCRA reservoirs?

16 A. No. The subject of water availability on the
17 Colorado River has been greatly complicated by two presently
18 pending legal proceedings. As a result of my involvement in
19 obtaining water supplies for HL&P's power plants I have
20 followed this litigation because of its potential impact on
21 water availability in the Colorado. Until there is a final
22 decision in those proceedings, there is not any way to
23 accurately assess whether there is an adequate water supply
24 for additional units at the STP site.

1 Q. Would you describe the two proceedings?

2 A. The first proceeding involves the adjudication of
3 water rights in the Colorado River under the Texas Water
4 Rights Adjudication Act (Section 11.301, et seq., of the
5 Texas Water Code). The outcome of this proceeding could
6 result in an increase in the water available under Permit
7 No. 3233; however, there has been no final determination on
8 this question by the Texas Water Commission (TWC), the
9 adjudicatory arm of the Texas Department of Water Resources
10 (TDWR). Any such determination is subject to an appeal to
11 the courts, and in light of the importance of this pro-
12 ceeding to the numerous water users on the Colorado River
13 there is a reasonable expectation of one or more such appeals.

14 The second proceeding involves an application for Stacy
15 Reservoir, a proposed reservoir on the upper reaches of the
16 Colorado River with planned capacity of about 550,000 acre-feet
17 of water. This application was granted by the TWC. The
18 LCRA protested this new reservoir before the TWC, asserting
19 that the new reservoir would significantly decrease the
20 yield of the LCRA's reservoirs near Austin, Texas. If LCRA
21 is correct, there is a serious question as to whether we
22 could obtain additional water from LCRA reservoirs. LCRA,
23 the City of Austin, which relies on the Colorado River for
24 its municipal water supply, and others have appealed the TWC

1 decision. The matter is now pending before an intermediate
2 appellate court of the State of Texas. In short, absent
3 final resolution of either or both of these legal proceedings,
4 which cannot be reasonably anticipated within the time frame
5 required for a decision on HL&P's proposed Allens Creek Unit
6 1, it is not possible to make an accurate assessment as to
7 whether there is additional water available for a third unit
8 at the South Texas Project site.

9 Q. Is salt water a feasible coolant for a third unit
10 at STP?

11 A. Theoretically we could use salt water for cooling
12 a third unit, but it would be very costly since we would
13 have to build intake and discharge pipes all the way to the
14 coast. We would not use the existing lake for storage and
15 cooling since STP Units 1 and 2 have been designed for
16 freshwater cooling. We would have to build either a new
17 cooling lake or a cooling tower depending on which proves to
18 be the best choice for the site. If you had to go the route
19 of salt water cooling then you are essentially comparing
20 Allens Creek with a virgin coastal site, because the largest
21 environmental impact associated with the construction of a
22 large power plant is its condenser cooling system. Since a
23 new system would be required to accommodate a third unit
24

1 cooled by salt water, we are in essence dealing with a new
2 site. As shown in Mr. Schoenberger's testimony, HL&P has
3 compared the Allens Creek site with coastal sites very near
4 STP and Allens Creek comes out quite favorably in such a
5 comparison.

6 Q. Looking now at subpart (e) of TexPirg's contention,
7 would additional transmission lines be required for a third
8 unit at STP?

9 A. Yes. We would have to build additional lines for
10 a third unit.

11 Q. How would these additional lines compare in length
12 to the Allens Creek transmission lines?

13 A. The lines for a third unit would probably follow
14 the now-constructed common corridor between the STP and the
15 Danevang Tie Point. This 18.9 mile long corridor would
16 require widening by 100 feet to accommodate the additional
17 lines. From Danevang, the lines would follow an existing
18 corridor in a northeast direction to the W. A. Parish sub-
19 station. This 48 mile long corridor would also require
20 widening by 100 feet to accommodate the additional lines.
21 The total length of these lines associated with a third unit
22 at STP is about 67 miles. The total length of the proposed
23 transmission lines from the Allens Creek site is about 65
24 miles. The total length of transmission lines for a unit at

1 either site is essentially the same. Although the corridors
2 for the Allens Creek lines would be the wider of the two,
3 the area of impact would be about the same for both lines.

4 Q. Is there any difference in impacts in present land
5 use?

6 A. No. Both projects are almost exclusively in rural
7 areas. Since we continue to allow farming and ranching on
8 our rural power line easements, the present use of the land
9 will continue under the lines associated with either site.
10 The only areas taken out of production would be the area at
11 the base of the towers. Since the lines would be virtually
12 the same length the number of towers should be about the
13 same. Thus, from a land use standpoint the impacts are
14 indistinguishable from one line to the other.

15 Q. Mr. McCuistion, would there be any cost or delay
16 involved in moving ACNGS Unit 1 to the STP site, if you
17 assume that it could be done?

18 A. Yes. There would be significant costs and delays.

19 Q. Please describe the delay problems.

20 A. First, you must take into consideration the fact
21 that HL&P has obtained or applied for nearly all of the
22 permits for Allens Creek required by state and federal
23 agencies. The complete status of our permits is described
24 in Chapter 12 of the Allens Creek Environmental Report and

1 Supplement. We have received permits from the Environmental
2 Protection Agency, the U. S. Army Corps of Engineers, the
3 Texas Water Rights Commission and the Texas Water Quality
4 Board. HL&P has also received a certificate of Convenience
5 and Necessity from the Public Utility Commission for the
6 Allens Creek Nuclear Generating Station and associated
7 transmission lines. HL&P has had consultations with ap-
8 proximately 15 other state agencies. NRC review has pro-
9 gressed to an advanced stage. Although one might expect
10 expedited review of an additional unit at the STP site,
11 additional NRC staff, ACRS and ASLB review of some significant
12 duration would be required and clearly the necessary approvals
13 would not be forthcoming within the time frame contemplated
14 for approval of the ACNGS. We would have to duplicate
15 much of the permitting effort at other state and federal
16 agencies. It would be difficult, if not impossible, to
17 prosecute all of these permits in two years or less.

18 Q. Would there be a cost penalty associated with
19 moving ACNGS Unit 1 to the STP site?

20 A. Yes. There would be three types of costs: (1)
21 invested costs that would be permanently lost; (2) additional
22 engineering and plant costs; and (3) the cost resulting from
23 delay in getting the plant into operation.

24 Q. What are the invested costs that would be perm-

1 anently lost?

2 A. HL&P has invested millions of dollars in site
3 studies, detailed engineering, legal fees, etc., virtually
4 all of which would be lost and would have to be duplicated
5 for location of any additional unit at STP, or anywhere
6 else. I estimate that these costs would be approximately
7 \$45 million.

8 Q. Have you made an evaluation of the increased
9 engineering and plant costs associated with the move?

10 A. Yes. That evaluation is shown on Applicant Exhibit
11 No. _____ (RMMc 1). As you can see the biggest cost saving
12 is the \$40,000,000 which results from elimination of the
13 Allens Creek reservoir. This assumes, of course, that we
14 could get additional fresh water for a third unit at STP.
15 One must assume that if we were forced to move ACNGS Unit 1
16 to the STP site the only sure source of cooling water at
17 this time would be salt water. Thus, it is more realistic
18 to assume that we would have to build a new salt water
19 cooling lake or a salt water cooling tower, and a water
20 conveyance system from the Gulf to STP. The \$250,000,000
21 cost for the conveyance system alone substantially exceeds
22 the \$40,000,000 "savings", and therefore the net cost is
23 really an additional cost penalty rather than a cost savings.

24 Q. What costs are associated with delays?

1 A. First, you have to make an estimate of the delay
2 involved. The additional engineering and site studies
3 required for location of ACNGS Unit 1 at STP would take two
4 years to prepare, at a minimum. At that point the project
5 would just be at the point in the licensing process that it
6 is now. Under this scenario it is impossible to get the
7 project on line by 1989. Each year that the project is
8 delayed beyond 1989 will cost at least \$500 million in
9 differential fuel costs alone. (See testimony of Dr. Guy).
10 If one assumes that we have a two year delay (i.e. to 1991)
11 in order to make the transition, the fuel cost differential
12 would be at least \$1,000,000,000. Escalation would add
13 another \$100 million per year, or \$200 million for two
14 years.

15 Q. What would be the total cost associated with
16 moving ACNGS Unit 1 to the STP site?

17 A. The total cost associated with moving ACNGS to STP
18 would be about \$1.3 billion, assuming: (1) only a two year
19 delay; and (2) use of fresh water at STP. If we had to use
20 salt water for the third unit the cost penalty would be
21 increased substantially. Moreover, the differential fuel
22 costs and escalation would continue to escalate for each
23 additional year of delay beyond two years. In short, there
24 are severe cost penalties associated with moving ACNGS

1 to STP.

2 Q. Does that conclude your testimony?

3 A. Yes.

<u>Detail of Items</u>	<u>If ACNGS Is Moved To STP Site</u>	
	<u>Costs Saved</u> ^{a/}	<u>Costs Incurred</u> ^{a/}
1. Site improvements (assume 2/3 of AC cost for drainage, roads, grading saved)	\$3,616,000 ^{c/}	\$1,205,000 ^{d/}
2. Circulating water discharge canal (not needed at STP)	1,665,000 ^{c/}	0
3. Concrete (10-20% more concrete required at STP due to soils)	-	7,750,000-15,000,000 ^{d/}
4. Redesign and enlarge HVAC system due to changes in chilled water system (increase AC cost 10-20%)		2,000,000-4,000,000 ^{d/}
5. Larger piping, hangers and valves required at STP (5-10% cost increase)	-	4,600,000-9,200,000 ^{d/}
6. Electrical (4 kv transformer for AC not needed at STP)	800,000 ^{c/}	
7. Redrafting of 200 completed AC drawings	-	6,450,000-9,400,000 ^{d/}
8. Engineering design (redesign 14 of 78 AC systems)		6,668,000 ^{d/}
9. Purchasing (rebid 25 of 242 AC specs)		200,000 ^{d/}
10. Additional studies (i.e., geotechnical hydrological; meteorological; seismic; ecological; radiological)		4,050,000 ^{c/}

<u>Item</u>	<u>Costs Saved</u> ^{a/} <u>c/</u>	<u>Costs Incurred</u> ^{a/} <u>e/</u>
I. Reservoir	\$40,000,000	\$ 0
A. UHS (construct embankment for STP-type UHS)	-	3,000,000
II. Construction		
A. Direct (Items 1-6)	6,081,000	15,555,000-29,405,000 ^{d/}
B. Indirect (management and supervision)	16,488,000- 30,588,000 ^{d/}	12,201,000-22,635,000 ^{d/}
III. Engineering and Services (Items 7-10)	-	17,368,000-20,318,000 ^{d/}
IV. Material Replacement ^{b/}		6,500,000 ^{c/}
V. Land taxes 1973-1980		476,000 ^{c/}
VI. Escalation for Two Years ^{g/}		200,000,000 ^{c/}
VII. Differential fuel costs for two years ^{g/}		1,000,000,000 ^{f/}
	62,569,000-76,669,000	1,255,100,000-1,282,334,000

Therefore the net cost of leaving ACNGS and moving to STP falls in the range of:

\$1,178,431,000-\$1,219,765,000

- a/ Costs were obtained from latest AC cost estimate and PMO judgment.
- b/ Replacement of equipment (condensor, tubes, etc.) due to design changes.
- c/ From latest AC cost estimate.
- d/ From AC PMO judgment.
- e/ From latest STP cost estimate.

- f/ From HL&P Corporate Planning Dept.
- g/ Two years required to return to present state of licensing.