HOUSTON LIGHTING & POWER COMPANY
P. O. Box 1700
Houston, Texas 77001

MAR 14 1983

G. W. Oprea, Jr.
Executive Vice President

March 11, 1983

Mr. John Collins
Nuclear Regulatory Commission
Region IV
611 Ryan Plaza Drive, Suite 1000
Arlington, Texas 76012

Dear Mr. Collins:

Per our telephone conversation this date, attached is the document to which I referred.

Very truly yours,

G W Oprea Jr

GWO/sra
Attachment

CANCELLATION OF THE

SOUTH TEXAS NUCLEAR PROJECT

A BRIEFING PAPER

The following briefing paper is a work in progress by the South Texas Cancellation Campaign (STCC). This paper is prepared for decision makers in an effort to provide an in depth view of the issues raised by continuation of the South Texas Nuclear Project. Much of the discussion focusses on Austin as the partner most active in trying to get out of STNP. The information and observations, however, are of equal application and importance to the other partners.

South Texas Cancellation Campaign

Summary argument: We are at a crossroads in the history of the South Texas Nuclear Project. The choice is between continuation and cancellation of the project. This Briefing Paper proposes that the most reasonable policy to adopt regarding STNP is cancellation of the project as quickly as possible.

The STNP partnership is in deep trouble. Austin voters authorized the sale of Austin's share of STNP in November 1981. After an extensive effort, Austin failed to find a utility interested in even discussing such a purchase.

Subsequently, Austin filed suit against Houston Industries and Houston Lighting and Power Company. The suit asks for a refund of Austin's investment to date in STNP and assumption by HL&P of Austin's 16% share of the project. HL&P cannot afford an adverse judgment in this suit. The refund of Austin's investment and the potential for an identical suit by the City of San Antonio and Central Power and Light threaten the economic viability of HL&P. Prior to trial in the Austin suit, HL&P would probably file for reorganization. Cancellation of STNP would probably follow shortly thereafter. Since trial is unlikely in the next year or even two years, hundreds of millions of dollars more will have been spent on STNP by the time of such a receivership.

To finish STNP will require a minimum additional expenditure of $3 billion dollars. This money will not be available to pursue other energy options, such as conservation, energy efficiency, and renewables. Even if finished, STNP is very likely to experience the problems generic to the nuclear industry -- accidents, constant breakdowns and repairs, discovery of new defects, and possible destruction as at Three Mile Island.

Throughout the operating life of STNP, there would be the danger of a catastrophic accident killing thousands of people, destroying great parts of the South Texas and Gulf of Mexico ecosystems, and causing billions of dollars in damages.

The choice is between the road requiring billions of dollars more to be spent on a dangerous and defective product and the road leading to an energy policy which respects human life, the planet, and our economic well-being.

To us the choice is obvious.

For further information, please contact:

Nina Butts 1508 W. 13th Austin, Texas 78703 (512) 476-9519	or	Lanny Sinkin 2207 D Nueces Austin, Texas 78705 (512) 478-3290

We would appreciate your comments and suggestions. If you would like to contribute to further the cancellation effort, please make checks payable to "STCC" and send to either of the addresses above. If you would like a full briefing book containing documents (the "attachments") which support and expand upon the information in this paper, send $10 to STCC with your request.

Historical Summary of the South Texas Nuclear Project

1973 - HL&P presents STNP as a two unit nuclear plant to cost between $738 and $990 million, to begin delivering electricity in 1980 (second unit 1982), and to be designed, engineered, and constructed by Brown and Root.

1978 - Reports begin to surface that inspectors are being beaten and intimidated at STNP and that construction practices are substandard.

1979 - Three Mile Island Unit 2 demonstrates that nuclear plants are not cheap, safe, or reliable.

1980 - The Nuclear Regulatory Commission issues an Order To Show Cause threatening to suspend all safety related construction at STNP. NRC investigators confirm that inspectors are being intimidated and that construction practices are substandard.

1981 - In a referendum, Austin voters authorize sale of Austin's share of STNP.

1981 - NRC licensing hearings begin. After 40 days of hearings, the record of more than 11,000 pages of testimony and more than 200 exhibits reveals a mismanaged, poorly constructed nuclear project.

1981 - NRC discovers Quadrex Report on deficiencies in STNP design and engineering. Brown and Root fired as architect-engineer. Brown and Root walks off project as builder. Partners sue Brown and Root.

1982 - The Public Utility Commission of Texas concludes that HL&P has mismanaged STNP, calls for removal of HL&P directors, and threatens not to allow HL&P to recover its investment up to the current projected price of $5.495 billion.

1982 - In answering the STNP partnership law suit against them, Brown and Root countersues HL&P and files hundreds of pages of allegations of gross mismanagement by HL&P.

1982 - The partners discuss cancelling Unit 2.

1983 - An extensive effort by Austin ends with no buyer found for Austin's share of STNP. Austin files suit against Houston Industries and Houston Lighting and Power.

1983 - The Sisters of the Sorrowful Mother, a religious order, files a stockholder's resolution calling for STNP to be shut down until an independent review can be conducted. The vote on the resolution will be on May 11 in Houston.

1983 - STNP is still a two unit nuclear power plant but the cost is now <u>at least</u> $5.495 billion, electricity will not be delivered before 1987, if then, and Brown and Root is no longer on the job.

The Options for the Partners

Continuation: There are certain facts which all but the most diehard proponents of STNP agree upon:

— the project is now seven years behind schedule;

— the project is now estimated to cost six to seven times the original price, depending on which original figure is used. (HL&P told San Antonio $738 million and told Austin $990 million);

— Brown and Root built the first third of the plant with inexperienced personnel and in a substandard manner. As just one indicator from the massive NRC licensing hearing record, in August 1979 a technical consultant (Ferguson) to HL&P sent a highly critical letter to Brown and Root (Dodd) which included the following statement:

> "Many people have been exposed to or a part of inadequate performance for so long it is now the norm." (Attachment 1)

— The Brown and Root design and engineering program was equally substandard. In May 1981, the Quadrex Corporation, an independent consultant, delivered a 500 page report to HL&P based on a sampling of Brown and Root's design and engineering work. The report contained 290 deficiencies in the Brown and Root process and included the following evaluation:

> "There was little evidence of a well-thought-out and consistent basis for design." (Review copy of Quadrex Report available upon request.)

Bechtel did an analysis of the Quadrex findings. The NRC recently concluded that Bechtel has corrected or will correct the deficiencies found by Quadrex. There is reason to question the Bechtel analysis since Bechtel is taking over the project and cannot be considered an independent reviewer. More importantly, the deficiencies should never have occurred in the first place nor remained undetected over a six year period.

— HL&P mismanaged STNP. HL&P did not fire Brown and Root as architect-engineer until late 1981. The firing came after the NRC discovered the Quadrex Report and demanded its release to the licensing board. The Public Utility Commission concluded in December 1982 that HL&P had mismanaged STNP. (See Attachment 2)

-- The same personnel at HL&P (Don Jordan, President and Chief Executive Officer, and George Oprea, Executive Vice President) who are responsible for HL&P's performance to date are still in place. In October 1980, HL&P hired Jerome Goldbberg, an experienced nuclear engineer, as Vice President of Nuclear Construction and Engineering. Mr. Goldberg brings an expertise which was sadly lacking between 1972 and 1980. Mr. Goldberg has been bluntly critical of the HL&P/Brown and Root history prior to his hiring. But, Mr. Goldberg has devoted his professional career to nuclear power and cannot be expected to be objective about the problems of the nuclear industry or about cancelling STNP. Unfortunately, his most striking decision to date was that the NRC did not need to see the Quadrex Report.

-- Utilities involved in nuclear plants are finding their bond ratings steadily lowered as their nuclear investment exposure increases. The bond market no longer responds favorably to nuclear plant investments.

-- The nuclear industry as a whole has experienced poor performance, numerous accidents, repeated discovery of new defects, constant repairs, and continued cost escalations and construction delays. The economics of nuclear plants are critically dependent on the reliability of electrical generation. Performance to date is far below the 80% capacity factor originally used to justify STNP economically. While the utilities now use 65%, the record indicates that large Westinghouse reactors can be expected to perform at closer to 50% to 55%. In addition, STNP is two 1250 megawatt reactors. There are no operating reactors that large in the United States. STNP is thus an experimental reactor by reason of its size at a time when the record predicts worse performance the larger the reactor.

There have been 167 accidents described by the NRC as precursors to core damage. The terminology means that in each of these accidents, the accident proceeded to the verge of damaging the reactor core, as happened at Three Mile Island.

Three Mile Island Unit 2 operated for only three months before destroying itself. The rate payers will pay more than $2 billion just to clean up the mess and $25 million per month for replacement power.

Citizens Concerned About Nuclear Power, the remaining intervenor in the STNP licensing hearings, receives three or four notices a month from the NRC detailing hardware not performing as required, defective materials supplied to reactors by vendors, possibilities for performance failures not previously discovered, and inadequacies in testing or analysis previously conducted. (Attachments 3 and 4 are recent examples.) There is a frightening detachment found both in the corporate suites and among the workers in the field from the very real dangers of nuclear power. Shoddy work, defective material, cheating, and other symptoms of this detachment are rampant throughout the industry.

The defective Westinghouse steam tube generators alone represent the largest single product failure in U.S. history. An essential part of the cooling system, these tubes corrode and release radioactive steam after only a few years of use. Such a unit is already installed in Unit 1 at STNP. An even more serious product failure is the reactor vessels, which become brittle after fifteen years of neutron bombardment, threatening to shatter if certain conditions arise.

-- Intervenors all over the country are beginning to compare notes on NRC performance. The conclusion is emerging that the NRC is not protecting public health and safety but rather is protecting the nuclear industry. There is evidence of NRC failure to detect ongoing deficiencies (inspectors being threatened and a disastrous design and engineering process at STNP as examples), suppression of negative investigative findings, falsification of investigative results, compromising investigations by changing draft reports to meet the objections of those under investigation, and much more. There is no guarantee that any nuclear plant in the country is adequately inspected, built, or operated. The absence of effective NRC oversight means that we will never be sure how safe STNP really is. Furthermore, under these circumstances, another Three Mile Island is a real possibility. A second such accident could well produce a national outrage resulting in shutting down even non-operating plants, like STNP.

If STNP is continued, these facts lead to certain predictions and conclusions, such as:

-- The chances of a further delay in the STNP schedule are high. HL&P is still managing the project. The NRC frequently changes regulations in response to new defects found in reactors. These changes often result in new requirements for reactors under construction and, consequently, in delays and cost increases for those reactors.

-- The cost will almost certainly go up. The current projection is roughly $2200/KW ($5.495 billion for 2500 MW). Nuclear plants being finished now are costing that much and more. (Shoreham's $3800/KW translates into $9.5 billion for STNP. See Attachment 5.) A realistic estimate for STNP is $7 to $8 billion. At this level, the partners would have to raise an <u>additional</u> $4.5 to $5.5 billion plus interest to finish STNP.

-- There is no guarantee that the errors made by Brown and Root will be corrected. HL&P's evaluation of the plant was not comprehensive following the Order to Show Cause. HL&P limited its evaluation to the areas in which the NRC had questions after the investigation producing the Order. Bechtel did no further evaluation of the physical plant in place.

-- The hiring of Bechtel is no guarantee of high quality performance. Bechtel's record at other nuclear plants is as bad as or worse than Brown and Root's record at STNP. (See Attachments 6 and 7.)

-- As a problem plant, STNP is more likely to have an accident, perform poorly, and need repairs than a well- built plant. Since even well-built plants face serious problems (brittle reactor vessels, defective steam tube generators, and dozens of other problems), STNP is double trouble.

-- Remembering that Three Mile Island Unit 2 came within 30 minutes to one hour of a complete core meltdown, the possibility of such a meltdown at STNP must be considered. The most current consultant report for the NRC projects that a meltdown and containment rupture of just one of the units at STNP would cause 18,000 immediate deaths; 10,000 injuries; 4,000 long term cancers; and $104 to $112 billion in damages. Essentially, the whole area of South Texas near STNP would be wiped out. The NRC study makes no estimate of the long term ecological effects on South Texas or the Gulf of Mexico.

-- The utilities in the midst of constructing nuclear power plants will face a continuing deterioration in the financial community's response to their investment needs. Lowered bond ratings, higher interest rates, declining investor interest in nuclear bonds, and even bankruptcy are the likely future for such utilities. The WPPSS cancellation of two nuclear reactors in Washington state is on the verge of becoming the largest bond default in U.S. history ($7 billion -- larger than New York City's debt when New York defaulted). The refusal of many of the 88 public and private utilities to pay for the cancelled plants provoked this crisis. The prospect of such a default is making Wall Street even more nervous about further nuclear investment.

By draining off huge amounts of investment capital, nuclear power plants are preventing the development and pursuit of other energy strategies.

Those utilities heavily committed to nuclear construction face lowered bond ratings and possible bankruptcy. The pending WPPSS default in Washington threatens unforeseeable economic consequences. Bankruptcy looms for many of the 88 public and private utilities involved in the project. The economies of the states where these utilities are located and even the national economy could experience devastating blows.

On the other hand, progressive utilities around the country are choosing to pursue conservation, efficiency, and use of renewables. These policies are developed and implemented through utility loans, changing building codes, energy-conscious architecture, technological improvements in energy-using appliances, and regulatory reform requiring changes in utility policies. (See Attachment 8.)

The $3 to $5 billion needed to finish STNP could be spent on conservation, energy efficiency, and renewable technologies. Since these strategies provide a megawatt of energy at roughly one fourth the cost of STNP, far less money will have to be spent to meet energy needs. The remaining resources will be freed to meet other community needs. To invest in the alternative strategy is simply common sense.

Default: Default is really a misnomer because if a partner were to stop making payments to STNP, that partner would not lose its existing investment. Instead, the non-paying partner would lose certain rights under the contract.

Under the Participation Agreement, a partner can ask for arbitration of claims where such partner believes it has a legitimate right to be reimbursed for costs charged by HL&P, the managing partner. If a partner sought arbitration, that partner and each of the other partners would have the right to pick an arbitrator with all arbitrators choosing a fifth arbitrator. But the right to select an arbitrator exists only so long as the requesting partner has a 15% share of the project. If a partner stopped paying and its share dropped below 15%, only the other partners would select arbitrators.

Furthermore, once a partner went below 15%, the other partners would have the right of first refusal on that partner's share until completion of the project. This means that the non-paying partner could not independently sell its share until the project was complete and the other partners had refused to buy out the non-paying partner.

More seriously, the bond raters (Moody's and Standard and Poor) have threatened to remove Austin's bond rating altogether if Austin stops payments to STNP. They argue that as long as Austin has a valid contract to make payments to STNP, Austin would be breaching its obligation and repudiating a promise to pay. Since bonds are similarly no more than Austin's promise to pay, such a breach would be perceived by the bond raters as threatening the possible breach of Austin's bond promises as well.

The bond raters also argue that if Austin stopped making payments to STNP, the project might well collapse. The other partners might then sue Austin for the value of the project and for the cost of returning the land at the project site to its original condition -- potentially a multi-billion dollar judgment against Austin.

For these reasons, if Austin defaulted, the bond raters would refuse to recommend that their investors purchase any further bonds from Austin. Should the bond raters follow through on such a threat, Austin might be forced to cash-up-front payments for all purchases and capital improvements.

Any partner considering unilateral cessation of payments would face the same threat. While there is historical evidence such a threat would not be carried out, default is not a viable option at this time.

Litigation: There are presently two law suits over STNP involving some or all of the partners. All four partners are suing Brown and Root for "poor performance." Brown and Root has countersued charging HL&P with gross mismanagement and incompetence. There is a good chance that Brown and Root can make a good enough case to at least in part defeat the suit.

Austin filed suit against HL&P in January 1983. Austin alleged that HL&P misrepresented Brown and Root's capabilities when HL&P originally proposed that Austin join the STNP partnership. The suit also alleges that HL&P mismanaged the project over the last eight years. (See Attachment 9, exhibits omitted.)
Austin seeks a reformation of the contract requiring HL&P to refund Austin's investment to date (more than $400 million) and assume Austin's 16% payments.

Austin has an excellent suit. The record of Brown and Root's performance is riddled with incompetence. HL&P's management to date is equally flawed.

Obviously, Austin would prefer recovering its investment, as the law suit seeks to achieve. A successful cancellation campaign might foreclose that option since HL&P would probably ask for a no-litigation pledge as part of a cancellation agreement among the partners.

But the suit, as with any litigation, is not a sure win. The greatest weakness is that Austin participated continuously on the management commitee for STNP. While there is evidence that HL&P withheld significant information from the management committee, there was publicly available information which should have put Austin on notice that the project was in trouble. The NRC Order to Show Cause in April 1980 and the NRC licensing hearing record developed since May 1981 documented the problems extensively and publicly. Despite these indicators, Austin took no action to change management until Austin belatedly requested a share in the project management in 1982. (HL&P refused the request.)

The litigation could easily take years. Austin would have to continue its $5 to $6 million per month payments and litigation fees (already well over $1 million). Austin could pursue the litigation to an ultimate resolution and come up empty handed.

Should Austin be successful, San Antonio and Central Power and Light would stand an excellent chance of winning a similar suit. To date, neither San Antonio nor CP&L has joined in the Austin litigation.

If all the partners sue and win, HL&P may become insolvent or seek reorganization protection. (In fact, if the Austin law suit actually reached the trial stage, HL&P would probably file for reorganization before trial rather than risk losing.) The partners would receive either nothing or pennies on the dollar. In addition, the people of Houston would experience a painful and chaotic crisis in a situation where they had no effective control over HL&P in the first place.

Selling: Austin has done everything possible to sell its share of STNP since Austin voters authorized selling in November 1981. Despite highly qualified assistance by consultants, a very attractive sales offer (including easy terms), and approaches to 21 utilities, these efforts have failed. While sales approaches did not begin until September 1982, after Bechtel gave their new cost estimate, the lack of any positive response is already clear.

There are no buyers because there is no confidence in STNP, nuclear power plants, or Bechtel cost estimates. Even if Austin sold its share, the Participation Agreement requires Austin to be responsible for the performance of any buyer unless the partners free Austin of that obligation -- an unlikely occurence. Austin would still face the prospect of the buyer defaulting, forcing Austin back into the project. Assuming Austin had committed itself to other energy strategies in the meantime, Austin would face the prospect of a huge unforseen obligation for which there would be no energy or economic justification. Any other partner faces the same selling situation.

There is also the immorality of selling a poorly built, defective, and, therefore, dangerous plant to some other city or private utility.

Finally, it is generally agreed that HL&P is the only possible buyer. But HL&P just faced a hostile Public Utility Commission which threatened not to let HL&P recover its share of the current estimated cost of the project. While the NRC has never denied an operating license to a reactor, it is conceivable that even the NRC will find HL&P's performance intolerable. HL&P also knows that if HL&P buys out Austin, San Antonio will also want at least half of San Antonio's share to be purchased.In such a climate of uncertainty, HL&P has no interest in increasing its potential liability for STNP and rejected any further discussions of purchase in a terse letter to Austin in December 1982.

It is possible that an aggressive cancellation campaign by the City of Austin would be perceived as so threatening that HL&P would want to buy Austin out, but the reality seems to be that HL&P cannot afford to do so and, faced with a highly uncertain regulatory climate, has significant incentives not to do so.

HL&P's recent propaganda barrage about STNP being "back on track" and "turned around" is merely HL&P's effort to convince everyone to forget the history of the last ten years at STNP and of the nuclear industry in general. HL&P is also anxious to prevent the growing consensus for cancellation.

At the same time, HL&P really has more incentives to cancel STNP than any partner. The project is an albatross around HL&P's neck.

<u>Cancellation</u>: The harsh reality is that over the past two decades, nuclear power plants have proven themselves to be unreliable, dangerous, and astronomically expensive. A clear indicator of nuclear plant viability as an energy option is the response of utilities to the recent history of this product. At the time of the Three Mile Island accident, there were 20 applications pending for nuclear plant construction licenses. One of these was the Clinch River Breeder Reactor, a pet project of certain Congressional representatives, not a utility project. Of the other 19 applications, all 19 have been cancelled, including HL&P's Allens Creek project. Allens Creek was originally to be a two reactor plant. HL&P cancelled one of the units in the early stages of planning and then cancelled the second unit in 1982 for a total loss of $388 million, before a construction permit was even granted. (See also Attachment 10)

In 1982 alone, utilities cancelled plants at a loss of $5.4 billion. Particularly instructive is Virginia Electric Power Company's (VEPCO) cancellation of North Anna No. 3 with $540 million spent. VEPCO has two completed nuclear units and has been one of the most vigorous supporters of the nuclear industry. On North Anna No. 3, VEPCO concluded that nuclear power has "priced itself out of the market." (See Attachment 11)

After ten years of bad news about nuclear power and STNP, we face another forty years of equally bad or worse news, if STNP is completed, licensed, and goes into operation. Throughout that period, the investment will be at risk and demands for further repairs will likely drain more money. If STNP is switched on, the people of Bay City and surrounding areas will live at risk every day STNP operates.

The bottom line of this analysis is that STNP is a <u>high risk investment in a defective product</u>. The economic exposure required to finish STNP threatens a ruinous loss to the entire partnership. With readily available alternative strategies which are safe, economical, reliable, and environmentally sensible, there is no reason to pursue the illusory promise of STNP any further.

The South Texas Cancellation Campaign proposes the following platform be adopted:

1. Support for cancellation of STNP.

2. Support for creation of a Recovery and Conversion Task Force to analyze all methods for recouping the investment to date through alternative uses of materials already purchased or contracted for in an unavoidable contract; liquidation of materials for which other uses are not found; and alternative uses for installations which either cannot be dismantled or for which alternative use is more economical than dismantling and liquidation.

3. Pursuit of the partners' law suit against Brown and Root.

4. A vigorous and sustained effort to convince the other partners and their constituencies that cancellation is the best option.

5. Aggressive pursuit of alternative strategies of energy conservation, energy efficiency, and renewable technologies. (Attachment 12 is only one of the many opportunities available for changing how we go about meeting our energy needs.)

STCC is aware that the decision to push for cancellation is difficult in light of the losses likely to be incurred. The basic premise of this briefing paper, however, is that making that tough decision now will take the partners off a path leading only to greater hardship and reorient the partners towards a strategy promising long term benefits for their communities.

STCC is also aware that there will be difficulties convincing the partners to cancel the project. While the people of Austin are far more educated on the issue, having participated in numerous STNP-related elections, there is still a job to do in conveying the cancellation message to the public. San Antonio is deeply divided on the issue and there is not yet a majority of the City Council prepared to end San Antonio's involvement. To date, the people of Corpus Christi do not seem to have engaged themselves to any great extent in the STNP debate. Nor has the Board of Directors of CP&L shown itself to be very responsive to public opinion.

The Houston City Council is increasingly hostile to HL&P and may well sue the Public Utility Commission for allowing HL&P to recover $200 million of the Allens Creek loss from the ratepayers rather than the stockholders. Shareholders are unhappy with that the PUC put $166 million of the Allens Creek loss on the stockholders. Major community groups in Houston oppose continuation of STNP. Given the economic, regulatory, and policial climate for STNP, the HL&P Board of Directors have every incentive to cancel STNP.

The ability of the South Texas Cancellation campaign to achieve cancellation is directly related to the amount of money and other resources available to the cancellation campaign. With a budget of one week's worth of STNP ($6.25 million) spent on convincing the partners and their constituencies to cancel STNP, cancellation would be achieved within weeks. The less we have to spend, the longer cancellation will take. With a budget of $100,000, we believe cancellation could easily be achieved within six months.

The longer cancellation takes, the greater the economic loss all the partners will suffer. STCC proposed cancellation on December 8, 1982. Since then the partnership as a whole has spent at least $6.25 million each week.

The crossroads is before us. The choice is ours.

Houston Lighting & Power Company ATTACHMENT 1

CEU #5

OFFICE MEMORANDUM

To H. C. Dodd

From J. H. Ferguson

August 13, 1979

ST-HS-BC-01192

Subject SOUTH TEXAS PROJECT
ELECTRIC GENERATING STATION
B&R CONSTRUCTION ACTIVITIES - STP SITE

The performance of B&R in carrying out the construction of the South Texas Project has been, and continues to be, unacceptable. The fact that new B&R site management has been in place for approximately three months with little change in method of operation or improvements in performance, raises serious questions about B&R's intent and ability to satisfactorily construct the South Texas Project. It is of particular concern since the most difficult phases of the work are yet to come. If there is not immediate evidence shown of significant improvement in the management, control and execution of the work, HL&P will have no choice but to consider other alternatives for the completion of construction of the project.

The major areas requiring your immediate attention and action are outlined below.

1. Management and Supervision

The South Texas Project is one of the largest and probably the most important project B&R has. Accordingly, HL&P expects the best talent in the B&R organization to be assigned to STP. We don't believe that to be the case today.

The 8-6-79 Force Report shows approximately 350 managers, superintendents, general foremen and foremen assigned to construction. This number of supervisory personnel should be more than adequate for this phase of the work if they are sufficiently qualified, properly assigned and effectively instructed. Clearly, these criteria are not being met because construction supervision has been and still is inadequate. It is obvious that:

- B&R has not assigned their best and most experienced people to the job;
- Several people were assigned or promoted to responsibilities beyond their level of experience;
- Many people have been exposed to or a part of inadequate performance so long that it is now the norm; and
- Detailed planning and clear instructions (with performance measurements) are inadequate or non-existent.

You are hereby directed to take immediate steps to have the most qualified construction personnel assigned to STP or to demonstrate that it is already the case. You are to evaluate each individual in a position of construction supervision to ensure that he is adequately qualified and to take steps to replace any individual who is unable to recognize and produce top performance. Finally, you are to take immediate steps to implement detailed planning and scheduling, clear instructions to all levels of supervision and then measure performance against established standards (primarily cost and schedule).

Please advise me of the results and/or status of the above by 8-22-79.

2. Planning, Scheduling and Controls

The involvement of key personnel in the baseline effort is recognized; however, the absence of an effective interim system for planning, scheduling and control is unacceptable. For example, there are no logic networks even for the next 1-3 months which can be used to plan the work, communicate to all involved what is to be done or to measure performance. There is no meaningful or accurate means of monitoring productivity at a foreman or even a general foreman's level.

The intent to develop such a control system is understood but to date all that appears to have taken place is discussion. There is still no schedule for the development of the system or details of what the system will consist of when developed.

The urgent need for planning, controls and performance measurement is apparent both from activities in the field and from the progress curves presented to the Management Committee on 8-8-79, which clearly demonstrates that work has already fallen behind the baseline schedule. This is extremely disturbing for the following reasons:

- The baseline schedule is only 1-2 months old; and
- The work was rescheduled by B&R based on known conditions (at least for the immediate work) and historical performance data.

If the schedule can't be met under the above conditions even during the first 1-2 months, it is obvious that the B&R performance onsite is getting worse instead of better.

You are hereby directed to provide by 8-22-79:

- A detailed written description of the proposed controls system;
- A schedule for the development and implementation of this controls system; and
- A schedule for the development of detailed logic networks (as opposed to man and quantity loaded bar charts) for the next 3-6 and 12 months and for the remainder of the job.

Finally, you are to provide the information outlined in my memo on Weekly Construction Scheduling Meeting and be prepared to hold the first meeting on 8-20-79.

3. Craft Productivity

The productivity of the crafts as measured by manhours expended per unit of work in place is considered unacceptably low for most types of work. Many of the reasons are obvious.

- A high percentage of the work force can regularly be seen walking around, standing around or talking in groups. Either there are too many craftsmen, not enough planning or inadequate supervision.
- Work crews do not appear to be consistent in size or well planned.
- HL&P fully supports equal employment opportunities for women but also fully expects them to perform in the job for which they are employed. It is not expected that they be put on the payroll simply to fill quotas. It is strongly suggested that the ability to establish some type of dress code be investigated.
- Manual methods are used where power tools or equipment would be much more efficient.
- Although some improvement has been noted, work is still slow in getting started at the beginning of a shift and there are still entirely too many early quits at the end of the shifts.

It is understood that difficulty is being encountered in getting enough of certain crafts to fully staff the day shift. It is obvious that if the crafts currently on days were fully productive, in most cases, they would be more than ample. However, even if that was not the case, the effectiveness of and need for a second shift of the present size should be carefully evaluated to determine if those craftsmen would not be better utilized on the day shift.

You are hereby instructed to take immediate steps to correct the situation described above. Specifically it is expected that:

- Detailed planning and scheduling will be implemented including issuance for review;
- Performance monitoring will be instituted at all levels (scheduled versus actual progress, unit rates at meaningful and specific levels) and the results will be issued to and reviewed by all levels of supervion;
- Supervision (superintendents as well as foremen and general foremen) will spend as near full time as possible out in the field, visibly and physically directing the craftsmen;

Houston Lighting & Power Company

OFFICE MEMORANDUM

To

From

Subject

August 13, 1979
ST-HS-BC-01192

- Nonperformers at all levels (except for reasons beyond their control) will be immediately terminated; and
- Work methods will be evaluated for effectiveness.

4. Housekeeping

The cleanliness and orderliness of the site, particularly inside the buildings is unacceptable and getting worse. Please take immediate steps to correct the situation.

The items listed above are generic in nature and must be resolved if B&R expects to perform this work with any measure of economy or schedule maintenance. Please keep me advised of the progress and status.

JHF:ln

cc: E A Turner
D G Barker
H O Kirkland
S H Grote
J C Bazor
STP-RMS

File No.: B-0100

ATTACHMENT 2

DOCKET NO. 4540

APPLICATION OF HOUSTON LIGHTING AND POWER COMPANY FOR A RATE INCREASE	PUBLIC UTILITY COMMISSION OF TEXAS

FINAL ORDER

In public meeting at its offices in Austin, Texas, the Public Utility Commission of Texas finds that after statutory notice was provided to the public and to interested parties, a hearing in the above styled cause was conducted by an examiner who issued a Report containing Findings of Fact and Conclusions of Law, which Report is adopted in part and modified in part, as follows:

The application of Houston Lighting and Power Company (HL&P) is hereby GRANTED in part and DENIED in part, as set out in the Examiner's Report, as amended on November 16, 1982, subject to the following modifications:

I. Revenue Related Modifications

A. The invested capital of HL&P shall be reduced by $2.8 million. HL&P had accrued this amount for a Liquid Metal Breeder Reactor Project which has since been terminated. This is cost free capital and should be deducted from invested capital.

B. The cost of equity shall be reduced by .5% to 16.35%. This is a penalty for poor management, and shall remain in effect until HL&P's next rate case, and is not subject to recovery at some future time.

C. The following Findings of Fact & Conclusions of Law shall be changed, as a result of the above modifications, as follows:

Page 68, - Finding of Fact No. 6,- should be changed to read:

6. HL&P's invested capital is valued at $3,951,544,000, as shown below:

(In Thousands of Dollars)

Plant in Service	$3,962,797
Accumulated Depreciation	-797,665
Net Plant	$3,165,132
Construction Work In Progress	947,699
Property Held For Future Use	3,180
Nuclear Fuel	60,769
Working Cash Allowance	44,531
Materials and Supplies	42,257
Prepayments	3,267
Fuel Inventory	76,706
Less	
Deferred Taxes	330,228
Pre 1971 Investment Tax Credits	8,279
Customer Deposits	20,695
Property Insurance Reserve	8,120
Other Cost Free Capital	24,675
Total Invested Capital	$3,951,544

Page 68, - Finding of Fact No. 7, should read:

7. The rate base adjustments recommended by the examiner, including the additional adjustment of an increase to cost free capital of $2.8 million, which reduces invested capital by this same amount, and used in deriving Finding of Fact No. 6, are reasonable for the reasons stated in this Report.

Page 68 - Finding of Fact No. 9,-should read:

9. A balance of 34.625 percent net current cost and 65.375 percent net original cost is reasonable for the purpose of calculating the adjusted value of HL&P's invested capital. Using these percentages, the adjusted value of HL&P's invested capital is $4,938,387,000. See also, attached revised Exhibits I and II.

Page 69, Finding of Fact No. 11, should read:

11. For reasons set out in this Report, 16.85 percent return on common equity capital is reasonable for HL&P. An annual return of $499,435,000, which constitutes a 12.63 percent return on HL&P's invested capital, and a 10.11 percent return on the adjusted value of HL&P's invested capital, is fair and reasonable, is adequate under efficient management to allow HL&P to maintain its current credit rating and to attract the capital necessary for the proper discharge of its duties as a public utility, and is sufficient to insure confidence in the financial integrity of the company.

However, the return on equity set forth above is reasonable only under circumstances of efficient management. Because the evidence in this case establishes that HL&P has been imprudent in its management on many occassions in the past, such as its handling of STP, its purchase of coal without first test-burning it, its unusual handling of ACNP in this docket, its use of an 80% capacity factor in its studies on ACNP when NRC data showed a 56% capacity factor to be prudent , as well as other instances which are supported by the examiner and the record in this proceeding, HL&P should be penalized by lowering its return on common equity by .5% to 16.35%. Thus, a return of $489,991,000 in this docket is proper and reasonable. This penalty shall remain in effect until the company's next rate case, and is not subject to being recovered at some future time.

Page 70, Finding of Fact No. 24, should read:

24. HL&P's adjusted test period revenue deficiency is found to be $182.6 million, rather than the $336 million as stated by the company in its rate-filing schedules.

Page 71 - Conclusion of Law No. 3, should read:

3. HL&P proved that it is entitled to additional annual revenues of $182.6 million.

II. Modifications - South Texas Nuclear Project

A. The $1.7 billion ceiling placed on HL&P's share of the South Texas Nuclear Project shall be deleted, so as to avoid any implication that the Commission might be approving expenditures for STP to this level, or the implication that HL&P need not eventually prove that all dollars expended on STP over the years must be proved reasonable to the satisfaction of the Commission.

B. The following Findings of Fact and Conclusions of Law shall be changed, as a result of the modifications set forth directly above, as follows:

Page 69, Finding of Fact No. 16 should read:

The record evidence establishes that HL&P has mismanaged STP. It is clear that HL&P is responsible for the delays at STP and for not responding to problems at STP in a more timely fashion. HL&P has shown mismanagement, not only in its handling of STP, but in its purchase of coal without first test-burning it, its unusual handling of ACNP, and its use of an 80% capacity factor in its studies on ACNP when NRC data showed a 58% factor to be prudent, and various other instances which are supported by the Examiner's Report and the record herein.

Page 69, Finding of Fact No. 17 should read:

17. Protective measures having to do with the Court suit between HL&P and B&R should be adopted.

III. Modifications - Rate Design

A. The ratchet provision for Texas New Mexico Power Company shall be lowered to 75%.

B. The General Counsel's office shall institute an inquiry into the relationship between the firm rate for Dow relative to the firm rate for LOS-A customers. This inquiry shall be limited to the rates charged only to these customer classes, and shall be consolidated with the docket which will result from HL&P's filing of a tariff for interruptible power in conformance with the examiner's recommendations.

C. Findings of Fact should be changed, as a result of the modifications set forth directly above, as follows:

Page 70 - Finding of Fact No. 27 should read:

27. The record supports a change in TNP's ratchet to 75%; however, the record does not support TNP's theory that certain costs should not be allocated to TNP.

Page 70 - Finding of Fact No. 29, should read:

29. The record is inconclusive on whether Dow rates are discriminatory relative to LOS-8 rates, and therefore an inquiry should be instituted to investigate the issue more fully. In the meantime, the rate design stipulated to in this case for Dow and LOS-8 should be approved.

IV. Additional Language and Findings of Fact - Rate Design

A. The Examiner's Report shall be amended at page 55, to include the entire stipulation on rate design, as follows:

Page 55 - after Number 2, add:

"As to revenue assignment, the stipulation provided that:

3. The methodology for assignment of revenue from the customer classes provided by staff witness Kent Saathoff is also appropriate. Each rate class should be assigned revenue to move it one-half the way toward a relative rate of return of unity where possible. However, no class should receive more than approximately one and one-half or less than one-half times the system wide percentage increase in total revenue. The only exception should be the Public Utility class which should be assigned its cost based revenue."

B. Finding of Fact No. 26 shall be changed to read:

26. Staff's allocation methodology and methodology for assignment of revenue from the customer classes is appropriate in this docket for the reasons stated in this Report."

C. Finding of Fact No. 34 shall be added, as follows:

34. HL&P's rate design for the residential class is reasonable.

V. Affiliated Fuel Costs - Modification

The examiner's recommendations shall be modified so that HL&P shall file a tariff and associated costs by December 20, 1982 for costs to be set for the period April 1, 1983, through June 30, 1983. The formula for UFI fuel costs set forth in the Examiner's Report, and as modified by the examiner, shall remain in effect only until April 1, 1983.

VI. Treatment of Taxes Associated with Allen's Creek Nuclear Project

For purposes of clarification, the Commission hereby adopts the examiner's treatment of the tax benefits associated with the $166 million of expenditures disallowed for the Allen's Creek Nuclear Project (ACNP). This $166 million unrecoverable portion of ACNP expenditures will be written off for tax purposes and will result in tax savings to HL&P. These savings should properly inure to the benefit of the ratepayer as a credit to tax expense. The tax benefit should be spread over the ten-year amortization period adopted herein for ratemaking purposes. The examiner's tax calculation, which calls for HL&P to bear the burden of the $166 million disallowance, after taxes, is explicitly approved herein.

IT IS FURTHER ORDERED that:

1. HL&P shall report to this Commission within twelve months before the filing of a rate case in which it intends to include South Texas Nuclear Project in rate base.

2. HL&P shall report to the Commission within six months before implementation of any substantial changes associated with the STP project.

3. HL&P shall pass through to ratepayers any amounts the courts may award HL&P in its lawsuit against Brown and Root in HL&P's next rate case following such award.

4. Any amounts assessed against HL&P in its court suit, including expenses for the suit it has filed against Brown & Root, shall not be recovered in any manner from HL&P ratepayers.

5. HL&P is hereby advised that if, in the future, it incurs abnormal customer outages, this Commission will give serious consideration to ordering neighboring utilities to serve existing or new customers within HL&P's certificated service area.

6. HL&P shall pass through to ratepayers, in its annual rate filings, all recoveries associated with the Allen's Creek Nuclear Project, including all amounts for equipment sold, and costs avoided through negotiation of existing contracts, or other arrangements. These recoveries are to be used to reduce the unamortized balance of approximately $195 million. Thus, it is to be made clear that recoveries from salvage shall inure to

the benefit of customers and the balance yet to be amortized of $195 million shall be reduced by any such recoveries. However, any recoveries associated with equipment acquired, contracts made, or any other arrangements, which can be clearly shown to be related to the period January 1, 1980 to August 26, 1982, shall not be used to reduce the unamortized balance of $195 million. The method of allocation by which the amounts associated with ACNP and STP shall be refunded to each customer class shall be litigated in HL&P's next rate case.

7. Beginning with February 1983, billings, HL&P shall not list individual cost of service items, such as fuel, seperately on customer bills.

8. HL&P shall file a tariff, and details of costs associated with its affiliated fuel costs, by December 20, 1982, for the purpose of setting fuel costs for affiliated interests for the period April 1, 1983 through June 30, 1983. The procedure shall repeat itself on a quarterly basis. The next tariff filing should then be filed on or before April 1, 1983 for the quarter beginning July 1, 1983. No affiliated costs shall be passed through automatically to HL&P ratepayers after April 1, 1983.

9. HL&P shall file a proposed interruptible tariff, as recommended in the Examiner's Report, within ninety (90) days of this Order. General Counsel shall file an inquiry into the relationship between the firm rate for Dow relative to the firm rate for LOS-B customers. This inquiry shall be limited to the rates changed only to these customer classes, and shall be consolidated with the docket which will result from the filing of a proposed interruptible tariff by HL&P.

10. HL&P shall file a revised tariff in accordance with the Opinion, Findings of Fact, and Conclusions of Law herein sufficient to generate revenues not greater than those prescribed in this Order. HL&P shall file a copy of its revised tariff on all parties of record at the same time that it is filed with the Commission. The parties shall have ten (10) days from the date of such filing to present their written objections to the revised tariff, if any, to the Commission staff for its review and consideration. The Commission staff shall have twenty (20) days from the date of such filing of the revised tariff to review it for approval or rejection. The tariff shall be deemed to be approved and shall become effective upon the expiration of twenty (20) days after filing, or sooner upon notification by the Commission Secretary. In the event of rejection, HL&P shall be notified and a copy sent to the intervening parties herein by the examiner, and HL&P shall have fifteen (15) additional days to file an amended tariff and the same procedure shall be repeated herein. The revised and approved rates shall be charged by HL&P for electricity consumed after the tariff approval date. This Order is deemed to be final

on the date of rendition. Approval of the tariff, for all purposes, shall be deemed to be final on the date of its effectiveness either by operation of this Order or by notification by the examiner, whichever occurs first. If the date of approval of tariff falls within HL&P's normal customer billing cycle, HL&P is authorized to prorate customer bills to charge customers for consumption each day of the month under the appropriate tariff in effect on that day of the month.

11. All motions, requests, applications, and requests for Findings of Fact and Conclusions of Law not expressly granted herein are denied for want of merit.

SIGNED AT AUSTIN, TEXAS, on this 6th day of December, 1982.

PUBLIC UTILITY COMMISSION OF TEXAS

SIGNED: H. Moak Rollins
H. MOAK ROLLINS

SIGNED: G M Conder
GEORGE M. CONDER

SIGNED: T. G. Smith
T. G. SMITH

ATTEST:

Jacqueline Dillon For
RHONDA COLBERT RYAN
ACTING SECRETARY OF THE COMMISSION

tab

Exhibit I

HOUSTON LIGHTING & POWER COMPANY--4540
REVENUE REQUIREMENT
(000's)

Description	Test Year Per Books	Company Adjustments	Company Test Year	Staff Adjustments	Staff* Test Year	City Adjustments	City Test Year	Examiner Adjustments	Examiner Test Year
Fuel	$1,673,251	$129,325	$ 1,802,576	$ 110,803	$ 1,913,379	$ 30,732	$ 1,833,368	$ 110,803	$ 1,913,379
Purchased Power	130,764	95,139	225,903	9,667	235,570	0	225,903	9,667	235,570
Operations and Maintenance	330,850	55,871	386,721	(84,540)	378,868	(7,260)	379,461	(83,590)	379,818
Extraordinary Amortization	3,044	91,112	94,156	(38,329)	55,827	(91,112)	3,044	(71,600)	22,556
Depreciation	117,376	16,257	133,633	0	133,634	(4,933)	128,700	0	133,634
Other Taxes	95,012	22,495	117,507	74,663	192,170	(2,409)	115,098	72,593	190,100
Franchise Fees	60,166	16,521	76,687	-	-	(2,621)	74,066	-	-
Interest on Customers Deposits	0	1,225	1,225	0	1,225	0	1,225	0	1,225
Federal Income Taxes	178,222	118,223	296,445	(19,132)	277,313	(30,673)	265,772	(43,263)	253,182
Return	354,694	165,305	519,999	(19,552)	500,447	(16,655)	503,344	(30,008)	489,991
Revenue Requirement	$2,943,378	$711,473	$ 3,654,852	$ 33,501	$ 3,688,434	$(124,931)	$ 3,529,921	$ (35,397)	$ 3,619,456
Less									
Other Revenue	$ 74,218	$ 17,560	$ 91,778	$ (1,355)	$ 90,423	$ (2,621)	$ 89,157	$ (2,850)	$ 88,928
Fuel Revenues	1,779,830	204,175	1,984,005	120,470	2,104,475	30,732	2,014,737	$ 120,470	$ 2,104,475
Base Rate Revenue	$1,089,331	$489,738	$ 1,579,069	$ (85,534)	$ 1,493,536	$(153,042)	$ 1,426,027	$ 153,017)	$ 1,426,053
Less Test Period Base Rate Revenue Adjusted			$ (1,243,371)		$ (1,243,371)	$ (1,095)	$ (1,244,466)		$(1,243,371)
Base Rate Revenue Deficiency			$ 335,698		$ 250,165	$(154,137)	$ 181,561		$ 182,682

* Based on Staff Ex. No. 17, revised downward after hearing

ATTACHMENT 3

U.S. Checks Nuclear Plants for Use of Substandard Parts Sold to Them Fraudulentl[y]

U.S. Checking Nuclear Plants On Faulty Parts

By JUDITH MILLER

Special to The New York Times

WASHINGTON, Jan. 21 — The Government has begun investigating whether nuclear plants throughout the country are using substandard steel components that were sold to them fraudulently marked, according to Government documents and officials.

Officials at the Nuclear Regulatory Commission stressed today that the material traced to nuclear plants so far did not suggest a threat to public health and safety. But they said the parts could cause trouble if they were used in primary cooling systems or emergency core-cooling systems.

Only a fraction of the fraudulently marked steel has been found, commission officials say. The agency plans to send out a notice Wednesday to all utilities, seeking their help in tracing the material, officials said.

Inquiry Began This Month

The commission opened the investigation earlier this month after learning that hundreds and perhaps thousands of substandard and fraudulently marked small steel components sold since 1960 might have been used in nuclear plants. The components included such items as small pipes, pipe fittings and tubes.

In one case, the commission has determined, pipe fittings sold as being able to withstand 3,000 pounds of pressure were expected to endure only 150 pounds.

Representative Richard L. Ottinger, Democrat of Westchester, who is chairman of a House Energy subcommittee that oversees the nuclear commission, said the case raised serious questions about the agency's ability to insure the safety of nuclear plants and about Federal agencies' cooperation in cases that may involve risks to public health and safety.

"This is but the latest of a series of discoveries that display inadequacies in the ability of the commission's quality assurance program to detect defects in the construction of nuclear facilities," Mr. Ottinger, a frequent critic of the commission, wrote in a letter this week to Nunzio J. Palladino, its chairman.

The components, purchased since 1960 by more than 50 companies, were originally sold by Ray Miller Inc., of West Caldwell, N.J. The company, which has filed for reorganization under the Federal bankruptcy law, pleaded guilty in West Virginia last December to 19 counts of mail and wire fraud. The charges involved the mismarking and fraudulent sale of parts from 1960 to 1978.

The company was fined $10,000, the maximum financial penalty, court records show. Its executives did not return a reporter's telephone calls to the company this week.

Since January investigators from the regulatory commission have been studying 29 boxes of company records, more than 48,000 documents, to determine which nuclear plants acquired the steel and how they have incorporated it.

"About 10 percent of Ray Miller's customers were possibly involved in the nuclear industry," concluded a notice about the commission's inquiry distributed within the agency last Monday.

Steel Traced to Two Plants

To date, commission investigators have traced the steel to the Surry nuclear plant, owned by the Virginia Electric and Power Company, and to the Barnwell nuclear plant, a nearly completed reprocessing plant in South Carolina. Some material may have made its way to a centrifuge enrichment plant being constructed in Portsmouth, Ohio, and to at least three other utilities that operate nuclear plants, officials said.

Spokesmen for Vepco and Barnwell said material located so far did not suggest there was any risk to public health and safety.

The commission began reviewing the case Jan. 6, after the Justice Department completed criminal action against Ray Miller Inc. The commission was not informed of the Justice Department's investigation for many months after the department learned that some of the steel might have ended up in nuclear plants.

Moreover, the commission learned only by happenstance about the potential problem. When the case was finally brought to the commission's attention, Justice Department officials declined to give the agency's investigators access to the company's documents until they had completed prosecution of the company.

"It is appalling that the N.R.C. and Justice Department did not exchange information sooner about this problem," said Mr. Ottinger.

G.A.O. Is Investigating

At the behest of Mr. Ottinger, the General Accounting Office, a Congressional investigative arm, has begun looking into how the case has been handled.

Ruth Lyssette Baxter, Assistant United States Attorney in Charleston, W.Va., said her office first learned last summer that some of the material might have been sent to nuclear plants. She did not get in touch with the commission, she said in an interview, because she was bound by laws of secrecy surrounding grand jury investigations.

Edward Jordan, director of the Nuclear Regulatory Commission's division of emergency preparedness and engineering response in the office of inspections and enforcement, said his office initially learned of the problem last fall from a commission official in West Virginia who had seen a news article about the case.

Mr. Jordan said his office requested access to the documents in December, but was denied it until the Justice Department had completed its legal action against the company. He acknowledged that the commission could have sought a court order to win to the documents.

"But given what we knew and the demands on our office's resources, we did not believe that this case warranted greater priority," Mr. Jordan said.

He added that more immediate action would have been taken had the agency suspected that the substandard steel might have been incorporated in the primary systems of nuclear plants.

Rodney Smith, a public information officer for Vepco, said a review of the Surry plant indicated that some of the Ray Miller components had been traced to the primary systems of the plant, but that they did not pose any danger.

"There's nothing to indicate there are faulty components in the piping of the safety systems," Mr. Smith said. "And even if there were, we have back-up safety systems. The plant's safety mechanisms are designed for redundancy."

George Stribling, a spokesman for the company that manages the Barnwell plant in South Carolina, said none of the suspect parts had been used in constructing the reprocessing facility, which is not yet operating.

Commission and Justice Department investigators said the effort to trace the substandard parts was complicated by the resale of much of the material by intermediary companies. Officials acknowledge they may never locate all the steel.

N. Y. Times

January 22, 1983

14A /The Houston Post/Thurs., Mar. 3, 1983

NRC discloses total failure of U.S. reactor

WASHINGTON (UPI) — A double equipment breakdown last week at the Salem, N.J., nuclear plant caused the first complete failure of a U.S. commercial reactor to shut down automatically, a Nuclear Regulatory Commission official said Wednesday.

Less than 30 seconds after automatic shutdown systems failed at the plant, an operator shut down the reactor manually, the five NRC commissioners were told.

The Salem facility is in southern New Jersey, 20 miles south of Wilmington, Del.

"This was the first complete failure of the automatic scram (shutdown) system," Roger Mattson, a top official of the NRC's office of nuclear reactor regulation, told reporters after the meeting.

THE COMMISSION ALSO was told that reports are being prepared on how similar problems at the Salem Unit 1 plant, operated by the Public Service Electric & Gas Co. of New Jersey, can be avoided in the future.

PALLADINO

NRC Chairman Nunzio Palladino said he does not want the plant restarted until the commission is informed of what progress is being made on solving the problem.

Mattson said the situation would have been far more serious if the 1.07-billion-watt plant had been at full power when the failure occurred last Friday. But the reactor, which was being tested after a refueling, was only operating at 22 percent of full power.

NRC officials said that at the time of the mishap, one of the unit's two steam generators was low on water, and automatic machinery signaled the plant to shut down. The reactor shutdown is accomplished by dropping long, radiation-absorbing rods into the reactor, ending the nuclear reaction.

The rods, which are suspended by electric magnets, are to drop as soon as power is cut to the magnets. But a breaker that was supposed to cut the power jammed five times and a second breaker jammed three times.

AN ALARM WENT OFF in the control room when the problem occurred and an operator shut the plant off manually in less than 30 seconds.

A similar problem occurred on Feb. 22 in one of the breakers, but went unnoticed, officials said.

"Yes, we made a mistake," said Richard Eckert, a senior vice president of Public Service Electric. "We did not pick up the problem. We should have."

Denwood Ross, deputy director of the NRC office of nuclear regulatory research, said the odds of the automatic shutdown failing are about six in every 100,000 years of reactor operation.

NRC officials said that before the Salem situation, there was one partial failure of a nuclear plant to shut down. That occurred at Brown's Ferry Unit 3 in Decatur, Ala., in June 1980, when some of the control rods were unable to drop fully because the tubes they fall into were partially filled with water.

THERE HAVE BEEN MORE than two dozen failures of breakers like those that failed at Salem at various plants around the country. But only one breaker at a time has failed in the past.

The plants and number of failures are: Zion in Zion, Ill., Unit 1, two times; Zion Unit 2, four times; Robinson Unit 2 in Hartsville, S.C., two times; Oconee in Seneca, S.C., Unit 1, four times; Oconee Unit 3, three times; Salem in New Jersey Unit 1, four times; Salem Unit 2, two times; Point Beach in Two Creeks, Wis., Unit 1, one time; Point Beach Unit 2, two times; Arkansas in Russellville, Ark., Unit 1, three times.

L.I. Atom Plant Nearly Ready But the Debate Goes On and On

SHOREHAM, L.I. — Long Island is preparing to enter the nuclear age, ending its near-total dependence on imported oil, with the completion of a reactor to provide a third of its electricity. But the plant is 10 years late and 30 times over budget, the most expensive reactor ever built, and its cost will probably make the area's bills the highest in the nation.

The price of the reactor will be $2.1 billion if commercial operation begins by September, according to the Long Island Lighting Company, but more delays seem likely. If the cost is passed along to the utility's consumers, as expected, the result will be rate increases estimated by Lilco at 38 percent — more if the plant is frequently shut for maintenance.

So far, customers' bills have reflected only a small amount of the reactor's cost. The rest of the money has come from Lilco's retained earnings and from money borrowed by the sale of bonds.

A sudden increase in rates would probably dampen demand for electricity, and the utility has proposed that the increase be carried out over three years.

The State Legislature is considering a proposal to forbid rate increases to pay for the plant, which would leave the company with an enormous debt. And the Public Service Commission plans an unusual investigation into why construction cost so much and whether Lilco's management was "prudent," a condition for charging customers.

The Nuclear Regulatory Commission is now holding licensing hearings. Lilco hopes that the hearings will end by March and that a license will be granted soon thereafter. But according to commission officials, the licensing board conducting the hearings usually takes several weeks to make its ruling, and the five commissioners then take about a month to review the board's decision.

A favorable decision would allow nuclear fuel to be loaded into the reactor. Lilco believes the plant will be ready for commercial operation — and thus become part of the basis for its rates — six months later. The company, which was once confident enough to specify to the minute when electric generation would begin, has become less specific.

"Only a fool would be totally confident," said Ira L. Freilicher, Lilco's vice president for public affairs.

The reactor has encountered fierce opposition from some Long Island residents over the years, and thousands have taken part in protest demonstrations. Opponents still have not conceded that defeat the reactor's operation is inevitable., flity, and They note that the plant cannot be licensed without an emergency plan, and that so far, Suffolk County has refused to approve one.

The Shoreham Nuclear Power Station was conceived when oil was $1.80 a barrel, and the reactor was to be cheaper. Now oil is more than $30 a barrel, but taking into account the cost of construction, the plant's electricity will be three times as expensive as the electricity produced by oil-fired plants.

The cost shot up when delays stretched construction through a period of high inflation and record interest rates, adverse court decisions and a flurry of new safety regulations that often required ripping out completed systems. Opponents are still arguing over safety, and the plant may sit idle while the Nuclear Regulatory Commission considers a license.

None of this was anticipated when the project was announced in 1966.

"If we had known that we were talking about a $3 billion plant and all the other travail that has gone along the way — the licensing — the political problems, I think we might have chosen not to," Mr. Freilicher said.

Those who believe the capital expense will be justified by long-term oil savings are keeping careful watch on proposals to spread out the impact of the plant's cost.

Paul Turner, vice president of the Atomic Industrial Forum, a Washington-based trade group, said the plant would save money over the course of its 30-year lifetime as the price of oil rises. But he said that unless there is some phasing in, consumers will see a sudden, sharp increase in their rates.

"This is not a unique situation," he said, pointing out that other utilities are now approaching completion of plants that will cause their rates to jump. Because construction costs have risen so high and because oil shortages and rising rates have depressed demand for electricity, 86 plants have been canceled over the last decade. No new plants have been ordered since 1978.

The schedule of rate increases is subject to approval by the Public Service Commission. Lilco currently has an 8 percent request pending, unrelated to Shoreham, but commission members have said they will vote to disapprove nearly all of it.

When construction of Shoreham began, "rate shock" was not a factor because costs were lower and were spread over ever-larger amounts of electricity sold by the utility. Now, high prices and low growth cast doubt on the decision to start the project. But Lilco believes that at each step, it made the only plausible decision.

"The question wasn't 'Shoreham' versus 'no Shoreham,'" said Adam M. Madsen, Lilco's manager of engineering. "The question was, 'Here we are, do we proceed, or do we abandon?'"

Cost estimates were faulty, partly because the company had little to go on. When Shoreham was announced, it was four times the size of the largest operating nuclear plant.

"It's obviously proven to be the fact that we were overconfident," said Mr. Freilicher. With the benefit of hindsight, he said, the company would have made several decisions differently.

When Shoreham was conceived, demand was growing by 8 to 10 percent a year, and Lilco said that without the reactor there would be blackouts in the early 1970's. In 1968, Lilco lost valuable months by withdrawing its application for a 540-megawatt plant so it could design a bigger one. And now, demand is growing by less than 2 percent a year.

The price of oil swung rapidly. The 1973 Arab oil embargo and the Iranian revolution raised the cost twelve-fold, making the expenditure of billions for nuclear power look good. Now, oil-fired power costs 6 cents a kilowatt-hour and Shoreham's would cost at least 20 cents. But Lilco says that 10 years from now the figures will reverse and Shoreham will begin saving money.

Lilco is assuming that general inflation will be 5 percent a year and that oil prices will rise even faster, by 7 percent a year. Lately, though, inflation has been lower and oil prices have been declining.

Lilco assumes that the increase in the real price of oil — that is, not counting inflation — will be nearly 43 percent by the end of the century. Others predict less; Consolidated Edison forecasts 26 percent. A smaller increase will push back the date that a $2.1 billion plant becomes economical.

"This is going to be a tremendous problem for Long Islanders," said Nora Bredes, executive coordinator of the Shoreham Opponents Coalition, whose members have been fighting the plant for years and still are.

Debts Somebody Must Pay

"There's not much satisfaction in saying I told you so," Miss Bredes said. "It's there whether it runs or not. That tremendous cost is going to have to be borne by somebody."

To some extent, the 2.7 million residents of Lilco's service area are already paying. Because the project has so shaken the company's finances, the Public Service Commission took the unusual step of letting Lilco charge ratepayers for part of the Shoreham cost before completion.

Gregory Palast, the former executive director of the Science and Technology Commission of the State Legislature, argues that the money has been bled from the island's economy. Lilco puts the total from ratepayers at $355 million to date, but Mr. Palast says accounting gimmicks hide a larger total.

"People would have had more money to spend on Long Island for consumption or capital formation," Mr. Palast said.

High Financing Expenses

Assembling the capital was expensive for Lilco. More than $1 billion of the $3 billion paid for the plant has gone for interest, property taxes and other carrying costs, according to Mr. Madsen. If completion is delayed past September, the price will rise by $35 million a month for carrying costs.

But Mr. Freilicher and others say Shoreham will eventually prove its worth because of the oil it will save. Among those who agree is the New York Power Pool, an organization formed by the eight major New York State utilities, including Lilco, for swapping power on a minute-to-minute basis, and doing long-range planning.

"We look at this business of reducing oil consumption as being important," said Bryan Gosling, a spokesman for the pool. "It's very possible in the next few years there could be some type of contingency. An embargo occurs — the hell with the price of the oil; suppose it's just plain physically not available?"

According to the Power Pool, 38 percent of New York State's electricity comes from oil or gas. The balance comes from coal and nuclear plants, and from hydro power, much of it Canadian.

Reliability Is Projected

To make the comparison with oil generation, the utility assumes that the reactor will operate more reliably than the average of existing reactors of its type, and takes into account that Shoreham will replace the least efficient oil generators in its system.

Many dispute Lilco's conclusions. Karen S. Burstein, chairman of the New York State Consumer Protection Board, said she would like to see Lilco shareholders pay for the miscalculations, having the Public Service Commission deny Lilco rates high enough to allow the company to pay dividends.

But the company blames its problems on a hostile environment. It cites these factors:

¶The longer the project went, the more legal obstacles it faced. For example, had it been built on schedule, Shoreham would not have required a full-length environmental impact statement. But the plant was delayed by two and a half years of hearings over a construction permit, by which time a Federal court decision concerning a reactor in Maryland required such a statement at Shoreham. That cost another year.

¶The Nuclear Regulatory Commission changed its rules on earthquakes, requiring the installation of hundreds of pipe hangers and "snubbers," or giant shock-absorbers for plant parts, in cramped spaces not designed for them. New requirements forced more equipment into the containment building of the plant, which had been built small as an economy measure.

¶The flow of regulations increased after the incident at the Three Mile Island plant in Pennsylvania, with requirements changing so fast that it was not possible to design and then build the plant; it had to be designed as construction went along.

Opponents point out that worker productivity was poor. A 1977 Lilco study, which has not been disputed by the unions, found workers were working only 20 percent of a seven-hour day; the rest was spent waiting, traveling on site, or washing up. An independent study found that this record was below average for the nuclear industry.

Lilco gave management of the project to Stone & Webster, and later, in an effort to speed construction, took direct control. Part of the company's problem, according to Miss Burstein, is that it gave too little attention to the project.

"Instead of spending time looking at Shoreham, they were busy with grandiose plans for capacity," she said. The company had plans for reactors totaling six times Shoreham's capacity, including a Shoreham twin.

Economist Faults Utility

Mr. Palast, the economist, also found fault with Lilco's handling of the project.

"They seem to have no concept of the basic function of a manager," he said. "The basic function of a manager is to ask the question, 'What if things go wrong?' " He called the company's dogged commitment to Shoreham "the Peter Pan method of management."

The Nuclear Regulatory Commission has also found faults. Although it reported last July that the overall record was "acceptable," it cited discrepancies between the plant as built and the Final Safety Analysis Report, a document written by Lilco and approved by the commission as part of the licensing process.

The commission cited "an apparent lack of aggressiveness" in sticking to the design specified in the safety report.

Company Fights Back

In the face of criticism, the company mounted a public-relations campaign. Lilco has spent $200,000 on radio advertisements praising Shoreham, and $145,000 to insert a 24-page, full-color booklet into a Sunday edition of Newsday, the Long Island newspaper, defending Shoreham's history. In the booklet, Charles R. Pierce, Lilco's chairman and chief executive officer, refers to criticism of the plant as "patently false rhetoric, some of it political."

But the plant, before it has generated a watt, is an object of fear to its neighbors in Suffolk County, according to a poll commissioned by the county. It was situated near a geographic dead end at a time when no one thought of evacuations, in an area now so heavily populated that county officials despair of organizing one.

Suffolk Blocks Plan Review

The emergency plans for the site must be complete before the plant receives its operating license, and they have spawned a bitter argument, with Peter F. Cohalan, the County Executive, accusing Lilco of "arrogance run wild."

The county and the company initially agreed to have the plans drawn by Suffolk's Planning Department, at Lilco's expense. Later, Suffolk changed its mind, and decided to commission its own plan, to be prepared by outside consultants. But Lilco took the unfinished document — the utility calls it a plan, but county officials say it is only a "work product" — finished it and submitted it to the New York State Disaster Preparedness Commission.

County officials, infuriated, got a court order barring the consideration of the Lilco-sponsored plan until the county has time to submit its own plan. The county plans hearings this month.

Lilco's plan calls for an evacuation zone of 10 miles, as specified by Federal regulations, although the company believes that area is larger than necessary. Suffolk's plan cites data showing an accident at Shoreham could produce acute radiation sickness at distances beyond 10 miles, and plans a 20-mile zone.

There are estimated to be 30,000 people living within 10 miles of the plant, according to Suffolk County, and more than 600,000 within 20 miles. Frank R. Jones, the deputy county executive in charge of the plan, says it is based on extensive surveys of how residents would react in case of accident.

But the dispute has involved pettiness rarely seen between major institutions. For example, Lilco submitted the plan to the Disaster Preparedness Commission in the blue loose-leaf binders specified by the county, though the county "denied authorization" for use of the binders. The county said the binders made the plan seem to be the county's instead of Lilco's.

Specious Preface Added

One binder now sits in the office of Frank R. Jones, the deputy county executive in charge of emergency planning. Mounted on it, in matching type and colors, is a mock preface that says "Lilco's Make-Believe," and under it, the binder, reading "Suffolk County Radiological Emergency Response Plan."

The County Legislature will begin hearings on its own plan tomorrow. In an effort at reconciliation, the company issued a statement Friday saying it was "prepared and indeed eager" to resume a cooperative approach to emergency planning.

The squabble goes on, but the end may be in sight. On the 499-acre site on the scalloped, windblown North Shore of Long Island, 55 miles east of Manhattan, the plant stands nearly complete. Workers are testing its myriad systems in preparation for the time when a nuclear chain reaction will be sustained, and water boiled into steam to power generators that will produce 810 megawatts of electricity.

From the outside, Shoreham does not look like the typical nuclear plant. It will use Long Island Sound for cooling water, and thus does not need the hourglass-style cooling towers needed at plants on smaller bodies of water.

And Shoreham is of a simple boiling-water design, with water to be boiled directly in the nuclear core and the resulting steam forced through turbines to generate electricity. The plant does not need the large containment domes of pressurized-water plants, which must have space for huge heat-exchangers called steam generators.

Steam Condensed for Reuse

At Shoreham, as at all General Electric plants, the steam is condensed back into water and fed back into the reactor core.

Instead of a dome, the reactor is housed in a circular concrete building with a green corrugated metal cap. An oblong turbine building is adjacent. Clustered around are buildings housing the control room, radiation waste-handling equipment, and shiny metal tanks with thousands of gallons of emergency cooling water.

As with all civilian nuclear reactors, at the moment there is no plan for disposal of spent fuel. In Shoreham's case, moving the spent fuel to a permanent repository will be difficult, because the only land route off the island is through New York City, which bars such shipments.

It is a construction effort on a scale the utility knows it cannot afford to undertake again soon. In its public-relations office in Mineola, a spokesman has a reminder pasted on the wall. Taken from Luke 14, it reads:

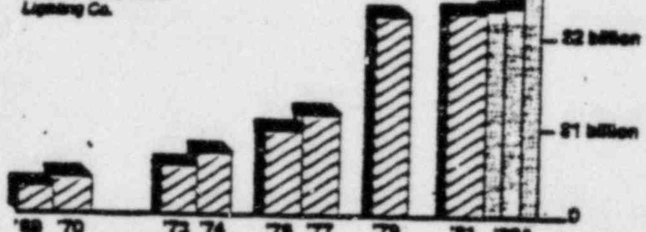
"For which of you, intending to build a tower, sitteth not down first and counteth the cost, whether he have sufficient to finish it?

"Lest haply, after he hath laid the foundation, and is not able to finish it, all that behold it begin to mock him,

"Saying, This man began to build, and was not able to finish."

The Cost of Shoreham

The Plant

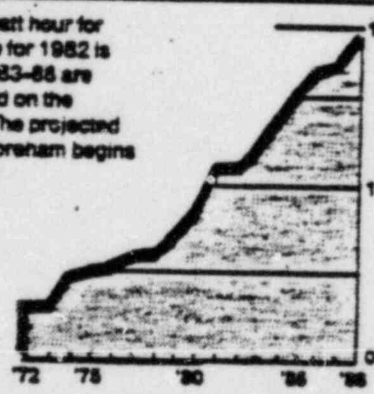


Changing cost estimates since 1969 for the years indicated.

Source: Long Island Lighting Co.

* Year is split into June, September and October, respectively

The Power



Price in cents per kilowatt hour for Lilco customers. Figure for 1982 is estimated; those for 1983-88 are projected and are based on the utility's rate requests. The projected figures assume that Shoreham begins operating late this year.

Source: Long Island Lighting Co.

A Comparison

A sampling of plants, with actual or projected dates of operation. Figures are in dollars per kilowatt of capacity.

Shoreham (6/83)	$3,800
Susquehanna 1 (11/82) and 2 (12/84)	1,800
LaSalle 1 (10/82) and 2 (Fall '83)	1,100
Indian Point 2 (8/73) and 3 (8/76)	438*
Brunswick 1 (3/77) and 2 (11/75)	423

* Includes capital investments through 1981

Source: Owners of each reactor, Komanoff Energy Associates

The New York Times / Jan. 16, 19[illegible]

ATTACHMENT 6

Survey of Bechtel's Previous Quality Assurance Record

The following summary of Bechtel's record is based on a paper submitted to the NRC by the Government Accountability Project of Washington, D.C.. The full report is available for review upon request.

Intolerance of Criticism

The problems of inspector intimidation and poor construction practices at STNP came to light because an inspector, Daniel Swayze, had the courage to come forward and reveal these problems.

Bechtel frowns upon such revelations at Bechtel projects. A December 1982 press release by Bechtel said the following about whistleblowers:

> "It is unfortunate that public confidence in San Onofre has been briefly shaken by the highly publicized allegations of the disgruntled fired employee. ... It would seem inescapable that another product of the Kent affair should be increased public skepticism: skepticism about the integrity and motives of so-called whistle-blowers and skepticism about the anti-nuclear groups that use both whistleblowers and the media."

The "Kent affair" refers to E. Earl Kent, a welder with 40 years experience, former Senior Quality Control Engineer with Bechtel, published welding author, and holder of numerous welding patents. After submitting a sworn affidavit regarding welding inadequacies at San Onofre to the NRC in June 1982, Mr. Kent heard nothing further. In September 1982, he contacted the Orange County Alliance to express his concerns. The Alliance held a press conference forcing the NRC to finally investigate.

Bechtel has a practice of requiring its nuclear employees to agree, as a condition of employment, to the following:

"I shall not disclose or use, directly or indirectly, at any time, any information as above defined, unless such disclosure or use is in the course of my employment with Bechtel, or has been authorized in writing by Bechtel. I shall not remove any writings containing information from the premises or possession of Bechtel or its clients, unless I have obtained express authority in writing by Bechtel to do so."

If this agreement were enforced against any employee whose disclosure could lead to an NRC investigation or proceeding, the reprisal would be flatly illegal under the Atomic Energy Act. This agreement also fails to inform employees about that section of the Act which provides criminal penalties for any construction employee who by act or omission knowingly or willfully violates or causes to be violated any NRC regulation or license condition so as to result in a significant impairment to the reactor's safety.

Clearly, the Bechtel secrecy agreement serves to muzzle employees who otherwise might feel morally bound to come forward with safety concerns about the plant.

Case Studies

1. Midland: Under construction by Consumers Power Co., Midland is a disaster. Bechtel has been both the architect-engineer and the main construction contractor. The cost estimate rose from $1.67 billion to $3.5 billion in Bechtel's more than ten years of work to date.

Quality assurance breakdowns repeatedly occurred at Midland. A major problem is in the welding program. On December 3, 1982, 1,000 Bechtel workers had been laid off and most safety related work at the site stopped because Bechtel errors were, according to the NRC, "significant and serious and have implications for the rest of the plant." Among the specific problems were unidentifiable cable size/type; at least 15,000 backlogged quality control records; and unqualified or uncertified welders.

The most serious construction flaw is a foundation soils quality failure which resulted in cracks in one major building, instability in a second major building, and other safety structures in serious jeopardy of shifting or settling. The problem is a direct result of Bechtel's failure to comply with specifications.

Bechtel misled the NRC about the problem leading to an NRC recommendation for enforcement action for Bechtel's report "in careless disregard for the facts."

Bechtel also attempted remedial construction without NRC prior approval.

The NRC found Bechtel dominating Consumers just as Brown and Root dominated HL&P. The NRC concluded the attitude of Bechtel on the Midland site "precludes quality workmanship." The NRC inspectors found Bechtel repeatedly obstructing NRC investigative efforts and even withholding information from Consumers, their supposed employer.

Bechtel has fouled up the Midland plant so badly that Consumers must implement multiple third party reviews - a 100% inspection of all safety related components, a 100% retraining and recertification program for all quality control and quality assurance personnel, and an audit of all work performed on the soils remedial program. The burden on Consumers caused by Bechtel is greater than the burden imposed on HL&P to verify Brown and Root's work.

2. Tarapur: Located near Bombay, India, Tarapur nuclear plant has experienced leaking fuel elements, leaking shut-off valves, leaking pump seals, and and erratically operating relief valves. Radiation levels were so high that roughly 1,300 workers quickly reached their maximum exposure levels. Bechtel was a builder of Tarapur. A scientist with the AEC predicted that "there was likely to be a major nuclear disaster in the world and that his prime candidate for it was Tarapur."

3. Trojan: Bechtel designed the nuclear generator for the Trojan plant in Oregon. Two major owners sued Bechtel for a design flaw which caused a nine month shut down. The Control Building's steel frame was generally discontinuous and not anchored to the steel beams and columns of the frame. Bechtel's main defense was a clause in the contract exempting Bechtel from damages arising out of design deficiencies.

4. Palo Verde: Two former employees of Bechtel have made a series of allegations which are under investigation. The allegations include work not done to specifications, falsification of inspection records, hiring of unqualified Brown and Root quality assurance personnel from STNP (later returned to work on STNP as Bechtel employees), and burial of new or minimally used equipment.

5. San Onofre: Bechtel was construction manager. One reactor vessel was installed 180 degrees from its design position. Other breakdowns in quality assurance and construction practices included a lack of design criteria, inadequate inspection and documentation, inadequate installation of a beam in the nuclear vessel containment building, and defective welding.

6. Susquehana: Bechtel was engineer and constructor. Numerous Bechtel employees have come forward to inform the NRC about poor Bechtel construction and quality assurance practices.

7. Palisades, Pilgrim I, Ginna, and Davis-Besse: Bechtel caused numerous errors and breakdowns in each of these plants.

Bechtel is now making a habit of moving in on troubled plants. The utilities apparently are impressed with the number of plants Bechtel has worked on but not particularly concerned with the quality of work actually done at those plants.

Bechtel tests questioned

Compiled from staff and wire reports

The designer of the South Texas Project, San Antonio's hope for future nuclear energy, has been accused of rushing tests at another plant in Phoenix.

Bechtel Power Corp., STP's hired planner, is building the Palo Verde Nuclear Power Plant in Arizona.

Opponents of that plant released affadavits Saturday from two ex-workers who had strong criticism of the way in which the facility is being constructed, according to an Associated Press account.

Wallace R. Royce claimed Bechtel pressured him and his colleagues to complete one test per day, even though some tests should take as long as four days.

Royce and the other worker, Robert D. Gunderson, said the Nuclear Regulatory Commission was ignoring or down playing shoddy work at the Phoenix site.

Spokesmen for Arizona Public Service and Bechtel denied some of the charges but said they would have to study others before they could respond in detail.

The Palo Verde Intervention Fund, which released the documents at a news conference here, said it was forwarding the allegations to the NRC's internal investigations section in Washington.

Gunderson, a 30-year-old journeyman electrician, said he believed it possible that regional NRC staff had informed Bechtel of his concerns, but they had not been corrected.

Royce, a 35-year-old electrical start-up engineer, said NRC investigators substantiated his complaints but took no action when Bechtel fired him in apparent retaliation.

A U.S. Labor Department administrative law judge later ordered Royce reinstated. Bechtel is appealing the decision.

An NRC report on Royce's allegations confirms that a number of start-up engineers felt pressured and that some tests had to be done over, but said none of those interviewed could cite an instance of a deliberately shoddy test.

It also found training had been "inconsistent," as Royce had charged, but said APS had agreed to do a better job in the future.

"No items of non-compliance or deviations were identified," the report concluded.

ATTACHMENT 7

Page 4-A C The SUNDAY EXPRESS-NEWS, San Antonio, February 27, 1983

ATTACHMENT 8

ELECTRIC UTILITIES:

KEY TO CAPITALIZING

THE ENERGY TRANSITION

By Amory B. and L. Hunter Lovins

#3050

ELECTRIC UTILITIES: KEY TO CAPITALIZING THE ENERGY TRANSITION

Abstract

The United States is moving with unexpected speed toward a sustainable energy system based on highly efficient energy use and appropriate renewable sources. The free market, though imperfect, is accomplishing this remarkably well. However, institutional barriers are causing underinvestment in money-saving energy options. This retards the energy transition far below an economically efficient rate, prolonging dependence on dwindling fuels.

Each year, electric utilities spend about the same amount of money that efficiency and renewables are lacking—some $25 billion—to build giant power stations which cannot compete in the energy service market. This Federally supported misallocation of capital is bankrupting the utilities and threatening the stability of the whole financial system. So long as half America's energy investment goes into uneconomic power plants, their cheaper rivals will be smothered.

If, however, utilities invested only in the best energy buys (as several states already mandate), power plants would no longer be built. This "least-cost test" should be coupled with a program of utility loans, properly structured on proven principles. Such loans would enable utility customers to buy any energy option which costs less than new power plants; give all energy users fair and equal access to capital; offer an escape from high energy bills; and rescue utilities from insolvency. Indeed, such a program would automatically transform the utilities from an obstacle into a vehicle for financing the transition to sustainability. The benefits of a secure, affordable, equitable, and environmentally benign energy system could then be achieved before the fossil-fuel bridge to it has been burned. And electric utilities' adaptation could help guide other beleaguered institutions toward sustainability.

ELECTRIC UTILITIES: KEY TO CAPITALIZING THE ENERGY TRANSITION

America has begun the decades-long transition from wasteful to efficient energy use and from depletable to sustainable energy sources. Since 1979, the United States has gotten more than a hundred times as much new energy from savings as from increased supply[1]; and of that increased supply, the largest part has come from renewable sources, now over seven percent of total U.S. energy use[2]. The energy used per unit of GNP has fallen by a fifth since the Arab oil embargo, and is still declining by four to five percent per year.

By the end of this century, the United States could wring twice as much work out of its energy, and get at least a third of that energy from renewable sources[3]. The nation could thus reduce its energy use by a fourth and its use of nonrenewable fuels by nearly half. This could occur even if GNP meanwhile increased by two-thirds, and indeed such rapid economic growth could hardly be financed without the several trillion 1980 dollars' net savings in fuel and capital costs which the energy saving would yield[4]. Conversely, more thoughtful goals than mere indiscriminate swelling of GNP would yield even greater savings in energy and money.

Price is driving the transition. Conventional oil products now retail at about forty to fifty dollars per barrel. Energy saved by more efficient use costs about zero to twenty dollars per barrel; well-designed renewable sources can now deliver a "barrel" for about five to thirty dollars. The alternatives—such as synthetic fuels at over seventy dollars per retail barrel, and electricity from new coal or nuclear power plants at about twice that price—are even less competitive than imported oil[5]. Efficiency and renewables are simply winning the market's sweepstakes for the best buys—the cheapest ways to do each desired task.

Yet far greater energy savings are technically feasible and economically worthwhile. Available, cost-effective technologies can double the efficiency of industrial motors[6] and steel mills[7], triple that of airliners[8], quadruple that of household appliances[9], quintuple that of cars[10], and improve that of buildings by ten- to a hundredfold[11]. Just in this decade, weatherizing buildings and starting to replace gas-guzzlers by efficient cars could more than eliminate all U.S. oil imports—before a power statio[n] or synfuel plant ordered now could deliver any energy whatever, and at a tenth the cost[12].

In time, economics would achieve all this. But time is of the essence. In 198[0] alone, oil imports drained nearly $90 billion out of the American economy—equivalent to the total net assets of General Motors, Ford, General Electric, and IBM. Communities across the country send thousands of dollars per household per year out of the local economy to pay for energy[13]. Globally, a half-trillion dollars' uncollectable debt—much of it to buy oil—has virtually halted development and threatens financial chaos. The climatic risks from coal[14] and the proliferation risks from nuclear technology[15] become ever less tractable. The intertwined social, economic, and environmental problems of reliance on dwindling fossil fuels are already critical. Those relatively cheap fuels which America still enjoys (and the relatively cheap money made from them) can form a bridge to a sustainable energy future. But as those fuels are burned, and the money spent on ways to burn them even faster, the transition is made more difficult.

Investment is starting to shift towards efficiency and renewables. In 1980, Americans invested nearly $9 billion in efficiency[16] and $6 billion in renewables[17]. This $15 billion total was about a fifth of all energy investments. But serious imperfections are preventing the market from quickly reallocating capital to acknowled[ged] best buys:

- Information. Most people do not know what opportunities are available or where to find them.
- Split incentives. Why should a landlord stuff up the cracks around the windows if the tenants pay for the heat? Why should the tenants fix up someone else's building? Why should a builder make a house cost more to reduce the buyers' long-term running costs?
- Local policies. Obsolete building and zoning codes, lending regulations, utility practices, and many other laws and habits left over from the

cheap-oil era are artificially inhibiting choice and restricting competition.

- Federal policies. Federal price and tax rules distort price signals: biased subsidies favor nonrenewable energy sources by about ten to one[18].
- Lack of access to capital. The opportunities for efficiency and renewables are dispersed in hundreds of millions of buildings, vehicles, and machines. Most of their proprietors pay top interest rates; many are fighting for their economic lives; some are redlined. There is no mechanism to get energy investment capital quickly enough into the millions of hands that can spend it best.

This last barrier is arguably the most entrenched and important: capital is an absolute prerequisite for fixing up or replacing obsolete equipment. But today's energy financing machinery is attuned to energy companies, not to their customers. It dispenses dollars by the billions, not by the thousands or hundreds: major financiers say a million dollars is hardly worth the paperwork. Institutional rewards, psychological patterns, and Federal policies all tend to centralize and ration capital away from dispersed investments, however meritorious.

For these reasons, 1980 investments in least-cost energy options were about seven times smaller than would have been cost-effective[19], and less than half of the average rate (about $40 billion per year[20]) needed over the next twenty years to start making the U.S. energy system sustainable. Our nation is falling about $25 billion per year short of securing its energy future.

Breaking down the barriers—especially providing consumers with equitable access to capital—will provide the market momentum to meet America's energy challenge. This essay analyzes a way to do this by correcting the dangerous misallocation of capital to and by electric utility companies—simultaneously turning them from obstacles into vehicles of the energy transition.

Electric utilities and the misallocation of capital

While efficiency and renewables suffer from too little capital, electric utilities (here called "utilities" for short[21]) suffer from too much, in about the same amount. Virtually all of the $25 billion-odd per year that utilities are currently spending to build huge power stations and their supporting facilities is wasted—a series of milestones in a blind alley. That overinvestment threatens their own survival and that of the whole financial system.

Utilities are the largest single sector of the U.S. economy, with net assets of about $250 billion[22]. They issue half of all new industrial common stock and undertake a third of all corporate financing[23]. In 1980, they received more than $6 billion in direct Federal subsidies[24]; sold stocks and bonds for over $18 billion; and accumulated more than $12 billion internally. They spent the proceeds, nearly $37 billion, on construction[25]: half of all U.S. energy investment, or nearly a fifth of the total investment by all American industry[26].

Utilities burn a third of all fuel fed into the U.S. energy system—more than any other sector. Two-thirds of that input, or nearly four-fifths as much energy as the entire industrial sector uses[27], is lost in utilities' conversion and distribution. Official projections show two-thirds, perhaps five-sixths, of all the growth in American energy use to the year 2000 going to warm water and cooling-tower plumes discharged by new power plants—lost before it ever gets to consumers[28].

Giant power plants are becoming costlier far faster than general inflation[29]. They rely on depletable fuels. They take about ten years to build, and pay back in decades if ever. Efficiency and renewables, in contrast, are generally becoming cheaper, typically take days or weeks to install, and repay their investment in a few years[30]. Most efficiency improvements are only about as capital-intensive as the old oil, gas, and coal systems on which the U.S. economy was built, and most well-designed renewables are only modestly more so[31]. In contrast, modern electric power systems are about a hundred times that capital-intensive[32]—more so than any other sector. Power stations indeed draw so much capital away from the rest of the economy that each big plant built loses the country, directly and indirectly, about four thousand net jobs[33], whereas efficiency and renewables greatly increase and disperse sustainable employment.

Nonetheless, central power plants now under construction are tying up well over

$50 billion, increasing the utilities' debt (over $140 billion) and interest payments (about $13 billion in 1980). The drain of money from ratepayers (currently some $125 billion per year), from individual utilities[35], and from the national economy forecloses alternatives. Plants intended to save a little oil and gas tomorrow[36] are helping to create a shortage of capital _today_. Such massive expenditures _slow down_ oil displacement by starving other measures, such as fixing up buildings and cars, that would save more oil faster and cheaper[37].

Yet utilities say they _must_ achieve a 1970s-style "healthy" increase of at least three percent annually in electrical demand, by spending $35 billion per year through 1990 and about $1 trillion in total by 2000[38]. Is that really the key to greater prosperity, or a hemorrhage of economic lifeblood away from sustainable energy investments?

The symptoms of insolvency

The capital marketplace is concluding, as utility expert Irvin C. Bupp puts it[39], that "The business of generating electricity has ceased to be a commercially viable enterprise." Cost-squeezed utilities have already cut their forecast growth in half. In the greatest collapse of any enterprise in industrial history, over half the new power plants planned for the 1980s were delayed or cancelled in one year[40], and since 1975, nuclear cancellations have outstripped orders by more than six to one[41]. Yet, rejecting Wall Street's verdict, many utilities have continued to overspend themselves into insolvency, typically borrowing short-term to pay dividends. Sixteen big utilities now have under four cents' cash reserves per dollar of short-term debt[42]; many have a decade's net income, and up to centuries' retained earnings, tied up in some huge construction project that may never be finished.

The financial rot began in the 1970s, when utility common stock fell to a fifth of its inflation-corrected 1965 value[43] (less than current book value[44]), bond ratings plummeted from AA toward BBB+[45], net income became half fictitious[46], return on equity _fell_ by nearly six percent (not counting the loss from faster inflation)[47], and yet construction expenditures rose eight times as fast as cash earnings[48]. Maintaining residual investor confidence now requires dividends consuming four-fifths of net earnings--dividends sometimes paid, for example, by floating unsecured Eurodollar notes, at upwards of eighteen percent annual interest, in the Dutch Antilles.

Mounting concern that one or more major utilities may soon go visibly belly-up[49] is highlighting their threat to the national economy. Utility paper is built into the very foundations of America's highly leveraged financial pyramid--insurance companies, banks, pension funds, mutual funds. Some analysts say privately that a collapse in the perceived value of that paper may crash the entire financial system. At least one regional Federal Reserve office is already wondering how to rescue local banks, submerged in dubious utility investments.

To understand how modest institutional changes, already proven practical, could prevent such disaster to the country, the utilities, and their customers, we must now probe beneath the surface of the utilities' financial predicament.

<u>The roots of insolvency</u>

Utilities are regulated franchise monopolies[50]. The law obliges them to meet electric demand, and entitles their investors to a "fair" rate of return. But that return must come from voluntary purchases of electricity, subject only to <u>economic</u> laws.

There is no demand for electricity <u>per se</u>: raw kilowatt-hours are not a useful commodity, but only one of many means to an end. The real demand is for the <u>services</u> energy provides: comfort, light, mobility, ability to run an arc-welder or sewing-machine. Many options compete to provide energy services: electricity, higher energy productivity, directly used fuels, and renewable sources. In an increasingly free market, people can be expected to choose the amount, type, and source of energy that will provide each desired service at least cost.

This may, however, mean buying <u>less</u> electricity, for it is a high-quality, extremely expensive form of energy: in heat terms, about $100 per "barrel" today (triple the world oil price) and nearer $150 per "barrel" incrementally[51]. Such costly energy may be worthwhile for such premium uses as lights, motors, smelters, subways, and appliances--eight percent of America's delivered energy needs. But it is fundamentally uneconomic for the other ninety-two percent--providing heat and running non-rail vehicles.

Though only eight percent of delivered U.S. energy needs can economically justify electricity, thirteen percent receive energy in this form (and sixteen percent would if all power plants could sell their output). The difference, five-thirteenths of all electricity sold, is spilling over into uneconomic uses: space-conditioning and water-heating. Electricity from additional plants could only be so used—as if someone who cuts butter with a chainsaw were to buy a second chainsaw rather than a butterknife.

Because the premium markets for electricity are filled up twice over, debating which new power station to build is like shopping for the best buy in brandy to burn in your car or for Chippendales to burn in your stove. Regardless of what kind of new power station yields the cheapest electricity, no kind can nearly compete with the real competitors—the cheapest ways to provide the same energy services, such as comfort[53]. Those real competitors include weatherstripping, insulation, greenhouses, heat exchangers, and window-shading and -insulating devices. Intelligently bought, they typically cost a few tenths of a cent per kilowatt-hour. Since this is less than the running costs alone (one to two cents) for even a new nuclear power plant, the country can save money by buying efficiency and writing off newly built power plants[54].

Power plants, old and new, must—but cannot—compete with an immense array of options: not lighting empty offices at headache level; replacing electric heating and cooling with good architecture; new light-bulbs that cut power needs fivefold and life-cycle costs fourfold[55]; industrial motor improvements that could displace every U.S. reactor[56]; refrigerators that use sixty to ninety-five percent less electricity[57]; industrial cogeneration (a bigger and cheaper source than all today's oil, gas, and nuclear plants[58]); small hydro and windpower (more such capacity has been ordered since 1979 than coal or nuclear plants or both[59]); and many more[60], soon to be joined by competitive solar cells[61]. No wonder, in "least-cost energy strategy," it is seldom worthwhile finishing building power plants now under construction![62]

If for the next two decades we had rapid economic growth and bought the cheapest energy options, utilities would sell not ninety percent more electricity as they plan, but twenty-five percent less[63]. The U.S. could thus commission no new power plants after 1985, and by 2000 could retire all old, oil- or gas-fired, and nuclear plants, and yet could still have a national surplus of generating capacity[64].

Most utilities, for a variety of spurious reasons[65], are planning for just the opposite. During 1974-79, private utilities' forecasts of peak demand one year ahead overstated actual growth by one hundred sixty percent. American utilities thus have one-third more generating capacity than peak demand (roughly twice the prudent "reserve margin")—expected to rise to nearly one-half through the 1990s[66]. Yet their advertisements say they must build far more: the stark choice is rate hikes or blackouts. Those rate hikes "needed" to finance new and past[67] construction, however, would make the plants even more patently unnecessary by making electricity even less competitive.

Individual utilities show this in their own overbuilding. By the time a new plant is finished, higher rates meanwhile will have led people to economize[68]. The utility, selling less electricity than expected, will have too little revenue to pay for the plant, requiring still higher prices. This will further dampen demand, leading further into the "spiral of impossibility"[69].

Nationally, at average 1978 prices, at least forty-three percent of all electricity sold in the U.S. was uncompetitive with efficiency improvements[70]. Today that figure is probably above eighty percent[71]; at the higher prices utilities want, higher still. Indeed, if long-run electric demand is as sensitive to price as many analysts now suspect[72], higher prices may actually reduce utilities' revenues by dampening demand more than price rises. If this happened, new construction would both require more revenue and produce less—a recipe for bankruptcy.

Many utilities nonetheless continue to liquidate themselves to build more plants that they don't need and can't afford, playing "You Bet Your Company" that their customers will not switch to better buys. Utilities' proposed solution to insolvency—higher rates—is, however, like trying to bail out Chrysler by raising its sticker prices[73]. That doesn't help Chrysler to compete with Datsun, nor electricity to compete with weatherstripping.

The Federal government's solution—greatly increased subsidies[74] to utilities which, in 1980, already paid only a sixtieth of the statutory tax rate[75]—enhances cashflow and investment in the short run[76], but makes the utilities crash harder a few years later, by further inflating construction beyond their ability to amortize it from revenues. Indeed, past subsidies[77] have led utilities down the path to ruin by making new electricity look only about half as expensive as it really was[78]. Consumers, not knowing what it really cost, could not know how much was enough, so they grossly underinvested in electrical productivity. This artificially puffed-up demand led utilities to build some $100 billion worth of unnecessary, uncompetitive thermal power plants[79]—which, over the next few decades, they will somehow have to write off[80].

Utilities' survival requires desubsidization, stable (if not declining) prices, and investments that need far fewer dollars and pay them back far faster than power plants. Efficiency and renewables can meet these requirements and deliver needed energy services—if bought instead of uneconomic power plants, not in addition to them. How, then, can utility investments grasp these opportunities for corporate solvency and national sustainability—rather than crashing and taking the financial system with them?

Utilities as financiers

Financing the energy transition will need many institutions[81]. But utilities have three advantages in taking a sizeable share of this new market: they already invest about as much money as is needed to bring the energy transition to maturity; they already have a billing relationship with nearly everyone; and they have a strong incentive not to go broke.

Well-managed private utilities, and the American Public Power Association, already view themselves as purveyors, not of electricity, but of energy services (or the financial means of acquiring them). Realizing what market they are competing in, utilities must next avoid investments that cannot compete, notably new power plants. Irwin Stelzer, doyen of utility economic consultants, warns[82]:

> In my view, it is risky to set a conservation goal first, and then at some later date cut the construction program [because one can overbuild meanwhile]. I prefer [to]...cut the construction budget FIRST on the assumption that conservation goals will be met, and then try to find ways of reducing the growth in demand so that you won't be caught too short of capacity in the short run.

State regulatory commissions also have an "obligation to scrutinize capital budgets" to "make sure that investment is absolutely required in the public interest"[83]. Most commissions already require proof that proposed power plants are "necessary"[84]. That should logically depend on comparative economics. An economic "investment balancing test," pioneered in California, is now Federal law in the Pacific Northwest, and the concept is spreading rapidly[85].

Under this test, the utility must show that the plant it wants to build is the cheapest way to provide incremental energy services. If so, there is a good case for building it, subject to other legal requirements; but if not, the utility, instead of building the plant, should loan out some of the same money to its customers of all classes, on mutually advantageous terms (outlined below), so that consumers can do the cheaper things first. To keep the test honest, a utility which passes it and builds the plant would be allowed to charge its customers for no more than the inflation-corrected plant cost which it assumed when comparing the proposed plant with alternative

Investors in the marketplace cannot justify spending more than the cheapest option costs, even though (like regulated natural gas) its price may be artificially held far below replacement levels. Conversely, society saves money by buying any option cheaper than a costly alternative (such as a new power station) which would otherwise have to be built instead. The investment balancing test compares all options with the long-run replacement cost of energy represented by that power station; anything cheaper qualifie for utility financing, regardless of any distorted prices that might be in the marketplace. The test allocates capital in an efficient way which could not be achieved through the market alone without first pricing energy far beyond poor people's means[86].

The utility's loans will benefit itself <u>and</u> its customers if properly structured:

- The utility should charge interest at its own cost of money (after any subsidy). Thus the utility is not unfairly burdened, and is not subsidizing loans, yet all energy options have equal access to capital (and to any government subsidies) so they can compete fairly.
- Borrowers should spend the money at their own discretion for any measure that will provide energy services more cheaply than the foregone power plant-- preferably giving priority to measures that pay back soonest.

- Borrowers should repay the loans only out of their energy savings[87]. If the utility loans $4,000 to insulate your house, reducing your energy costs by $1,000 per year, then you repay only $1,000 per year (or slightly less). Within five years, you have paid off the principal and interest. Meanwhile you need no money up front, and your utility bill is no greater than if you had done nothing. Afterwards you pay less, permanently, because you are getting more comfort per dollar and the utility is avoiding new construction.
- The utility, while participating at arm's length in secure, high-return investments, would not own, lease, install, control, or specify them. Consumers can be protected from fraud[88] without thrusting utilities into unfamiliar or potentially anticompetitive businesses.

The nature of the new investments is such that they would typically require about a tenth as many dollars (per unit of delivered energy service) as the power plant they replaced[89], and would repay those dollars in three or four years, not thirty or forty. These effects multiply, reducing the utilities' need for investment capital by up to a hundredfold while providing unchanged services. Many utilities could thus "bootstrap" the loans from their own cash retained earnings—money generated by older assets which were financed relatively cheaply. To the extent that a utility can stretch those internally generated funds, and hence avoid having to raise very costly new money by selling more stocks and bonds, it can loan at close to its old ("embedded") cost of money—typically an annual interest rate around eight or nine percent, far below bank rates.

Would banks resent this competition for a type of loan business (such as home improvements) which does not normally excite them? Probably not, for two reasons:

- Banks would be protecting their own precarious utility holdings.
- Mortgage-holders, now able to escape spiralling energy bills, would become less likely to default and stick the bank with energy-guzzling houses nobody can afford to live in.

On its own books, the utility would treat the revolving loan fund "below the line"--as a separate kitty, neither in the "rate base" of investments on which ratepayers pay a return nor passed through to them as an expense[90]. Every dollar transferred from power-plant construction into the rapidly revolving loan fund would become many times as valuable[91], reduce financial risk, and reduce the need for costly new money, increased debt, and greater dilution of stockholders' equity.

As utilities cut their losses by abandoning partly built plants, the state commission would probably follow the usual practice[92] of making ratepayers, over perhaps a decade, give investors their money back with no return—painful, but only about a twentieth the cost ratepayers would otherwise ultimately have to eat[93]. Simultaneous rate reform should try to make incremental consumption pay true incremental costs, while the whole energy sector is being systematically desubsidized[94].

The investment balancing test would halt the utilities' cash hemorrhage—construction—and make them relatively healthy (as Consolidated Edison showed by rebounding from near-bankruptcy to wealth during 1974-80). The loans would put utilities into a business with short construction times and fast paybacks, eliminating the cashflow instability that threatened overbuilding unto insolvency. Over the next half-century, as the utility evolved into a distribution service akin to the telephone company, connecting many dispersed users and sources, it would have a valuable task which it could do well and feel good about.

Implementation

Overbuilding has so drained some utilities that they have no cash left to capitalize a revolving loan fund. Initial capital could then come from a ten- or twenty-year public-sector loan, akin to the $500 million of Oregon and California bond issues already financing sustainable energy investments and enterprises[95]. Alternatively, a state utility commission might allow slight excess revenue, perhaps from high-demand customers, for just a year or two to get the loan fund running.

Utility loans for cheaper energy-saving investments are already proven. Michigan Consolidated Gas Company, years ago, found it cost less to insulate a hundred thousand Detroit houses than to find new gas. Since we first proposed electric utility loans in spring 1978[96], utilities with over two-fifths of national generating capacity have set up loan programs and proven that saving electricity is far cheaper than making it[97].

Many loan programs are surpassing expectations. By February 1982, the Tennessee Valley Authority had lent $185 million at zero interest to insulate a tenth of Valley houses, simultaneously reducing nominal installation costs by a sixth in one year[98]:

> These programs are an integral and important part of our power supply planning, helping us defer the need for $3,000+/kW new capacity and the rate increases that would inevitably be associated with it. They also bring immediate [financial] relief to our customers through lower consumption, and thus are a key part of the [regional development] service we...provide.

Southern California Edison Company announced in 1980 that it now views efficiency and renewables as the best buys, and is to get thirty percent of its power from alternatives by 1990[99]. Even without a comprehensive loan program, Duke Power Company is so far ahead of its 1990 peak-load saving goals that it has quadrupled them, and expects in the next decade to avoid the need for four to five nuclear plants costing over $10 billion[100]. Many Northwest pioneers of utility loans continue to finance savings at under a fifth the cost of new plants[101]—benefitting even under such generous terms as no repayment for ten years or until the house is sold.

This is not to say that there are no problems with utility loan programs. Most are inefficiently structured. Loaning money at low or zero interest, they must subsidize its cost, often by putting the loan (or its extra interest cost) into the rate base. Since all customers then pay, a "no-losers" test is needed to avoid penalizing non-participants. This restricts customers' investments to a small part of the utility's replacement cost represented by the foregone power plant. It also splits the incentive to invest efficiently from the parties (such as householders) making the investment, and can promote inefficient investment. By neither rate-basing nor subsidizing interest rates, our proposal avoids these defects; and it does not restrict investments to a short, often obsolete, list of specified items.

Managers of successful loan programs have no regular forum to compare notes with others, especially those whose utilities lack widespread public confidence and wonder how to earn it back. Poorly managed utilities are actually getting Federal encouragement to delay or oppose efficiency investments or give them mere lip service[102]. Statutory utility house-auditing programs have been administratively gutted, and the courts have had to order the White House to stop impounding repeated appropriations for the new Conservation and Solar Bank, designed to fill gaps in utility loan programs.

Nonetheless, utility managers, regulators, and investors across the country have found our concept financially and politically attractive. It offers consumers, especially those with low income, a way out from high energy costs. It stabilizes the utility's prices, cashflow, and competitive prospects. It avoids the further dilution of stockholders' equity and helps protect bondholders from defaults. It reduces utilities' financial risks[103] and cost of money, enabling them to join, rather than fight, the trend toward investments with typical pretax returns upwards of thirty percent per year. And though Federal action could facilitate implementation, all the essential parts—all those except desubsidization—can be done at a state level, often with existing laws and nearly always with existing institutions.

Municipalities can even implement their own loans through an existing municipal utility or otherwise. Thus Minneapolis expects to reduce heating energy thirty percent by weatherizing all five thousand blocks of the city in three years, via a $10 million municipal Energy Bank financed by local banks, the gas utility, and municipal bonds[104]. Oceanside, California has raised $24 million in private venture capital for its municipal solar-and-conservation utility, marketed as a tax shelter: consumers pay low solar lease fees (eligible for the state solar tax credit), and the city even gains net revenues[105]. Other such examples abound[106].

Exciting opportunities to combine utility loan programs with other innovations in rate reform, desubsidization[107], power brokerage[108], and the like remain largely untapped. But other new concepts are being tried:

- Utilities in at least four states[109] are "buying back" <u>saved</u> electricity just like self-generated electricity. Their payment can sometimes be applied to the capital cost of the electricity-saving device.
- Some utilities are splitting electricity savings with third-party private investors. Suppose that a power-short smelting company finances improvements in an office complex, saving X kilowatt-hours at one cent each. The company then buys X kilowatt-hours from the cash-short utility at an arbitrated price of three cents each, instead of the eight cents it would otherwise have had to pay.

For each kilowatt-hour saved and transferred, the smelting company saves four cents; the utility has a comparable profit to share with its ratepayers and stockholders; and the building occupants enjoy permanently reduced utility bills.

- Alternatively, the investor can contract to supply the building occupants' energy services (such as lighting and comfort) at less cost than they now pay, then pocket the difference. "Energy service companies" and some unregulated utility subsidiaries now do this.

Still other concepts remain to be tested. Where state law permits, for example, a utility customer whose electrical demand is permanently reduced via alternative investments might sell the utility a "peak-load easement"[110]. This could become part of the utility's resource plan, and could even be remarketed like an abatement of air pollution under the EPA's "bubble" concept.

Utility programs could also help provide the current and accurate information markets require. Utilities could even administer loan programs for renters, such as the one Citizens' Energy Corporation now runs in Boston. Under this scheme an initial deposit in a local bank provides collateral for weatherization loans to landlords. Tenants' savings are then paid to the Corporation, which gives the landlord half for loan repayments to the bank and gives the tenants half for low-cost/no-cost investments.

More variations will emerge as healthy experimentation refines the loan concept. The critical choice before the utilities, however, is not whether, but only how, to redirect their investments into more competitive channels. Others will invest in the best buys, with or without utilities. The utilities' choice is only between participation and obsolescence.

National benefits

A detailed government analysis has shown that by investing about $755-790 billion[111]—essentially the plan outlined here—the United States could, by the year 2000,

- essentially eliminate the need for new power plants costing $1 trillion;
- eliminate oil imports (over $70 billion in 1981 alone) and, if desired, nuclear power;
- leave $1-2 trillion worth of coal, oil, and gas in the ground;

- avoid the social costs of mining, transporting, and burning those fuels;
- more than double national energy efficiency; and
- make national energy supplies at least one-third renewable.

The $1 trillion in avoided power-plant investments would save utilities over $30 billion per year now, rising to $75 billion per year by 2000—nearly all from Wall Street.

Utility customers would get to keep more than $10 billion per year, starting now, for additional electricity they would no longer need (because efficiency improvements did the same tasks cheaper) and for subsidies to build the plants. Additional savings from present electrical use would save more money—rising steadily to more than $30 billion per year by 2000. Consumers' direct savings would thus total, on average, more than $25 billion per year. In addition, utility loans at attractive interest rates could supply more than $10 billion per year[112]. Thus just lower electric bills and utility loans would offer consumers some $35 billion per year—about nine-tenths of the total (up to $40 billion per year) needed to achieve the national goals above. Meanwhile, more than $50 billion per year in direct fuel savings (including investments in wells, pipelines, refineries, mines, railroads, etc.) would also stay in consumers' pockets or in the capital marketplace. Thus the United States could almost entirely finance the transition toward a sustainable energy system, without drawing significantly on at least $1 trillion of fuel savings which would still be available for reinvestment elsewhere. And this reallocation of capital could, as separate analyses document, bring a constellation of other national and global benefits[113].

Not least of these is the heuristic value of seeing a major industry use new market opportunities to escape collapse as the economics of depletion, pollution, scale, and technological progress shift its incentives and its self-image. The lessons of the utilities' rapidly evolving transformation foreshadow, and can aid in, a wider global shift of capital and institutions. Just as utilities are changing from vendors of kilowatt-hours to financiers of least-cost energy investments, so other industries will be driven by market forces (or prudent planning) to shift from resource-consumptive to resource-conserving activities; from resource extraction to resource productivity (e.g. in water, soil, and minerals); from an economy of flows to one of stocks[114]; and from an economy of means to one of ends. The quarter-trillion-dollar utility business—among our largest, most powerful, and most embattled institutions—can, by adapting in its own self-interest, help to guide others toward sustainability.

* * *

Notes

[In the few instances where a secondary source is cited, it contains an up-to-date bibliography too extensive or technical to list fully here.]

1. That is, GNP rose over a hundred times faster than net primary energy demand—a shorthand version of "savings" which aggregates lifestyle changes (usually minor), shifts in composition of output, and the technical increases in energy productivity with which this paper mainly deals.
2. Resource & Technology Management Corp. (Arlington VA), Alternative Energy Data Summary for the United States, Vol. 1, 1975-80 (1981).
3. Solar Energy Research Institute, A New Prosperity, Brick House (Andover MA, 1981).
4. Id.
5. R. Sant et al., The Least-Cost Energy Strategy (1979) and Eight Great Energy Myths (1981), Energy Productivity Center (Arlington VA); for further cost documentation, A.B. & L.H. Lovins, Brittle Power: Energy Strategy for National Security, Brick House (Andover MA, 1982), at App. 3.
6. Documentation in Lovins & Lovins, id., p. 415, nn. 5[illegible]-55, and in A.B. & L.H. Lovins, F. Krause, & W. Bach, Least-Cost Energy: Solving the CO_2 Problem, Brick House (1982), at p. 55. Practical efficiency including drive train is doubled.
7. S. Eketorp et al., Framtide Stålverket, 3 vols., Küngl. Tekn. Högskolan (Stockholm, 1981).
8. See Lovins et al. (1982), ref. 6, pp. 49-50.
9. J.S. Nørgård, Husholdninger og Energi, Polytekn. Forlaget (København, 1979).

10. Ref. 8, pp. 43-47: a 1981 prototype Rabbit did 80 mpg city, 100 highway.

11. Id., pp. 31-43.

12. C. Schneider, Congr. Rec. E2512, 21 May 1981.

13. Lovins & Lovins, ref. 5, pp. 305-309.

14. Ref. 8 and citations.

15. A.B. & L.H. Lovins, Energy/War: Breaking the Nuclear Link, Harper Colophon (NY,

16. Business Week, pp. 58-69, 6 April 1981.

17. Data from Renewable Energy Institute (Washington DC) and RTM (Ref. 1).

18. OMB, FY1982 Budget, Special Analysis G, Table G-3; Congressional Budget Office (
Tax Expenditures: Current Issues and Five Year Budget Projections for FY 1982-19

19. Sant et al., ref. 5.

20. Ref. 3.

21. Public and private (78% of electrical sales).

22. Private utility data from Edison Electric Institute (Washington DC), Statistical Yearbook/1980, corrected for public utilities.

23. USDOE, Energy Information Administration, Impacts of Financial Constraints on the Electric Utility Industry, DOE/EIA-0311 (1981), at A-1.

24. Ref. 3, p. 9 (GNP deflator), with actual 1980 data on investment tax credit and accelerated depreciation (Ref. 22).

25. T. Dillon (USDOE), "Nuclear Economics," speech, 15 June 1982.

26. Id.; Ref. 23.

27. USDOE, Energy Information Administration, Monthly Energy Review, DOE/EIA-0035 (82 06) (June 1982), pp. 20-23.

28. USDOE, "Security America's Energy Future: The National Energy Policy Plan," DOE/S-0008 (1981), p. 21.

29. C. Komanoff, Power Plant Cost Escalation, Ballinger (Cambridge MA, 1982).

30. Ref. 5.

31. A.B. Lovins, Ann. Rev. En. 3:477-517 (1978); Ref. 3 & 5.

32. A.B. Lovins, Soft Energy Paths, Harper Colophon (NY, 1977); Science 201:1077-1078 (1978), 204:124-129 (1979).

33. B. Hannon, "Energy and Labor Demand in the Conserver Society," Center for Advanced Computation, U. Ill. (Urbana/Champaign, 1976).

34. Lovins & Lovins (Ref. 5), p. 419, nn. 61-62.

35. P. Shenon, "Excess Energy," Wall St. J., p. 1, 9 October 1980.

36. V. Taylor, "Electric Utilities: The Transition from Oil," 9 December 1980 testimony, USHR Commerce Committee; Ref. 15, pp. 39-45.

37. Ref. 34, pp. 255-259.

38. USDOE, DOE/PE-0041 (February 1982); Electrical World, 31st Annual Forecast, 15 September 1980; 1980 dollars.

39. Business Week, 28 May 1979, p. 108.

40. USDOE (Ref. 38), p. 15.

41. A. Reynolds, Energy Information Administration, personal communications.

42. M. Weiss, Money & Markets (W. Palm Beach FL), 23 July 1982.

43. C.A. Benore, at p. 20 in California Public Utilities Commission (San Francisco), Energy Utilities: The Next 10 Years, 1982.

44. Thus new stock sales confiscate existing stockholders' assets.

45. R.J. O'Connor, at S-4 in Nucleonics Week's Special Supplement (April 1982), "Nuclear Commerce in the 80's."

46. I.e. made of "allowance for funds used during construction" (AFUDC), a non-cash income item meant to reflect the earning potential of partly built plants.

47. Ref. 43, at p. 22.

48. Ref. 23, at p. A-14.

49. J.R. Emshwiller, "Plunging Power," Wall St. J., p. 1, 2 February 1981.

50. Partial deregulation is theoretically attractive (though messy in practice); fuller competition is a good substitute (I.M. Stelzer, "The Electric Utility Deregulation Debate," speech, 21 September 1981, at p. 15).

51. I.e. about 6¢ and 9¢ per kW-h delivered, comparing the heat content of a kW-h (3413 BTU) or barrel (5.8 million BTU) without regard to the conversion efficiency of either. Taking that efficiency into account yields the conclusions following.

52. Ref. 5; A.B. Lovins, 14 August 1981 surrebuttal testimony to Pennsylvania Public Utility Commission, Limerick Investigation, docket #I-80100341, which shows that even super-efficient electric heat pumps are uncompetitive.

53. *Id.*; Refs. 3 & 11.

54. Ref. 15, pp. 47–49.

55. F. Krause, *Soft Energy Notes* *5*(2):34ff (San Francisco, 1982).

56. Ref. 6; Ref. 15, p. 62, n. 116.

57. H.R. Holt (USDOE), "High Efficiency Refrigerators: Recent Developments," 1982.

58. R.H. Williams, *Ann. Rev. En.* *3*:313–356 (1978).

59. Ref. 8, pp. 226–227.

60. E.g. Ref. 15, p. 53.

61. USDOE expects these to compete on most grids by 1986: Ref. 8, p. 427, n. 24.

62. Sant *et al*. (Ref. 5).

63. Ref. 3, p. 327, line v.

64. Calculated from data *id*.

65. A.B. Lovins, *J. Bus. Admin.* (Vancouver) *12*(2):91–114 (1981); "How To Keep Electric Utilities Solvent," 26 February 1981 memo to Treasury Secretary, as revised in *The Energy Journal* (Tucson), January 1983, in preparation.

66. Ref. 23, p. 19.

67. *Id.* at 7.

68. Ref. 65; *The Times* (London), p. 1, 1 March 1980.

69. *Id.*; A. Ford & A. Polyzou, "Simulating the Spiral of Impossibility in the Electric Utility Industry," LA-UR-81-3343, Los Alamos National Laboratory (1981).

70. Sant (Ref. 5, 1979).

71. From a fuller reckoning using data documented in Lovins *et al*. (Ref. 6, 1982).

72. Ref. 65; Philadelphia Electric Co., Exhibit WCH-1, pp. 28-29, in Ref. 52 case; Ref. 42.

73. This comparison is due to Sant's colleague D. Bakke.

74. D. Morris, at p. 73, *Solar Age*, April 1982; Ref. 23, p. A-27f.

75. Ref. 23, p. A-28 ($0.6 billion tax on $80 billion revenue).

76. Thus utility stocks rose 17-18% in the year ending April 1982—though still well below book value.

77. C. Davis, 4 Harv. Env. L. Rev. 311-358 (1980).

78. Via tax subsidies and rolled-in pricing: D. Chapman, Cornell University.

79. Assuming unitary own-price elasticity of demand.

80. Ref. 65.

81. Already aomprising some oil companies (including the Shall Group's most profitable subsidiary), insurance companies (notably Equitable), banks, municipalities, public solar-and-conservation utilities, private industries, secondary markets, and new investment vehicles.

82. At 152, California Public Utilities Commission (San Francisco), Energy Efficiency and the Utilities: New Directions (1980). See also 141 id.

83. Id., p 165.

84. Via a Certificate of Public Necessity and Convenience, or equivalent.

85. E.g. in Vermont and Connecticut. Idaho even requires that efficiency and renewable opportunities be exhausted first regardless of price.

86. See also A.B. Lovins, "How To Finance the Energy Transition," Not Man Apart (San Francisco), pp. 8-10, mid-September/October 1978, republishing Washington [DC] Star op-ed, 2 April 1978.

87. This "graduated-payback" system was developed by TVA.

88. E.g. by TVA-style conditioning of labor payments on inspection, and by consumer information feedback programs.

89. Refs. 3, 5, & 6.

90. The small transaction costs might be expensed.

91. E. Kahn et al., "Commercialization of Solar Energy by Regulated Utilities: Economic and Financial Risk Analysis," LBL-11398, Lawrence Berkeley Laboratory (1980).

92. American Bar Assn., 12 Nat. Res. L. Newsl. 11-12 (January 1981).

93. I.e. $50 billion under construction vs. $1 trillion more proposed.

94. See Refs. 65 & 77, especially the Batinovich plan. Accelerated depreciation of power plants has accumulated $15 billion of deferred utility taxes which fall du growth slows, but would otherwise have been deferred indefinitely or paid in hi inflated dollars. These taxes could be forgiven without significant loss to th Treasury—balancing on the utilities' books the foregone return on abandoned pl

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97. CPUC, Refs. 43 & 82, passim; En. Cons. Bull. 1(2):7 (August/September 1981).

98. TVA (Knoxville) Division of Energy Conservation & Rates, "Program Summary," Oct 1981, and Deputy Manager of Power's covering letter, 2 February 1982.

99. E. Marshall, Science 211:461-4 (1981); L. Laff, Wall St. J., 20 October 1980; Washington Post editorial, p. A22, 29 October 1980; F.A. McCrackin, personal communication, 1 December 1981 (the program is ahead of schedule and under budget).

100. Ref. 23, p. A-19f.

101. CPUC, Ref. 82, at 187; the specified measures are not the cheapest available.

102. J. Emshwiller, Wall St. J., p. 2:23, 2 September 1980.

103. Ref. 91.

104. Documented in Lovins & Lovins (Ref. 5, 1982), pp. 328-329.

105. After the first thousand installations, via a 10% fee on gross revenues.

106. Ref. 104, Ch. 17.

107. Ref. 94.

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109. Arizona, Florida, Minnesota, Texas.

110. Concept due to W. Appel Esq. (Seattle).

111. Ref. 3; 1980 dollars throughout.

112. Assuming capitalization with $2.1 billion/year (private utilities' current rate of retained earnings) and payback times rising from three years to six.

113. Refs. 3, 5, 6, and 15. Supply could be all renewable by about 2030 (Ref. 6).

114. H. Daly, Steady-State Economics, W.H. Freeman (San Francisco, 1980).

* * *

ATTACHMENT 9

NO. 343,240

CITY OF AUSTIN,	I	IN THE DISTRICT COURT OF
V.	I	
	I	TRAVIS COUNTY, TEXAS
HOUSTON LIGHTING AND POWER COMPANY, AND HOUSTON INDUSTRIES, INC.	I	98 JUDICIAL DISTRICT

PLAINTIFF'S ORIGINAL PETITION

TO THE HONORABLE DISTRICT COURT:

NOW COMES the CITY OF AUSTIN, TEXAS, Plaintiff, complaining of HOUSTON LIGHTING AND POWER COMPANY and HOUSTON INDUSTRIES, INC., Defendants and seeks reformation of the South Texas Project Participation Agreement and other relief as set forth herein.

I.

Plaintiff, the City of Austin, Texas ("Austin"), is a municipal corporation incorporated under the laws of the State of Texas and its Home Rule Charter and located in Travis County. Austin is engaged in the business of producing and distributing electrical power in the Austin area. Austin is the owner of a 16% undivided interest in the South Texas Project ("STP"), a nuclear power plant under construction in Matagorda County, Texas, consisting of two proposed 1250-megawatt units.

Defendant, Houston Lighting and Power Company ("HLP"), is a corporation incorporated and existing under the laws of the State of Texas, having a place of business at 611 Walker Avenue, Houston, Texas where service of process can be made upon its Chairman and Chief Executive Officer, Don D. Jordan. HLP is engaged in the business of producing and distributing electric power within the State of Texas. HLP is the owner of a 30.8% undivided interest in STP.

Defendant, Houston Industries, Inc. ("Houston Industries"), is a corporation incorporated and existing under the laws of the State of Texas, having a place of business at 611 Walker Avenue, Houston, Texas where service can be made upon its Chairman and Chief Executive Officer, Don D. Jordan. Houston Industries owns all the outstanding shares of stock of HLP.

M.S. Hunt

II.

In December, 1973, in the City of Austin, Travis County, Texas, Austin entered into a written agreement ("Participation Agreement") with HLP, Central Power and Light Company ("CPL") and The City of San Antonio, Texas, acting by and through the City Public Service Board ("CPSB"), to participate in the construction, ownership and operation of STP. Each entity has an undivided ownership interest in STP in proportion to its ownership interest. The Participation Agreement is attached as Exhibit A.

Under the Participation Agreement, HLP is designated Project Manager on behalf of the participants. With certain exceptions, HLP, as Project Manager, is to provide for and is responsible for the planning, construction and operation of STP in accordance with the Participation Agreement and project agreements.

III.

As part of HLP's duties as Project Manager, HLP entered into a written contract ("Brown & Root Contract") dated December 31, 1972, with Brown & Root whereby Brown & Root was to act as architect, engineer, constructor and construction manager for STP.

Under the Brown & Root Contract (attached as Exhibit B), Brown & Root was required, among other things, (a) to perform all engineering and design work necessary for STP including all technical services necessary to ensure design and completion of STP in accordance with applicable codes, and state, local and federal government regulations; (b) to formulate, establish and administer a quality assurance and quality control program to meet the requirements of 10 CFR 50, Appendix B; and (c) to perform construction and construction management services as requested by HLP as set forth in Exhibit B and the project documents.

IV.

When Austin entered into the Participation Agreement for STP in December, 1973, Brown & Root had been selected by HLP, as

Project Manager, as the architect, engineer, constructor and construction manager for STP and had commenced work thereon.

In December, 1973, HLP and Brown & Root represented and Austin in good faith believed that Brown & Root possessed or could obtain the requisite nuclear engineering, construction, construction management, quality assurance and quality control expertise, or had the ability to obtain same, sufficient to design, engineer and construct STP in accordance with the Participation Agreement and project agreements, the Brown & Root Contract, the Act, the rules, regulations and requirements thereunder, and to have STP licensed for operation with the Nuclear Regulatory Commission ("NRC"). In December, 1973, HLP represented and Austin in good faith believed that HLP could and would properly perform and discharge its duties as Project Manager. Further, Austin believed that the other participants in good faith believed that Brown & Root possessed or could obtain the expertise described above and that HLP could and would so properly perform as Project Manager.

STP was not designed, engineered or constructed in accordance with the Participation Agreement and project agreements, the Brown & Root contract, the Act, the rules, regulations and requirements thereunder because Brown & Root did not have the above-described expertise and because HLP did not properly perform and discharge its duties as Project Manager.

Austin's belief as to the expertise of Brown & Root and the ability of HLP to properly perform and discharge its duties as Project Manager relate to material facts essential to its entering into the Participation Agreement and remaining as a party to the Participation Agreement, that is, the identity and ability of the party which would design, engineer, construct and provide construction management, quality assurance and quality control services for STP and the ability of HLP to properly perform and discharge its duties as Project Manager.

Brown & Root did not in 1973 or thereafter have the expertise described above and Brown & Root did not have any reasonable prospects of obtaining that expertise. HLP did not in 1973 or thereafter properly perform and discharge its duties as Project Manager.

Accordingly, STP was not designed, engineered or constructed in accordance with the Participation Agreement and project agreements, the Brown & Root contract, the Act, and the rules, regulations and requirements thereunder.

As a result of the mistaken beliefs of the parties relating to the capabilities of Brown & Root and because of HLP's failure to properly perform and discharge its duties as Project Manager, as set forth above, Austin is entitled to reform the Participation Agreement.

V.

From 1973 through approximately 1981, HLP represented to Austin that Brown & Root had or could obtain the expertise described above and that Brown & Root would and could design, engineer and construct STP in accordance with the Participation Agreement and project agreements, the Brown & Root contract, the Act, the rules, regulations and requirements thereunder, and be licensed for operation with the NRC and that HLP could and would properly perform and discharge its duties as Project Manager.

In reliance thereon, the City of Austin entered into and remained in the Participation Agreement, participated and continued to participate in the ownership and funding of STP, and forebore from taking action with respect to STP, HLP or Brown & Root.

The representations made by HLP to Austin relate to material facts essential to Austin's involvement in STP, that is, the identity and ability of the party which would design, engineer, construct and provide construction management and quality assurance and quality control services for STP and the ability of HLP to properly perform and discharge its duties as Project Manager.

The representations made by HLP to Austin were not true in that Brown & Root in 1973 or thereafter did not have the expertise described above and did not have any reasonable prospects of obtaining that expertise and HLP did not properly perform and discharge its duties as Project Manager.

As a result of such action or forebearance by Austin, Austin has suffered the damages set forth below, for which there is no adequate remedy at law.

After 1977 Houston Industries controlled HLP and induced, incited, abetted or participated in the actions described above.

VI.

Austin entered into the Participation Agreement based upon the good faith belief that Brown & Root had or could obtain the expertise described above and that HLP could and would properly perform and discharge its duties as Project Manager.

Brown & Root, in fact, did not have and had no reasonable prospects of obtaining such expertise and HLP did not properly perform and discharge its duties as Project Manager

Austin's beliefs relate to material facts essential to its entering into and remaining in the Participation Agreement, that is, the identity and ability of the party which would design, engineer, construct and provide construction management, quality assurance and quality control services for STP and the ability of HLP to properly perform and discharge its duties as Project Manager.

Austin maintained the preceding good faith beliefs in December, 1973, and thereafter, despite the exercise of ordinary care on its part.

The facts that Brown & Root was to be the architect, engineer, constructor and construction manager on the project and that HLP would properly perform and discharge its duties as Project Manager are of such great consequence to the Participation Agreement that to enforce the Participation Agreement, despite Austin's mistaken beliefs, would be unconscionable so that Austin is entitled to reform the Participation Agreement.

Reformation of the Participation Agreement will not prejudice the rights of HLP.

VII.

Under the Participation Agreement, HLP is to provide for and is responsible for the planning, construction and operation of STP in accordance with the Participation Agreement and the project agreements. These duties relate to a material aspect of the Participation Agreement, that is, the overall coordination and responsibility for the design and building of STP.

Austin's obligation to pay for STP was and is, in part, dependent upon the performance of the above-described duties by HLP.

HLP breached the preceding duties by, among other things:

(a) Selecting Brown & Root to provide the services described above;

(b) Contracting with Brown & Root;

(c) Failing to terminate Brown & Root prior to 1981;

(d) Failing to discern that Brown & Root could not and was not performing as required;

(e) Failing to promptly inform Austin that Brown & Root could not and was not performing as required; and

(f) Failing to properly perform and discharge its duties as Project Manager.

As a result of such acts or omissions by HLP, Austin has suffered the damages set forth below, for which there is no adequate remedy at law.

Houston Industries induced, incited, abetted and participated in the preceding actions of HLP.

VIII.

As a result of HLP's breaches of its contractual obligations, the mistaken beliefs of the parties at the time of entering into the Participation Agreement, Austin's forebearance from taking action with respect to STP, HLP and Brown & Root, and the misplaced reliance on HLP, as set forth above, there has been a material failure of consideration to Austin with respect to the Participation Agreement so that Austin is entitled to reformation of the Participation Agreement as set forth below and have all sums which it has paid pursuant to the Participation Agreement returned to it by HLP.

IX.

As a result of the matters described above, Austin has been damaged in an amount in excess of the jurisdictional amount of this court by virtue of its increased capital and interest expenditures for STP, its loss of use of STP, the necessity to purchase or generate replacement power at higher costs, and its inability to plan and provide for the future power needs of Austin, plus expenditures for attorneys' fees and expenses.

PRAYER

WHEREFORE, Plaintiff respectfully requests this Court to:

(a) Reform the Participation Agreement, such that (1) Austin conveys to HLP its right, title and interest in and to STP; and (2) HLP refunds to Austin the approximately Four Hundred and Thirty-Seven Million Dollars ($437,000,000) expended by Austin to date with respect to STP and all future sums expended by Austin with respect to STP;

(b) Relieve Austin of each obligation, whether past, current or future, to provide money, property or materials with respect to STP;

(c) Enter judgment in favor of Austin and against HLP and Houston Industries, jointly and severally, in the amount of damages to which Austin is entitled, together with interest, costs and attorneys' fees.

(d) Award such other relief, general and special, legal and equitable, as the Court deems appropriate under the circumstance.

THE STATE OF TEXAS I
I
COUNTY OF TRAVIS I

Albert DeLaRosa, being first duly sworn, deposes and says that he is the City Attorney for the City of Austin, Texas, a municipal corporation, incorporated under the laws of the State of Texas and its Home Rule Charter and located in Travis County, Texas and that the allegations contained in Paragraph VIII of Plaintiff's Original Petition are true and correct.

Albert DeLaRosa
Albert DeLaRosa
City Attorney
City of Austin, Texas

SUBSCRIBED AND SWORN TO before me on this the 6th day of January, 1983.

Rita Smith
Notary Public in and for
Travis County, Texas

My Commission Expires:
September 1, 1985

OFFICE OF THE CITY ATTORNEY,
CITY OF AUSTIN, TEXAS

Albert DeLaRosa
Albert DeLaRosa
City Attorney

Texas Bar No. 05648500
Business Address:
Suite 304, Brown Building
708 Colorado Street
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FULBRIGHT & JAWORSKI
Blake Tartt
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(713) 651-5131

VARNUM, RIDDERING, WIERENGO & CHRISTENSON
Thomas J. Heiden
800 Mutual Home Building
Grand Rapids, Michigan 49503
(616) 459-4186

ATTORNEYS FOR PLAINTIFF,
THE CITY OF AUSTIN, TEXAS

ATTACHMENT 10

NUCLEAR POWER PLANTS CANCELLED IN 1982

Plant	Utility	$ Lost (millions)
Allens Creek	Houston Lighting and Power Co.	$ 388
Black Fox 1 & 2	Public Serv. Co., Okla.	$ 233
Cherokee 2 & 3	Duke Power, South Carolina	$ ----
Hartsville B 1 & B2 and Phipps Bend 1 & 2	Tenn. Valley Authority	$2,000
North Anna 3	Virginia Elec. Power Co.	$ 540
Pebble Springs 1&2	Portland Gen. Elec., Ore.	$ 180
Perkins 1,2, & 3	Duke Power, North Carolina	$ ----
Vandalia	Iowa Power & Light	$ ----
WPPSS 4 & 5	Wash. Public Power Supply System	$ 2,250

Cancellations in 1982 represented a lost investment of at least $5.4 billion.

ATTACHMENT 11

At $5.4 billion, utilities say it's cheaper to scrub projects

Chicago Tribune

The nation's electric utilities have canceled plans for 16 nuclear reactors this year, leaving ratepayers to pick up the $5.4 billion already spent on design and construction of the projects.

Last week, Virginia Electric Power Co. joined the list by canceling its North Anna No. 3 reactor after spending $540 million and completing about 10 percent of the project. With a total cost estimated at $5 billion, the project was "just too expensive to build," the utility said.

In Illinois, critics of Commonwealth Edison Co.'s proposed 18.4 percent rate increase again last week asked that the Illinois Commerce Commission delay or cancel the utility's two Braidwood nuclear units, on which the company has spent $1.6 billion.

But Edison presented the commission the results of 34 studies showing that over 40 years, canceling the half-completed project would cost consumers $731 million to $2.6 billion more than to complete it.

So far this year, a record 22,019 megawatts of planned nuclear generating capacity has been canceled around the country, four times what was canceled last year and nearly enough to supply two metropolitan areas the size of Chicago. The cancellations were by six investor-owned utilities, the Tennessee Valley Authority and the Washington Public Power Supply System.

And, as the growth in electricity use falls short of projections, while the cost of nuclear reactors rapidly escalates, many utilities are facing the difficult decision of whether to cancel a project after substantial amounts of money have been spent.

Utilities are asking regulators for permission to raise rates to recover the millions of dollars sunk into canceled plants. "In many cases it is becoming cheaper to pay off the plant than it is if the utility continues to build it," one industry observer said.

Regulators in at least 25 states have been willing to pass on to consumers much or all of the "prudently incurred costs" of abandoned projects, although they frequently are stretching repayment over a longer period than the utilities seek and often do not permit them to earn a return on the unamortized amounts.

"In most cases, the (regulatory) commissions have determined that when the decision to commence construction of a plant was reasonable . . . and where cancellation of construction was either reasonable or required by a state regulatory agency, the utility and hence the investors are entitled to recover at least a portion of the costs of the canceled project," Commonwealth Edison said in a memorandum to the ICC.

Virginia Electric is asking regulators in that state for permission to raise rates to recover over 10 years the money spent on North Anna No. 3, arguing that it is cheaper in the long run to abandon the project than to complete it.

"If we completed the unit, the price of electricity to our customers by the mid-1990s would be at least 10 percent higher than it is if we pursue alternatives," said Paul Edwards, vice president of public affairs. These alternatives, he said, include buying a share of generating plants planned by neighboring utilities or building a coal-fired unit to meet projected demand after 1990.

Virginia Electric completed its North Anna unit No. 2 two years ago at a cost of $550 million, but the cost of unit No. 3 spiraled as a result of high interest rates, delays and inflationed component and labor costs. Design and regulatory changes required since the accident at Three Mile Island alone were estimated to add $260 million to the cost.

"Nuclear has priced itself out of the market," Edwards said.

In Indiana, the Public Service Commission has approved a plan for Northern Indiana Public Service Co. to recover its $190.7 million investment in the canceled Bailly nuclear power plant through rates over the next 15 years. And, New Jersey regulators are permitting Public Service Electric and Gas Co. of Newark to raise an extra $370 million in rates over 15 years to cover its investment in the Hope Creek II reactor, canceled last December.

In rare instances, regulators have been prepared to permit higher rates to cover the "money costs" for the yet-unrecovered amounts. The effect is to create an interest-free loan from a utility's stockholders to its customers, which some argue reflects a degree of cost sharing.

Only two companies have been denied any cost recovery because of imprudence, but an Ohio Supreme Court decision in July 1981 has complicated efforts by utilities in that state to recover their stake in canceled projects. The court ruled that the state utility commission exceeded its authority when it permitted Cleveland Electric Illuminating Co. to recoup $52 million invested in four planned nuclear reactors.

> *Utilities are facing the difficult decision of whether to cancel a project after substantial amounts of money have been spent.*

The U.S. Supreme Court rejected an appeal of the ruling, but the company has filed another appeal with the court, arguing that the state ruling amounts to unconstitutional seizure of property.

Meanwhile, the Ohio utility commission granted a rate increase that raised the target return on equity by a full percentage point, to 17 percent. The Ohio Consumers Council is challenging that action in court, charging the commission permitted the increase so the utility could recoup the money it otherwise would lose as a result of the cancellation.

In Illinois, Commonwealth Edison officials acknowledge that their continuing need for higher rates is fueled in large measure by the financing requirements of its six-unit nuclear construction program. The company's LaSalle Unit No. 1, its first reactor to come on line since 1974, began operation last month and other reactors are to be completed over the next four years.

Responding to criticism that the plants are too costly and are unnecessary, Edison last week said that a one-year delay in the schedule for its Byron units alone would cost ratepayers at least $133 million, while a one-year delay for both the Byron and Braidwood units would cost at least $345 million.

Edison said its studies show only one scenario — the unlikely case where inflation is rising 30 percent faster than coal costs — in which ratepayers come out ahead by the cancellation of the two Braidwood units, which are to begin operation in 1986 and 1987. Even in that instance, the company said, the savings are insignificant compared to the likely higher costs of other scenarios.

ATTACHMENT 12

SAN ANTONIO EXPRESS — Monday, January 24, 1983

New foil insulates windows

HOUSTON (AP) — A California company has introduced a "transparent – aluminum foil" for windows that shuts out the cold and keeps in the heat.

Energy experts estimate that one-twentieth of all the energy used in the country literally goes out of the window.

But officials of The Southwall Corp. say that, using their ultra-thin film, called Heat Mirror, between two panes can reduce heat loss four times better than conventional windows.

The film is being displayed at the 48th annual convention of the National Association of Home Builders here this week.

"Using Heat Mirror, you could be next to a window in a restaurant, hospital or your home during the winter and not feel uncomfortable," said Steven M. Brown, marketing director for the Palo Alto, Calif., company.

Heat Mirror was the brainchild of Massachusetts Institute of Technology scientists, who began their search in the early 1970s for a more energy efficient window, Brown said.

The basic technology had been around for years, he said. Similar coatings have been used to prevent icing and fogging on airplane windshields. The problem was to find a way to make the technology affordable for windows in homes and buildings, he said.

In 1978, Southwall took over where MIT left off, using money from several "good venturing capitalists," Brown said.

More than 80,000 square feet of Heat Mirror has been used in hospitals, restaurants, banks and family homes during the past 22 months, he said.

Recently all 581 windows at City Hall in Spokane, Wash., were replaced with those insulated with Heat Mirror, he said. Architects estimated that more than $1.3 million would be saved in heating bills while the building is being used, Brown said.

"No matter now well a house or building is insulated, windows that allow sunshine in also let heat out," he said. "Heat Mirror not only shuts in the heat but allows light from the sun in. The same is true in the summer. It keeps the inside cool and the heat out."

Although the new windows cost more — between $15 to $25 — Brown said the cost is recovered in the energy bill savings.

The Light company Houston Lighting & Power P.O. Box 1700 Houston, Texas 77001 (713) 228-9211

March 18, 1983

ST-HS-YQ-00260
File No.: Q12.8
Q16.4

Mr. L. W. Hurst
Project QA Manager
Bechtel Energy Corporation
P.O. Box 15
Bay City, Texas 77414

SUBJECT: SOUTH TEXAS PROJECT ELECTRIC GENERATING STATION
PROJECT AUDIT REPORT NUMBER G01-301

Dear Mr. Hurst:

Attached is the Project Audit Report of Bechtel's Quality Assurance/Quality Control activities, Audit Number G01-301, performed on February 8 through 16, 1983. The results are summarized as follows:

·Number of Items Reviewed:	1110
·Number of Deficiencies:	33
·Number of Concerns:	7
·Number of CARs:	4
·Number of DNs:	10

A written response to all concerns is required to be submitted by April 18, 1983.

If you have any comments or require additional information, please contact Ms. D. I. Teague at 512/97?-5466 extension 2420.

Very truly yours,

H. A. Walker

H. A. Walker
Project QA Manager
South Texas Project

gwt
HAW/JWE/BSN:lr
Attachment

cc: G. W. Oprea, Jr.
J. E. Geiger
D. G. Barker
R. J. Maroni
S. M. Dew
J. W. Williams
R. L. Ulrey
E. A. Turner
A. R. Beavers
J. G. Dewease
J. H. Goldberg
L. B. Horrigan
R. P. Murphy
D. I. Teague
D. T. Krisha (BPC)
B. L. Lex (BEC)
R. W. Miller (BEC)
K. R. Dotterer (BEC)
B. R. McCullough (BEC)
R. L. Patterson (BEC)
Audit File GC1-301
STP/RMS-CCS
Site Library

SOUTH TEXAS PROJECT AUDIT REPORT

AUDIT NO.: G01-301

AUDIT DATES: February 8-16, 1983

AUDITED ORGANIZATION:

Bechtel Energy Corporation
QA/QC (Houston and Site)
P.O. Box 15
Bay City, Texas 77414

AUDIT TEAM:

D. I. Teague	Team Leader
D. W. Bohner	Auditor
A. C. Von Nyvenheim	Auditor
R. M. McDaniel	Auditor

Doris Teague 3/8/83
Lead Auditor Date

PERSONNEL CONTACTED:

		PRE-AUDIT	DURING AUDIT	POST-AUDIT
R. W. Miller	BEC PQAE		X	X
E. B. Luder	BEC LQAE	X	X	
R. A. Meggison	BEC PQCE	X	X	X
K. R. Dotterer	BEC PQAE		X	
R. H. Medina	BEC LQAE		X	X
R. Ramsey	BEC QAE		X	
S. M. Dugas	BEC QAE		X	
Y. Sadre-Orafai	BEC QAE		X	
J. P. Cook	BEC QAE		X	
R. Kay	BEC QCE		X	
D. Bentley	BEC QCE		X	
W. F. Houston	BEC QAE		X	
R. M. Cantrell	BEC QAE		X	
G. Brumbaugh	BEC QCE		X	
D. Allen	BEC Administrative Assistant		X	
D. Lucy	BEC QAE		X	
D. Lattimore	BEC QAE		X	
K. P. McNeal	BEC QAE		X	
J. R. Pidgeon	BEC QAE		X	

OBJECTIVE OF THE AUDIT:

To verify the adequacy of the Bechtel STP QA program and proper implementation of the quality-related procedures.

DEFICIENCIES/CONCERNS

DEFICIENCIES:

1. A Corrective Action Request (CAR) was not initiated for quality related deficiencies identified during surveillance as was required by the referenced Quality Program Manual.

   HL&P CAR No. G-220 issued.

2. Contractor/Constructor safety-related procedure for hydro test was not reviewed in accordance with the referenced requirements, in that it did not contain requirements for qualified personnel to perform hydro tests.

   HL&P CAR No. G-221 issued.

3. There was no objective evidence that STP Site Qualified Auditors participated as an auditor in training prior to their certification as auditor.

   HL&P CAR No. G-222 issued.

4. Bechtel's quality related implementing procedures do not adequately incorporate programmatic requirements.

   HL&P CAR No. G-223 issued.

5. BEC audit notification memorandum's did not list schedule dates, or address the entrance or exit meeting, as required.

   HL&P DN No. 010 issued.

6. The PQAE is not maintaining a daily log in which to document results of required reviews.

   HL&P DN No. 011 issued.

7. Procedures did not have a reference section and did not make reference to applicable documents.

   HL&P DN No. 012 issued.

8. NCR reports did not have required QCE stamps applied.

   HL&P DN No. 013 issued.

9. Formal replies to BEC's Redundant Inspection deficiencies issued to contractor/constructor are not being received within five (5) working days.

   HL&P DN No. 014 issued.

DEFICIENCIES: (Cont.)

10. Selected quality surveillance plans did not receive the required in-depth review by QA.

    HL&P DN No. 023 issued and closed.

11. A BEC Project Quality Assurance Procedure was in conflict with the PQPM as to when the BEC Division Manager, Quality Assurance approves revisions to the PQPM (prior or subsequent to HL&P approval).

    HL&P DN No. 024 issued.

12. Written notification of completion of prescribed training, for QAEs was not provided to the QA Manager/Audits as required.

    HL&P DN No. 025 issued.

13. There is no objective evidence that Quality Surveillance Discrepancy Reports were being trended, as required.

    HL&P DN No. 026 issued.

14. Certain sections of the BEC PQPM did not receive review/comment by Construction as required.

    HL&P DN No. 027 issued.

15. Open items on the QAE log were not carried forward; required evaluation of CAR responses were not performed on 3 CARs; the CAR log did not contain justification for granting a verbal request for extension; PQAE entries in the QAE QA logs were not dated; and forms titled "San Onofre Nuclear Generating Station" were being utilized for the Quality Audit log.

    These deficiencies were corrected during the performance of the audit and no further action is required.

    Two additional deficiencies were identified that had to do with trending of Redundant Inspection Reports and transmittal of the reports to the contractor for corrective action. These deficiencies had been previously identified on and are being resolved by HL&P CAR G-195.

CONCERNS:

1. Quality tracking document cards were not being maintained up-to-date as required by BEC PQAP 7.14, paragraphs 5.2.3.B, 5.3.4.A and 5 4.5.A.

   PQAP 7.14 appears to be administrative in nature since safety related activities relating to specific review/sign-offs are contained in other Volume V procedures. Bechtel has committed to delete PQAP 7.14 from Appendix B of the PQPM at the next regular revision.

2. Paragraph 3.2 of BEC PQAP 3.8, Rev. 6, provides eight examples of activities to be included in the Quality Assurance log. The only activities presently being included in the log are audits and surveillances. This concern will be resolved as part of the on-going activities related to CAR G-140 and correspondence number ST-HS-YQ-00230 and ST-YB-HL-3100.

3. PQAP 3.1 lists several items to be included in the Monthly Quality Assurance Activity Reports. These items include results of client, supplier or project meetings, quality trends and unacceptable corrective actions which are not being included in the Monthly QA Activity Report.

   This concern will be resolved as part of the on-going activities related to CAR G-140 and correspondence number ST-HS-YQ-00230 and ST-YB-HL-3100.

4. A disparity exists within BEC QCI 2.4, Rev. 2 (PCN 3) in that paragraph 5.2.2 requires approved procedures to be used as a source of attributes for inspection planning, whereas, the following sentence addresses "deviations from procedures, code requirements, and standards and specifications." Step number 3 of Appendix I requires the QC inspector to enter the controlling specification/procedure number. These disparities could cause confusion on the part of personnel implementing QCI 2.4 as to which document is applicable as a source of attributes for inspection planning.

5. WPP/QCI 2.4, Rev. 2, paragraph 5.2, requires "a statement justifying the changes" to be included in the Document Review Comment Sheet (DRCS). The DRCS was not being used unless the reviewer originated it, however, the information required on the DRCS was being anotated on the marked up copy of the reviewed document. It is understood that Bechtel is initiating a PCN to require the statement of justification to be entered on the marked up copy of the reviewed document.

6. QCI 8.0, Rev. 2, Section 9.5, requires the training record (Form QCI-8.0-07) to show the type of format, number of courses attended, instructor, subject, method of administration and date. Form QCI-8.0-07 does not contain a space/block for type of format, however, since "method of administration" is considered to be the type of format, the requirement to show the type of format may need to be deleted.

CONCERNS: (CONTINUED)

7. Certification records for QCE personnel had been anotated with the statement "Certified in accordance with paragraph 6.1.1 of QCI-8.0." This would indicate that the QCEs did not have the total experience as specified in ASNI N45.2.6, however, further review of the certification records indicated that this statement should not have been used. Apparent confusion exists as to when this statement applies.

AUDIT SUMMARY/RECOMMENDATIONS

With the exception of the deficiences and concerns identified within the report, the consensus of the audit team was that the BEC QA program and procedural implementation was adequate. It is recommended, however, that Bechtel place more emphasis on obtaining adequate procedural reviews and more attention to detail is needed in day-to-day procedural implementation.

ATTACHMENTS:

HL&P CARs G-220 through G-223
HL&P DNs 010 through 014 and 023 through 027

PQA-042 (9/82)

The Light company

SOUTH TEXAS PROJECT ELECTRIC GENERATING STATION
HOUSTON LIGHTING & POWER

G01-301

QUALITY ASSURANCE
CORRECTIVE ACTION REPORT

(1) CAR No. G-220

(2) REVISION 0

1

(3) ORGANIZATION	(4) DEF REQUIRED	(5) RESPONSE DUE DATE
Bechtel QA Department	☐ YES ☒ NO	03-26-83
(6) DOCUMENT VIOLATED BEC QPQM, Section 18	REV. 1	PARA. 3.1

(7) DESCRIPTION OF CONDITION ADVERSE TO QUALITY

A corrective Action Request (CAR) was not initiated for quality related deficiencies identified during surveillance as was required by the referenced Quality Program Manual. See continuation sheet to this CAR for details.

(8) REPORTED BY: Doris Teague — DATE: 2/23/83

(9) REVIEW AND APPROVAL: [signature] for C.D. Wright — DATE: 2/24/83

2

(10) REMEDIAL ACTION

(11) SIGNATURE — DATE: — (12) EFFECTIVE DATE:

3

(13) CAUSE OF CONDITION

(14) CORRECTIVE ACTION TO PREVENT RECURRENCE

(15) REVIEW AND APPROVAL — DATE: — (16) EFFECTIVE DATE:

4

(17) HL&P INITIATOR — ☐ ACCEPT ☐ REJECT — SUPERVISOR — DATE

(18) VERIFICATION PERFORMED BY: — ☐ SAT ☐ UNSAT — SUPERVISOR — DATE

(19) HL&P QA CLOSURE: — DATE

HL&P QA CORRECTIVE ACTION REPORT CONTINUATION

(1) CAR NO. 220

(2) REVISION 0

BLOCK (7) DESCRIPTION OF CONDITION ADVERSE TO QUALITY

BEC PQPM, section 18, paragraph 3.1 states in part, "Quality related deficiencies found during surveillance, witness or audit are reported as audit findings by issuing Corrective Action Requests (CAR)."

NOTE: BEC PQAP-7.11, paragraph 4.3.1.C.5.Note, states in part, "Every effort shall be made to have deficiencies corrected without initiating a Corrective Action Request (CAR). For important items that cannot be corrected, during tne surveillance, the QAE shall advise the PQAE of the situation. The PQAE shall evaluate the circumstances and if appropriate, issue a CAR."

Contrary to the above requirements, surveillance number B13.2 (surveillance of ESI maintenance activities) performed 11/15/82-11/19/82, indicated a lack of objective evidence that monthly inspections and weekly maintenance activities were being performed on certain cranes utilized in handling safety related equipment. This deficiency was not corrected during the surveillance and no CAR was issued as required by the PQPM.

PQA-042 (9/82)

The Light company

SOUTH TEXAS PROJECT ELECTRIC GENERATING STATION
HOUSTON LIGHTING & POWER

G01-301

QUALITY ASSURANCE
CORRECTIVE ACTION REPORT

(1) CAR No. G-221

(2) REVISION 0

1

(3) ORGANIZATION Bechtel QA Department

(4) DEF REQUIRED ☐ YES ☒ NO

(5) RESPONSE DUE DATE 03-26-83

(6) DOCUMENT VIOLATED BEC PQAP-7.13

REV. 0

PARA. 3.1.1

(7) DESCRIPTION OF CONDITION ADVERSE TO QUALITY

Contractor/Constructor safety related procedure was not reviewed in accordance with the referenced requirements. See continuation sheet for details.

(8) REPORTED BY: Doris Teague DATE: 2/23/83

(9) REVISION AND APPROVAL [illegible] for C. Wright DATE: 2/24/83

2

(10) REMEDIAL ACTION

(11) SIGNATURE DATE: (12) EFFECTIVE DATE:

3

(13) CAUSE OF CONDITION

(14) CORRECTIVE ACTION TO PREVENT RECURRENCE

(15) REVIEW AND APPROVAL DATE: (16) EFFECTIVE DATE:

4

(17) HL&P INITIATOR ☐ ACCEPT ☐ REJECT SUPERVISOR DATE

(18) VERIFICATION PERFORMED BY ☐ SAT ☐ UNSAT SUPERVISOR DATE

(19) HL&P QA CLOSURE DATE

IMAGE EVALUATION TEST TARGET (MT-3)

150mm

6"

IMAGE EVALUATION
TEST TARGET (MT-3)

150mm

6″

HL&P QA CORRECTIVE ACTION REPORT CONTINUATION

(1) CAR NO. G-221

(2) REVISION 0

BLOCK (7) DESCRIPTION OF CONDITION ADVERSE TO QUALITY

STP-PQAP, section 11, paragraph 11.3 states in part, "Tests are performed and evaluated by qualified personnel."

BEC PQAP-7.13, paragraph 3.1.1 states in part, "The Site PQAE . . .shall review. . .contractor safety related procedures prior to issuance for. . .special process control requirements such as personnel, procedure or equipment qualification."

Contrary to the above requirements, Ebasco procedure CSP-17, does not provide for qualified personnel to perform hydro tests.

PQA-042 (9/82)

The Light company

SOUTH TEXAS PROJECT ELECTRIC GENERATING STATION
HOUSTON LIGHTING & POWER

G01-301

QUALITY ASSURANCE
CORRECTIVE ACTION REPORT

(1) CAR No. G-222

(2) REVISION 0

1

(3) ORGANIZATION	(4) DEF REQUIRED	(5) RESPONSE DUE DATE
BEC Quality Assurance	☐ YES ☒ NO	03-26-83

(6) DOCUMENT VIOLATED	REV.	PARA.
~~LAQAD 8.1~~ BEC PQAP-8.1 of 2-24-83	9	5.1.(B)

(7) DESCRIPTION OF CONDITION ADVERSE TO QUALITY

The above reference document requires individuals qualified as auditors to participation in one audit as an auditor in training under the cognizance of a lead auditor. Contrary to the above, there is no objective evidence that STP Site Qualified Auditors participated as an auditor in training prior to their certification as auditor.

Examples are: (see attached sheet)

(8) REPORTED BY: Doris Teague DATE: 2/24/83

(9) REVIEW AND APPROVAL: H Hubbard for C Wright DATE: 2/24/83

2

(10) REMEDIAL ACTION

(11) SIGNATURE | DATE: | (12) EFFECTIVE DATE:

3

(13) CAUSE OF CONDITION

(14) CORRECTIVE ACTION TO PREVENT RECURRENCE

(15) REVIEW AND APPROVAL | DATE | (16) EFFECTIVE DATE:

4

(17) HL&P INITIATOR	☐ ACCEPT ☐ REJECT	SUPERVISOR	DATE
(18) VERIFICATION PERFORMED BY:	☐ SAT ☐ UNSAT	SUPERVISOR	DATE
(19) HL&P QA CLOSURE:			DATE

HL&P QA CORRECTIVE ACTION REPORT CONTINUATION

(1) CAR NO. G-222

(2) REVISION 0

NAME	AUDITOR CERTIFICATION DATE	AUDIT NO. DATE
S. Mittal	10/18/82	15-82/A13.1
D. Lattimore	11/9/82	5-82-B2.1 (5/82)
D. Lucy	7/21/82	5-82-A15.1 (5/82)
G. Morgan	11/1/82	14-82-A12.1 (8/82)

NOTE: The audit reports issued for the above audits list the individuals as auditors.

PQA-042 (9/82)

The Light company

SOUTH TEXAS PROJECT ELECTRIC GENERATING STATION
HOUSTON LIGHTING & POWER

QUALITY ASSURANCE
CORRECTIVE ACTION REPORT

G01-301

(1) CAR No. G-223

(2) REVISION 0

1

(3) ORGANIZATION Bechtel QA Department

(4) DEF REQUIRED ☐ YES ☒ NO

(5) RESPONSE DUE DATE 03-26-83

(6) DOCUMENT VIOLATED See Continuation Sheet | REV. | PARA. See Continuation Sheet

(7) DESCRIPTION OF CONDITION ADVERSE TO QUALITY

Bechtel's quality related implementing procedures do not adequately incorporate programmatic requirements. See continuation sheet for specific examples.

(8) REPORTED BY: Doris Teague | DATE: 2/23/83

(9) REVIEW AND APPROVAL [illegible] for [illegible] Wright | DATE: 2/24/83

2

(10) REMEDIAL ACTION

(11) SIGNATURE | DATE: | (12) EFFECTIVE DATE:

3

(13) CAUSE OF CONDITION

(14) CORRECTIVE ACTION TO PREVENT RECURRENCE

(15) REVIEW AND APPROVAL | DATE: | (16) EFFECTIVE DATE

4

(17) HL&P INITIATOR | ☐ ACCEPT ☐ REJECT | SUPERVISOR | DATE

(18) VERIFICATION PERFORMED BY | ☐ SAT ☐ UNSAT | SUPERVISOR | DATE

(19) HL&P QA CLOSURE | DATE

HL&P QA CORRECTIVE ACTION REPORT CONTINUATION

(1) CAR NO. G-223

(2) REVISION 0

BLOCK (6) DOCUMENT VIOLATED

1) ANSI N45.2, section 3 (Organization), states in part, "Persons and organizations performing quality assurance functions shall have sufficient authority and organizational freedom to. . .control further processing, delivery, or installation of a nonconforming item, deficiency, or unsatisfactory condition until proper dispositioning has occurred."

2) ANSI N45.2, section 1.4 defines Quality Control as "Those quality assurance actions which provide a means to control and measure the characteristics of an item, process, or facility to established requirements."

3) BEC PQAM, section 7, paragraph 7.5.1 states in part, "Using the receiving inspection quality control instructions, the PQCE and staff perform receiving inspection activities that include, as a minimum. . .replacement of protective measures removed during receipt inspection."

4) BEC PQPM, section 10, paragraph 1.7 states, "The personnel qualification procedures include provisions to maintain and periodically review records of inspector's qualifications to ensure that they are kept current."

HL&P QA CORRECTIVE ACTION REPORT CONTINUATION

(1) CAR NO. C-223

(2) REVISION 0

BLOCK (6) DOCUMENT VIOLATED

5) BEC PQPM, section 12, paragraph 1.1 states, "Inspection procedures require that the inspector check calibration labels or tags as well as apparent proper functioning of the instrument prior to use to assure that the calibration period has not lapsed and the equipment is in proper working order."

6) BEC PQPM, section 16, paragraph 2.1 states in part that the "Project QA Manager or his designee is responsible for monitoring the results of the projects corrective action program" and that "He reviews and analyzes Engineering design deficiency reports and trend reports, for indications of conditions which may require corrective action."

HL&P QA CORRECTIVE ACTION REPORT CONTINUATION

(1) CAR NO. G-223

(2) REVISION 0

BLOCK (7) DESCRIPTION OF CONDITION ADVERSE TO QUALITY

1) Contrary to the requirements stated in items 1 and 2 of Block 6, neither BEC's QA program or WPP/QCI-34.0 (Organization and Responsibilities) provide authority and organizational freedom for the Project Quality Control Engineer to control further processing, etc. (Stop Work Authority).

2) Contrary to the requirement stated in item 3 to Block 6, the BEC receiving inspection quality control instruction WPP/QCI-4.0, Rev. 1 does not require the PQCE and staff to verify "replacement of protective measures removed during receipt inspection."

3) Contrary to the requirement stated in item 4 of Block 6, WPP/QCI-8.0, Rev. 2 does not include provisions for a periodic review of inspectors qualifications to ensure that they are kept current.

4) Contrary to the requirement stated in item 5 of Block 6, QCI-2.4 and WPP/QCI-2.2 do not require QC inspectors to check calibration labels or tags, or apparent proper functioning of calibration instruments.

HL&P QA CORRECTIVE ACTION REPORT CONTINUATION

(1) CAR NO. G-223

(2) REVISION 0

BLOCK (7) DESCRIPTION OF CONDITION ADVERSE TO QUALITY

5) Contrary to the requirement stated in item 6 of Block 6, PQAP-7.10 does not require Engineering design deficiency reports or trend reports to be reviewed/analyzed for indications of conditions which may require corrective action.

HOUSTON LIGHTING & POWER
SOUTH TEXAS PROJECT ELECTRIC GENERATING STATION

QUALITY ASSURANCE
DEFICIENCY NOTICE

1 DN NO. 010
2 REV. 0

3 ORGANIZATION	4 DATE ISSUED	5 DATE DUE
Bechtel QA Department	2/24/83	3/17/83
6 DOCUMENT VIOLATED	7 REVISION	8 PARA.
BEC PQAP-5.1	0	4.1.1.D

1 9 DESCRIPTION OF DEFICIENCY

See Continuation Sheet

10 INITIATOR	DATE
Doris Teague	2/23/83
11 REVIEW & APPROVAL	DATE
M Hubbard For E O Wright	2/24/83
12 PERSON CONTACTED R. W. Mill / POSITION SITE PQAE	DATE 2/24/83

2 13 REMEDIAL ACTION

14 SIGNATURE	DATE	15 EFFECTIVITY DATE

3

16 RESPONSE ACCEPTANCE–INITIATOR	DATE	17 SUPERVISOR APPROVAL	DATE

18 VERIFICATION PERFORMED BY DATE ☐ SATISFACTORY ☐ UNSATISFACTORY CAR NO.

19 QA CLOSURE – INITIATOR	DATE	REVIEW & APPROVAL	DATE

20 CC LIST

H. A. WALKER
L. W. HURST
J. E. ESTELLA

HL&P QA DEFICIENCY NOTICE CONTINUATION

(1) DN NO. 010

(2) REVISION 0

BLOCK (9) DESCRIPTION OF DEFICIENCY

BEC PQAP-5.1, Rev. 0, paragraph 4.1.1.D states in part. . ."The notification memorandum for scheduled audits shall contain. . .entrance and exit meeting, and schedule dates. . .".

Contrary to the above, BEC notification memorandum's do not list schedule dates, (only date referenced is start of the audit), or address the entrance or exit meeting.

HOUSTON LIGHTING & POWER
SOUTH TEXAS PROJECT ELECTRIC GENERATING STATION

QUALITY ASSURANCE
DEFICIENCY NOTICE

1 DN NO. 011
2 REV. 0

3 ORGANIZATION	4 DATE ISSUED	5 DATE DUE
Bechtel QA Department	2/24/83	3/17/83

6 DOCUMENT VIOLATED	7 REVISION	8 PARA.
BEC PQAP-3.5	Interim	5.2.F

1 9 DESCRIPTION OF DEFICIENCY

See Continuation Sheet

10 INITIATOR Doris Teague	DATE 2/23/83
11 REVIEW & APPROVAL [Hubbard] For C.O. Wright	DATE 2/24/83
12 PERSON CONTACTED R.W. Mill[illegible] POSITION SITE PQAE	DATE 2/24/83

2 13 REMEDIAL ACTION

14 SIGNATURE	DATE	15 EFFECTIVITY DATE

3

16 RESPONSE ACCEPTANCE – INITIATOR	DATE	17 SUPERVISOR APPROVAL	DATE
18 VERIFICATION PERFORMED BY DATE	☐ SATISFACTORY ☐ UNSATISFACTORY		CAR NO.
19 QA CLOSURE – INITIATOR	DATE	REVIEW & APPROVAL	DATE

20 CC LIST

H. A. WALKER
L.W. HURST
J.E. ESTELLA

HL&P QA DEFICIENCY NOTICE CONTINUATION

(1) DN NO. 011

(2) REVISION 0

BEC PQAP-3.5, section 5.2.F states in part, "The PQAE shall: . . . review previously established trends on a quarterly basis to assure effectivity of corrective action and recurrence control. Results of this review shall be documented in the PQAE daily log with appropriate actions. . ."

Contrary to the above requirement, the PQAE is not maintaining a daily log in which to document results of the required review.

HOUSTON LIGHTING & POWER
SOUTH TEXAS PROJECT ELECTRIC GENERATING STATION

QUALITY ASSURANCE
DEFICIENCY NOTICE

1 DN NO. 012
2 REV. 0

3 ORGANIZATION	4 DATE ISSUED	5 DATE DUE
Bechtel QA Department	2/24/83	3/17/83
6 DOCUMENT VIOLATED	7 REVISION	8 PARA.
BEC PQAP-7.13	0	3.1.1

1

9 DESCRIPTION OF DEFICIENCY

See Continuation Sheet

10 INITIATOR	DATE
Doris Teague	2/23/83
11 REVIEW & APPROVAL	DATE
S H Hubbard for C O Wright	2/24/83
12 PERSON CONTACTED R.W Miller — POSITION SITE PQAE	DATE 2/24/83

2

13 REMEDIAL ACTION

14 SIGNATURE	DATE	15 EFFECTIVITY DATE

3

16 RESPONSE ACCEPTANCE–INITIATOR	DATE	17 SUPERVISOR APPROVAL	DATE

18 VERIFICATION PERFORMED BY DATE ☐SATISFACTORY ☐UNSATISFACTORY CAR NO.

19 QA CLOSURE – INITIATOR DATE REVIEW & APPROVAL DATE

20 CC LIST

H.A. WALKER
L.W. HURST
J.E. ESTELLA

PQA-059 (10.82)

HL&P QA DEFICIENCY NOTICE CONTINUATION

(1) DN NO. 012

(2) REVISION 0

BEC PQAP-7.13, Rev. 0, paragraph 3.1.1 states in part, "The Site PQAE, or designee, shall review BEC WPP and QCI and contractor QA/QC and contractor safety-related work procedures prior to issuance for reference to applicable documents. . ."

BEC WPP/QCI-2.1, Rev. 3, paragraph 4.8 through 4.8.3 states, "The standard format (for procedures) shall include purpose, abbreviations and references."

Contrary to the above requirements, the following procedures do not have a reference section and do not make reference to applicable documents:

WPP/QCI-2.3, Rev. 2 PCN proc.

QCI-2.4, Rev. 2

WPP/QCI-24.0, Rev. 0

QCI-28.1, Rev. 1 ✓

WPP-12.1, Rev. 0

HOUSTON LIGHTING & POWER
SOUTH TEXAS PROJECT ELECTRIC GENERATING STATION

QUALITY ASSURANCE
DEFICIENCY NOTICE

1 DN NO. 013
2 REV. 0

3 ORGANIZATION	4 DATE ISSUED	5 DATE DUE
Bechtel QC Department	2/24/83	3/17/83
6 DOCUMENT VIOLATED	7 REVISION	8 PARA.
BEC QCI-2.6	1	5.5

1

9 DESCRIPTION OF DEFICIENCY

See Continuation Sheet

10 INITIATOR	DATE
Doris Teague	2/23/83
11 REVIEW & APPROVAL	DATE
W Hubbard For C D Wright	2/24/83
12 PERSON CONTACTED / POSITION	DATE
[illegible] / PRCE	2-24-83

2

13 REMEDIAL ACTION

14 SIGNATURE	DATE	15 EFFECTIVITY DATE

3

16 RESPONSE ACCEPTANCE–INITIATOR	DATE	17 SUPERVISOR APPROVAL	DATE

18 VERIFICATION PERFORMED BY DATE ☐ SATISFACTORY ☐ UNSATISFACTORY CAR NO.

19 QA CLOSURE – INITIATOR DATE REVIEW & APPROVAL DATE

20 CC LIST

H.A. WALKER
L.W. HURST
J.E. ESTELLA

PQA-059 (10/82)

HL&P QA DEFICIENCY NOTICE CONTINUATION

(1) DN NO. 013

(2) REVISION 0

BLOCK (9) DESCRIPTION OF DEFICIENCY

Paragraph 5.5 of the referenced procedure states, "Upon satisfactory completion and acceptance of an NCR disposition, the QCE shall stamp on the applicable document(s) with an "Accept" stamp."

Contrary to the above, the following is a list of closed-out NCR's which do not have QCE stamps.

BC-00077	BP-00084	DJ-00001
BJ-00013	BP-00091	DP-00004
BM-00027	BP-00093	DP-00011
BP-00002	BP-00099	

Additionally, a conflict exists between the above procedural requirement and WPP/QCI-5.0, Rev. 4, BLock 31 of Appendix 1 which states, "The applicable Project Field QC. . .personnel. . . shall sign and record date of signing. . ."

HOUSTON LIGHTING & POWER
SOUTH TEXAS PROJECT ELECTRIC GENERATING STATION

QUALITY ASSURANCE
DEFICIENCY NOTICE

1 DN NO. 014
2 REV. 0

3 ORGANIZATION	4 DATE ISSUED	5 DATE DUE
Bechtel QC Department	2/24/83	3/17/83
6 DOCUMENT VIOLATED	7 REVISION	8 PARA.
BEC QCI-2.4	2	3.2/4.2

1 9 DESCRIPTION OF DEFICIENCY

See Continuation Sheet

10 INITIATOR	DATE
Doris Teague	2/23/83
11 REVIEW & APPROVAL	DATE
MHubbard for CO Wright	2/24/83
12 PERSON CONTACTED / POSITION	DATE
P Arleggins / PQCE	2-24-83

2 13 REMEDIAL ACTION

14 SIGNATURE	DATE	15 EFFECTIVITY DATE

3

16 RESPONSE ACCEPTANCE-INITIATOR	DATE	17 SUPERVISOR APPROVAL	DATE

18 VERIFICATION PERFORMED BY DATE ☐ SATISFACTORY ☐ UNSATISFACTORY CAR NO.

19 QA CLOSURE – INITIATOR DATE REVIEW & APPROVAL DATE

20 CC LIST

H.A. WALKER
L.W. HURST
J.E. ESTELLA

PQA-039 (10/82)

HL&P QA DEFICIENCY NOTICE CONTINUATION

(1) DN NO. 014

(2) REVISION 0

BEC QCI-2.4, Rev. 2, PCN #3, Quality Control Surveillance/Redundant Inspection Instructions.

Paragraphs 3.2 and 4.2 state, that concerns developed during surveillance reviews and redundant inspections "may be conveyed (to the contractor/constructor) verbally, but shall be followed by written notification with a formal reply within five (5) working days defining action taken or action intended to resolve the problem."

Contrary to the above requirement, formal replies from the contractor/constructor are not being received within five (5) working days. A group of surveillance inspection reports, identifying concerns was transmitted to the contractor/constructor on 11/29/82 (ST-YQ-QS-00154) and the formal reply from the contractor/constructor was not transmitted until 12/22/82 (ST-QS-YQ-00136).

HOUSTON LIGHTING & POWER
SOUTH TEXAS PROJECT ELECTRIC GENERATING STATION

QUALITY ASSURANCE
DEFICIENCY NOTICE

1 DN NO. 023
2 REV. 0

3 ORGANIZATION BEC Quality Assurance	4 DATE ISSUED 3/1/83		5 DATE DUE N/A
6 DOCUMENT VIOLATED PQAP 7.13	7 REVISION 0		8 PARA. 3.13

9 DESCRIPTION OF DEFICIENCY

1 The above document requires selected Quality Surveillance Plans to be evaluated by performing an in-depth review for:

a) Accuracy of translation of drawings/specifications;
b) Basis for determining inspection level

No objective evidence is available to show that any Quality Surveillance Plans have received this additional evaluation after initial approval.

10 INITIATOR RMM Doris Teague		DATE 2/24/83
11 REVIEW & APPROVAL C. O. Wright		DATE 3/1/83
12 PERSON CONTACTED K.R. Dotterer	POSITION PQAE	DATE 2-18-83

13 REMEDIAL ACTION

2 None - This selection is based or a determination by PQAE during regular review whether the complexity of the items and related plan requires an in depth review. To date, none of the PSQD originated plans are of that nature.

14 SIGNATURE RMM K R Dotterer	DATE 2-25-83	15 EFFECTIVITY DATE N/A

3

16 RESPONSE ACCEPTANCE-INITIATOR RMM Doris Teague	DATE 2/28/83	17 SUPERVISOR APPROVAL C. O. Wright	DATE 3/1/83
18 VERIFICATION PERFORMED BY DATE RMM* Doris Teague	☒ SATISFACTORY ☐ UNSATISFACTORY		CAR NO. N/A
19 QA CLOSURE - INITIATOR Doris Teague	DATE 3/1/83	REVIEW & APPROVAL C. O. Wright	DATE 3/2/83

* Per telephone conversation 3/1/83

20 CC LIST

H.A. WALKER
L.W. HURST
J.E. ESTELLA
B. DOTTERER
C. FOUSE

PQA-059 (10/82)

HOUSTON LIGHTING & POWER
SOUTH TEXAS PROJECT ELECTRIC GENERATING STATION

QUALITY ASSURANCE
DEFICIENCY NOTICE

1 DN NO. 024
2 REV. 0

3 ORGANIZATION BEC Quality Assurance	4 DATE ISSUED ~~2/23/83~~ 3/1/83	5 DATE DUE N/A
6 DOCUMENT VIOLATED PQAP 4.3/PQPM Appendix A	7 REVISION 0/2	8 PARA. 4.1/6.1

9 DESCRIPTION OF DEFICIENCY

1 The above reference documents conflict as to when the Division Manager, Quality Assurance, approves revisions to the Project Quality Program Manual:

a) PQAP requires all Bechtel approvals prior to HL&P approval

b) PQPM requires Division Manager QA approval subsequent to HL&P approval.

NOTE: PQPM, Rev. 3 submitted to HL&P prior to Division Manager QA approval.

10 INITIATOR KMM Doris Teague	DATE 2/20/83
11 REVIEW & APPROVAL C. O. Wright	DATE 3/1/83
12 PERSON CONTACTED K.R. Dotterer — POSITION PQAE	DATE 2-18-83

13 REMEDIAL ACTION

2 PQAP states "approval" this is accomplished and documented by use of DRN, the PQPM states "concurrence" not approval. There is no conflict, however, PQAP 4.3 paragraph 4.1 will be revised to clarify by adding the Division Manager of QA concurrence function.

14 SIGNATURE K.R. Dotterer	DATE 2-25-83	15 EFFECTIVITY DATE 4-15-83

16 RESPONSE ACCEPTANCE-INITIATOR KMM Doris Teague — DATE 2/28/83	17 SUPERVISOR APPROVAL C. O. Wright — DATE 3/1/83

3 18 VERIFICATION PERFORMED BY DATE ☐SATISFACTORY ☐UNSATISFACTORY CAR NO.

19 QA CLOSURE – INITIATOR DATE REVIEW & APPROVAL DATE

20 CC LIST

H. A. WALKER
L. W. HURST
J. E. ESTELLA
B. DOTTERER
C. FOUSE

X

PQA-059 (10/82)

QUALITY ASSURANCE
DEFICIENCY NOTICE

1 DN NO. 025
2 REV. 0

3 ORGANIZATION BEC Quality Assurance	4 DATE ISSUED 3/1/83	5 DATE DUE N/A
6 DOCUMENT VIOLATED LAQADP 8.2 (STP)	7 REVISION 5	8 PARA. 5.2

9 DESCRIPTION OF DEFICIENCY

1 The above referenced document requires the organization/group providing training (i.e. Units 1, 2, and 3 from training manual) to notify the QA Manager/Audits in writing the names and employee numbers of personnel completing prescribed training for input into the personnel data system. There is no objective evidence to show this information has been provided.

10 INITIATOR KMM Doris Teague		DATE 2/24/83
11 REVIEW & APPROVAL C. O. Wright		DATE 3/1/83
12 PERSON CONTACTED K.R. Dotterer	POSITION PQAE	DATE 2-18-83

13 REMEDIAL ACTION

2 The QA/Manager Audit will be notified in writing of the completed training required for Unit I, Unit II, parts one, two and three. However, it is not the Project's responsibility to comply with Unit III because paragraph 5.2 states: "organization/group providing the training." The Project does not provide BPC Uniform Auditor Training," that is provided by the QA Manager/Audits or his designee.

14 SIGNATURE K.R. Dotterer	DATE 2-25-83	15 EFFECTIVITY DATE 3-18-83

16 RESPONSE ACCEPTANCE–INITIATOR KMM Doris Teague	DATE 2/28/83	17 SUPERVISOR APPROVAL C. O. Wright	DATE 3/1/83

3 18 VERIFICATION PERFORMED BY DATE ☐ SATISFACTORY ☐ UNSATISFACTORY CAR NO.

19 QA CLOSURE – INITIATOR DATE REVIEW & APPROVAL DATE

20 CC LIST

H.A. WALKER
L.W. HURST
J.E. ESTELLA
B. DOTTERER
C. FOUSE

X

PQA-059 (10/82)

HOUSTON LIGHTING & POWER
SOUTH TEXAS PROJECT ELECTRIC GENERATING STATION

QUALITY ASSURANCE
DEFICIENCY NOTICE

1 DN NO. 026
2 REV. 0

3 ORGANIZATION	4 DATE ISSUED	5 DATE DUE
BEC Quality Assurance	3/1/83	N/A
6 DOCUMENT VIOLATED	**7 REVISION**	**8 PARA.**
PQAP 3.5	Interim	5.2.5

9 DESCRIPTION OF DEFICIENCY

1 The above reference document requires that Quality Surveillance Discrepancy Reports be included in the Trending Program. There is no objective evidence that Quality Surveillance Discrepancy Reports were being trended.

10 INITIATOR		DATE
RMK Doris Teague		2/24/83
11 REVIEW & APPROVAL		**DATE**
C. O. Wright		3/1/83
12 PERSON CONTACTED	**POSITION**	**DATE**
K.R. Dotterer	PQAE	2-18-83

13 REMEDIAL ACTION

2 Since the effective date of PQAP 3.5 only (1) one S/R closed QSDR has been received. This document was reviewed and "trended" during the audit, no trends identified. As part of revision "0" to PQAP 3.5 clarification will be added to paragraph 5 (a) to indicated only Closed QSDRs are subject to trending.

14 SIGNATURE	DATE	15 EFFECTIVITY DATE
K.R. Dotterer	2-25-83	3-15-83

16 RESPONSE ACCEPTANCE-INITIATOR	DATE	17 SUPERVISOR APPROVAL	DATE
3 RMK Doris Teague	2/28/83	C. O. Wright	3/1/83

18 VERIFICATION PERFORMED BY DATE ☐SATISFACTORY ☐UNSATISFACTORY CAR NO.

19 QA CLOSURE - INITIATOR DATE REVIEW & APPROVAL DATE

20 CC LIST

H. A. WALKER
L. W. HURST
J. E. ESTELLA
B. DOTTERER
C. FOUSE

X

PQA-059 (10/82)

HOUSTON LIGHTING & POWER
SOUTH TEXAS PROJECT ELECTRIC GENERATING STATION

QUALITY ASSURANCE
DEFICIENCY NOTICE

1 DN NO. 027
2 REV. 0

3 ORGANIZATION BEC Quality Assurance	4 DATE ISSUED 3/1/83	5 DATE DUE N/A
6 DOCUMENT VIOLATED PQAP 4.3	7 REVISION 0	8 PARA. 4.1

9 DESCRIPTION OF DEFICIENCY

1 The above reference document requires that applicable sections of the Project Quality Program Manual (PQPM) be transmitted to Engineering, Procurement and Construction for review/comment prior to issue. There was no objective evidence presented which shows that PQPM, Rev. 2, Sections 2, 3, 15 and 18 were reviewed by Construction prior to issue.

10 INITIATOR RWM Doris Teague		DATE 2/24/83
11 REVIEW & APPROVAL C. O. Wright		DATE 3/1/83
12 PERSON CONTACTED K.R. Potter	POSITION PQAE	DATE 2-18-83

13 REMEDIAL ACTION

2 None required, these revised sections as referenced above were reviewed and a determination was made that the changes were not applicable to construction, however, PQAP 4.3 will be revised to clarify the condition which requires revised sections of PQPM to be coordinated on DRN to appropriate departments. Future DRNs will be issued to reflect the clarified PQAP.

14 SIGNATURE K.R. Potter	DATE 2-25-83	15 EFFECTIVITY DATE 4-15-83

16 RESPONSE ACCEPTANCE - INITIATOR RWM Doris Teague	DATE 2/28/83	17 SUPERVISOR APPROVAL C. O. Wright	DATE 3/1/83

3 18 VERIFICATION PERFORMED BY DATE ☐SATISFACTORY ☐UNSATISFACTORY CAR NO.

19 QA CLOSURE - INITIATOR DATE REVIEW & APPROVAL DATE

20 CC LIST

H. A. WALKER
L. W. HURST
J. E. ESTELLA
B. DOTTERER
C. FOUSE

X

PQA-059 (10/82)

REVAMPED SOUTH TEXAS PROJECT SHOWING STRONG SIGNS OF RECOVERY

A major extant lawsuit, squabbling among partners and a perhaps lingering bad reputation aside, the South Texas Project appears to have been removed from its former position among the most troubled nuclear plant projects in the U.S. While this assessment, not surprisingly, is held by the lead utility, Houston Lighting & Power, in the consortium building the two 1,250-Mw PWRs, it is shared by NRC staff. "The progress they have made to date has been significant," said a top NRC staff source, noting that such a conclusion was reached in general in Nureg 0948, a recently issued inspection by NRC of a design review of the project. "I don't want to go out on a limb and say it's a model project," the NRC source said, "but it has all the makings of being an effective program they have there. Only time will tell once they get into full swing how well their program works."

By full swing he was referring to complete resumption of safety-related work, re-initiated in part last August after HL&P voluntarily halted such work after the discovery that the project was being strangled by a lack of progress on nuclear engineering by then architect-engineer Brown & Root, since replaced as a-e and constructor by Bechtel and Ebasco, respectively. Not only have the principal contractors been changed, but so too has HL&P. "It's almost a whole new project," said one source.

Since October 1980 HL&P has established a host of new positions and departments to manage South Texas and interface with the new contractors, including a vice president of nuclear engineering & construction, a vice president of nuclear operations, a quality assurance manager, a site construction manager, a project engineering manager, a nuclear licensing department (formerly part of the nuclear services department), a general manager of nuclear engineering (with a-e and previous nuclear utility experience), and an engineering assurance organization.

This last entity is described by a source as "a blue ribbon high-powered audit team that reviews HL&P and the contractors." It consists of three utility persons with no prior experience at South Texas working with Stone & Webster in an engineering oversight capacity. The source noted that distinct potential exists for clashes between major competitors Stone & Webster and project a-e Bechtel as one checks the work of the other, but that the two firms "agreed at the highest levels to work together."

The experience level of the new contractors and in-house staff added by HL&P is mentioned repeatedly as a major factor in the project's revival. Noting Brown & Root's relative inexperience in large-scale nuclear plants at the time it took on the South Texas job, a source said, "Brown & Root concentrated on areas that it was familiar with, which was not the nuclear side." In fact, the Quadrex Corp. study of May 1981 which formally documented the poor progress on the project was sparked by HL&P's discovery that nuclear-related construction was stymied by the absence of real movement on nuclear engineering.

The fact that so little had been done on the engineering side turned out to be an advantage to Bechtel, one source said, in that it could take a relatively fresh rather than remedial posture, with the same holding true even more for Ebasco. To date, remedial work has been primarily in engineering, with only a small amount of actual material changes. Full resumption of safety-related work is expected by mid-summer.

In addition to its executive, top managerial and auditing changes, HL&P has added a number of "seasoned" engineers to develop what a source called system engineering capability; these engineers, the source said, have broad experience so that nuclear and non-nuclear positions of the South Texas units are approached from a more integrated stance.

The latest estimates show unit 1 to be 48% completed, with December 1986 as the target date for completion. The figures for unit 2 are 26% and December 1988. While the project goes forward, so too does a lawsuit by HL&P and its project partners against Brown & Root and its parent Halliburton for delays in the project. That suit is still in the discovery phase.

Summing up his view of HL&P's role in South Texas, an NRC source said, "They have a much different attitude than previously, but after you've been beaten over the head as much as they have that's bound to happen." – *Rob Laufer, New York*

The Light company Houston Lighting & Power P.O. Box 1700 Houston, Texas 77001 (713) 228-9211

March 24, 1983

ST-HS-YQ-00265
File No.: Q12.8
Q16.4

Mr. L. W. Hurst
Project QA Manager
Bechtel Energy Corporation
P. O. Box 15
Bay City, Texas 77414

SUBJECT: SOUTH TEXAS PROJECT ELECTRIC GENERATING STATION
PROJECT AUDIT REPORT NUMBER G08-301

Dear Mr. Hurst:

Attached is the Project Audit Report for Ebasco Quality Assurance/Quality Control Activities, Audit Number G08-301, conducted on February 16-23, 1983. The results are summarized as follows:

No. of Items Reviewed:	1406
No. of Deficiencies:	25
No. of Concerns:	3
No. of CARs:	5
No. of DNs:	9

Concern number one (1) requires a response; please submit your response to me by April 18, 1983. If you have any comments or require additional information, please contact Mr. M. S. Monteith at extension 2359.

Very truly yours,

H. A. Walker

H. A. Walker
Project QA Manager
South Texas Project

HAW/JWB:cf
Attachment

cc: G. W. Oprea, Jr.
J. E. Geiger
D. G. Barker
R. J. Maroni
S. M. Dew
J. W. Williams
R. L. Ulrey
E. A. Turner
A. R. Beavers
J. G. Dewease
J. H. Goldberg
L. B. Horrigan
R. P. Murphy
M. S. Monteith
D. T. Krisha (BPC)
B. L. Lex (BEC)
R. W. Miller (BEC)
K. R. Dotterer (BEC)
B. R. McCullough (BEC)
C. L. Hawn (ESI)
Audit File G08-301
STP/RMS-SRC (w/o attachment)
Site Library

SOUTH TEXAS PROJECT AUDIT REPORT

AUDIT NUMBER: G08-301

Ebasco Quality Assurance/
Quality Control Activities

AUDITED ORGANIZATION:

Ebasco Services Incorporated
PO Box 1647
Bay City, Texas 77414

AUDIT DATE: February 16 - 23, 1983

AUDIT TEAM:

M. S. Monteith	Lead Auditor/Team Leader
S. K. Hubbard	Auditor
J. W. Estella	Auditor
T. H. McGriff	Auditor

MS Monteith 3/23/83
Lead Auditor Date

PERSONNEL CONTACTED:

		PRE AUDIT	DURING AUDIT	POST AUDIT
R. A. Cummings, Jr.	ESI QA Site Supervisor	X	X	X
R. G. Peck	ESI Lead QA Engineer-Site	X	X	X
F. E. Williamson	ESI Lead QC Engineer-Site		X	X
P. L. Boortz	ESI QA Records Supervisor	X	X	X
J. B. Cleere	ESI Quality Training Coordinator	X	X	X
R. P. Grippardi	ESI QC Site Supervisor	X	X	X
M. F. Perrin	ESI NCR Coordinator		X	
K. A. Norris	ESI QA Clerk		X	
S. R. Dana	ESI Civil Lead QC Engineer		X	
R. L. Elsey	ESI Civil QC Engineer		X	
W. E. Davis	ESI Mechanical Lead QC Engineer		X	
J. R. Shoop	ESI QA Clerk		X	
P. Higby	ESI QA Secretary/Clerk		X	
B. Kasper	ESI QA Records Specialist		X	
C. L. Hawn	ESI Quality Program Site Manager		X	
R. L. Staymates	ESI Mechanical QC Engineer		X	
L. Wilhelm	ESI QC Calibration Laboratory Supervisor		X	
M. R. McCarthy	ESI Asst. Quality Training Coordinator		X	

OBJECTIVE OF THE AUDIT:

To verify that Ebasco's Quality Assurance/Quality Control activities are programmatically in compliance with the project requirements and that adequate procedures exist and are being effectively implemented.

DEFICIENCIES:

1. HL&P PQAP, Rev. 1, Paragraph 12.3.4, states that "Calibration of measuring and test equipment is against standards that have accuracy of at least four times the required accuracy of the equipment being calibrated, or when it is not practicable, have an accuracy that assures the equipment being calibrated is within required tolerance and that the basis of acceptance is documented and authorized by responsible management.

DEFICIENCIES: (Conti.)

Contrary to this requirement, neither the Ebasco NQAPM, Section QA-III-13, Revision 2, or QCP 12.1, Revision 1, require the basis of acceptance to be documented and authorized by responsible management when the required 4:1 accuracy ratio cannot be met.

HL&P CAR No. G-224 issued.

2. QCP 15.1, "Identification of Control of Discrepancies and Nonconforming Conditions," Revision 2, Paragraph 5.6.10.1, states in part "After approval of Conditional Release for a NCR item...a dated, initialed entry (is) made in the QC NCR Log, noting the C.R. status."

   QCP 15.1, Revision 2, Paragraph 5.8.1.5, states "The latest revision number for the revised NCR shall be entered in the remarks column of the QC NCR Log."

   Contrary to these requirements, entries are not being made in the QC NCR Log as required by QCP 15.1, Paragraphs 5.6.10.1 and 5.8.1.5.

   HL&P CAR G-225 issued.

3. ESI NQAPM, Section QA-III-1, "Instructions, Procedures and Drawings," Revision 2, Paragraph 3.1, states in part "Implementing instructions, procedures or drawings for activities affecting quality at the construction site shall be developed by the...Site Quality Assurance for their respective quality-related function.

   Contrary to this requirement, the ESI Quality Program Site Manager issued a "Stop Work" against the issuance of bulk safety-related materials to Ebasco from Bechtel's warehouse by interoffice correspondence ST-QPSM-006-83. This method of stopping work is not described in approved site procedures.

   HL&P CAR No. G-226 issued.

4. ANSI N45.2-1971, "QA Program Requirements for Nuclear Power Plants," Section 6, states in part that "Activities affecting quality shall be prescribed by documented instructions, procedures or drawings...and shall be accomplished in accordance with these instructions, procedures or drawings."

   Contrary to this requirement, QCP 6.3, "Quality Control Review of Incoming Revisions/Changes to Bechtel Specifications and Procedures," Revision 0, was issued to the field on December 21, 1982, but was not implemented until January 31, 1983, even though numerous revisions/changes were made to Bechtel specifications and procedures during the time period that the procedure requirements were not implemented.

   HL&P CAR G-227 issued.

5. ESI NQAPM, Section QA-III-6, "Nonconformances," Revision 2, Paragraph 4.2, states "He (the QC Inspector) shall document the satisfactory correction or resolution of all nonconformances on the dispositioned Nonconformance Report. This documentation shall provide sufficiently detailed information for as-built documentation.

   Contrary to this requirement, QCP 15.1, Revision 2, does not provide this directive to Quality Control and QAI-004, Revision 2, does not direct Quality Assurance to review Nonconformance Reports for this requirement.

   HL&P CAR G-228 issued.

DEFICIENCIES: (Conti.)

6. QCP 16.1, "Corrective Action," Revision 1, Paragraph 5.9, states "If the originating organization determines that the corrective action and response is adequate and the report is closed, this shall be noted in the Log of Required Corrective Action."

   Contrary to this requirement, many BEC, ESI and HL&P QFRs and CARs are listed in the log as still open, even though the originating organization has closed the item. Examples: HL&P CARs HG-38, HG-40, G-183, G-184 and G-185

   HL&P DN No. 015 issued.

7. QCP 6.3, "QC Review of Incoming Revisions/Changes to Bechtel Specifications and Procedures," Revision 0, Paragraph 5.2, states in part "The assigned QC Engineer shall use the Log for QC Review of Bechtel Specification/Procedure Revisions (Attachment A)..."

   Contrary to this requirement, the log presently being used by QC is not the same log as depicted on Attachment A of the procedure.

   HL&P DN No. 016 issued.

8. QCP 16.1, "Corrective Action," Revision 1, Paragraph 5.7.1, states that "The written response (to the audit, surveillance or inspection) shall be reviewed and approved by the Quality Control Site Supervisor prior to transmittal. All written responses shall be transmitted under the signature of the QCSS."

   Contrary to this requirement, there is no objective evidence that the QCSS was transmitting the written response by formal transmittals. The responsibility for transmitting responses is with ESI QA as defined in QAI-006.

   HL&P DN No. 017 issued.

9. QCP 15.1, "Identification and Control of Discrepancies and Nonconforming Conditions," Revision 2, Paragraph 5.2.2, states in part "The inspector shall submit the Deficiency Notice...to the responsible Lead Quality Control Engineer for this review and evaluation."

   QCP 15.1, Revision 2, Paragraph 5.2.3, states in part "...the Lead QA Engineer... shall record, sign and date his decision...on the DN..."

   Contrary to these requirements, Deficiency Notices (DNs) Nos. 006-C, 008-C and 009-C were reviewed, evaluated signed and dated by an individual other than the Lead Quality Control Engineer.

   HL&P DN No. 018 issued.

10. QCP 12.1, "Calibration of Measuring and Test Equipment," Revision 1, Paragraph 5.9.5.1, states "The original of the closed Deficient Controlled M&TE Evaluation Report shall be transmitted to the QA Records Vault and a copy retained in the M&TE history file."

    Contrary to this requirement, copies of closed Deficient Controlled M&TE Evaluation Reports were not retained in all applicable M&TE history files.

    HL&P DN No. 019 issued.

DEFICIENCIES: (Conti.)

11. QAI-010, "Site QA Records," Revision 2, Paragraph 6.1, states in part "All documents which are designated as permanent in Section 5.1...shall be transmitted upon completion to the Ebasco Quality Records Supervisor for processing and transmittal to Bechtel Site Quality Assurance..."

    Contrary to this requirement, transmittal and processing of records is governed by QAI-016 and turnover of completed packages to HL&P RMS and BEC is governed by QAI-019. Neither procedure is referenced by QAI-010 nor are they included in Section 6.1.

    HL&P DN No. 020 issued.

12. QAI-001, "Site QA Organization and Responsibilities," Revision 1, Paragraph 4.4.2, states that "The NCR Coordinator is responsible for submittal of records generated by the Site QA Group to the QA Records Coordinator."

    Contrary to this requirement, the NCR Coordinator is not performing this function.

    HL&P DN No. 021 issued.

13. ESI NQAPM, Section QA-I-3, "Personnel Indoctrination and Training Program in QA," Revision 2, Paragraph 3.3, states in summation that the "Quality Assurance Engineering Department shall maintain copies of training lessons on file."

    Contrary to this requirement, there is no site implementing procedure which describes this responsibility. Copies of training lessons are kept on file in the QA Training Department.

    HL&P DN No. 022 issued.

14. QAI-004, "Issuance and Processing of Nonconformance Reports," Revision 2, Paragraph 6.3.10.3, states in part "Upon request from the cognizant discipline Lead QC Engineer, the NCR Coordinator shall transmit the original NCR to QC for completion of Block 26..."

    Contrary to this requirement, the NCR Coordinator does not utilize a formal transmittal to transmit the original NCR to QC for completion of Block 26 (Acceptance of New Work/Rework/Repairs).

    HL&P DN No. 028 issued.

15. QAI-007, "Reportable Deficiencies," Revision 0, Paragraph 5.4, states that "The QAE shall submit a copy of the memo (potentially reportable deficiency) transmitted to BEC to the NCR Coordinator for filing with the applicable NCR and audit finding."

    Contrary to this requirement, NCR No. CC-00286 did not have a copy of the memo of potential reportability in its NCR file. A copy of the memo was obtained by the NCR Coordinator and placed in the NCR file during the course of the audit.

    No further action required.

DEFICIENCIES: (Conti.)

16. QCP-15.1, "Identification and Control of Discrepancies and Nonconforming Conditions," Revision 2, Paragraph 5.3.3, states in part "The responsible Lead QC Engineer shall maintain a copy of the DN sequentially in a binder . . ."

    Contrary to this requirement, the Lead QC Engineer - Mechanical was not maintaining DN's in a sequential order. This discrepancy was corrected during the course of the audit.

    No further action required.

17. QCP-15.1, "Identification and Control of Discrepancies and Nonconforming Conditions," Revision 2, Paragraph 5.3.7, states in part ". . . in cases where acceptable resolution of DN's is not accomplished in a timely manner, a memo shall be issued to the responsible organization requesting action . . ."

    Contrary to this requirement, acceptable resolution of DN's is not being accomplished in a timely manner and memos are not being issued to the responsible organization requesting action. This discrepancy was identified and documented during ESI Audit No. EQA-028, Quality Finding Report (QFR) No. 1. This discrepancy will be tracked and closed-out on QFR No. 1 of Audit No. EQA-028, pending satisfactory verification of action taken to correct discrepancy and to preclude repetition.

18. QAI-004, Revision 2, "Issuance and Processing of Nonconformance Reports," Paragraph 6.3.9.2, states that "The NCR Coordinator shall then transmit the RDN along with the NCR original to the Senior Resident Engineer for a revised disposition and shall enter the date of turnover in the NCR Log under "RDN Out SRE."

    Contrary to this requirement, NCR No. FP-00082 had no RDN issued by BEC but an entry was made in error in the NCR Log under "RDN Out SRE." SRE had requested the NCR to revise a section he was responsible for. Entry under "RDN Out SRE" was lined through, initialed and dated during the course of the audit and an entry was made under "Disposition Log Out SRE" to track NCR No. FP-00082.

    No further action required.

19. QCP-12.1, "Calibration and Control of Measuring and Test Equipment", Revision 1, Paragraph 5.2.1 states "In cases where equipment is calibrated offsite by a public or private testing laboratory, the laboratory shall be qualified and approved in accordance with Ebasco QA Program requirements."

    Contrary to this requirement, offsite calibration services are procured in accordance with ASP-3 and QAI-009 which does not require Ebasco Vendor qualification as required by ESI NQAPM, Section QA-I-5, "QA Evaluation of Supplier Contractor." This discrepancy was previously documented on CAR No. 1 of ESI Audit No. 83-01. Resolution and closure of this discrepancy will be tracked on CAR No. 1.

DEFICIENCIES: (Conti.)

20. QCP-12.1, "Calibration and Control of Measuring and Test Equipment", Revision 1, Paragraph 5.5.8, states in part, ". . .the calibration interval may be lengthened if the items history shows the equipment to be consistently within the accuracy limits each time the equipment is calibrated. The reason for change in calibration interval shall be recorded on the Calibration Record Card."

    Contrary to this requirement, the calibration intervals for ST-CC-0440, 0441 and 1064 were lengthened, but the reason for the change was not recorded on their Calibration Record Card. This discrepancy was previously documented by Ebasco on CAR No. 2 of ESI Audit 83-01 for ST-CC-2281 through 2290. As a result of CAR No. 2, all Calibration Records Cards are being reviewed and corrected, as applicable. This discrepancy has been corrected for ST-CC-0440, 0441 and 1064.

    No further action required.

CONCERNS:

1. QCP-6.3, Revision 0, "QC Review of Incoming Revisions/Changes to Bechtel Specifications and Procedures" needs to be reviewed and actions taken to do the following:

    a. Upon receipt of a change/revision to a Bechtel specification or procedure priorities must be established to expedite the corresponding QCP change/revision when the Bechtel change/revision directly affects QC inspection criteria for activities in progress.

    b. Decrease the overall amount of time it takes from receipt of a change/revision to a Bechtel specification or procedure until a corresponding QCP change/revision is issued to the field. Changes/revisions to QCP's are presently taking approximately four to eight weeks.

    A written response to this concern stating what actions you have taken to improve this system for handling changes/revisions to QCP's is requested on or before April 18, 1983.

2. QCP-12.1, Revision 1, "Calibration and Control of Measuring and Test Equipment," Paragraph 5.3.3., states that "The Calibration Laboratory is sufficiently isolated from potential sources of radiation, radio frequencies and electromagnetic interferences to preclude adversely affecting calibration activities."

    The Calibration Laboratory was not able to produce any objective evidence to verify this statement in the procedure. If this statement is not verifiable then it should be deleted from the procedure or revised such that it can be verified.

3. QAI-004, Revision 2, "Issuance and Processing of Nonconformance Reports," does not require or provide for:

    a. "Logging Out" when "Revised Disposition" is sent to QAE for concurrence and "Logging In" when "Revised Disposition" concurrence from QAE is received.

CONCERNS: (Conti.)

b. "Logging Out" for "Revised Disposition" when SRE requests NCR be sent to him for revision ("NCR Status Log" requires an entry for tracking return to SRE only when RDN is issued by BEC).

AUDIT SUMMARY:

The results of the audit revealed a satisfactory degree of adequacy and implementation of the Ebasco QA program and procedures with the exception of the deficiencies noted within this audit report. Ebasco's QA/QC activities were audited for compliance to the following 10CFR50, Appendix B, criteria:

Criterion I	Organization
Criterion II	QA Program
Criterion XII	Control of Measuring and Test Equipment
Criterion XIV	Inspection, Test and Operating Status
Criterion XV	Nonconforming Materials, Parts and Components
Criterion XVI	Corrective Action
Criterion XVII	Quality Assurance Records
Criterion XVIII	Audits

ATTACHMENTS:

HL&P CAR No. G-224
HL&P CAR No. G-225
HL&P CAR No. G-226
HL&P CAR No. G-227
HL&P CAR No. G-228
HL&P DN No. 015
HL&P DN No. 016
HL&P DN No. 017
HL&P DN No. 018
HL&P DN No. 019
HL&P DN No. 020
HL&P DN No. 021
HL&P DN No. 022
HL&P DN No. 028
ESI CAR No. 1
ESI CAR No. 2

PQA-042 (9/82)

The Light company

SOUTH TEXAS PROJECT ELECTRIC GENERATING STATION
HOUSTON LIGHTING & POWER

QUALITY ASSURANCE
CORRECTIVE ACTION REPORT

(1) CAR No. G-224

(2) REVISION 0

1

(3) ORGANIZATION Ebasco QA/QC	(4) DEF REQUIRED ☐ YES ☒ NO	(5) RESPONSE DUE DATE 03-27-83
(6) DOCUMENT VIOLATED HL&P PQAP	REV. 1	PARA. 12.3.4

(7) DESCRIPTION OF CONDITION ADVERSE TO QUALITY

The above referenced document states: "Calibration of measuring and test equipment is against standards that have accuracy of at least four times the required accuracy of the equipment being calibrated, or when this is not practicable, have an accuracy that assures the equipment being calibrated is within required tolerance and that the basis of acceptance is documented and authorized by responsible management." Contrary to this requirement, neither the Ebasco NQAPM, Section QA-III-13, Revision 2 or QCP-12.1,

(8) REPORTED BY: MS Montsuk	DATE: 2/24/83
(9) REVIEW AND APPROVAL [signature]	DATE: 2/24/83

2

(10) REMEDIAL ACTION

(11) SIGNATURE	DATE:	(12) EFFECTIVE DATE:

3

(13) CAUSE OF CONDITION

(14) CORRECTIVE ACTION TO PREVENT RECURRENCE

(15) REVIEW AND APPROVAL	DATE:	(16) EFFECTIVE DATE:

4

(17) HL&P INITIATOR:	☐ ACCEPT ☐ REJECT	SUPERVISOR	DATE
(18) VERIFICATION PERFORMED BY	☐ SAT ☐ UNSAT	SUPERVISOR	DATE
(19) HL&P QA CLOSURE:			DATE

PQA-042 (9/82)

The Light company

SOUTH TEXAS PROJECT ELECTRIC GENERATING STATION
HOUSTON LIGHTING & POWER

QUALITY ASSURANCE
CORRECTIVE ACTION REPORT

(1) CAR No. G-225

(2) REVISION 0

1

(3) ORGANIZATION	(4) DEF REQUIRED	(5) RESPONSE DUE DATE
Ebasco Quality Control	☐ YES ☐ NO	03-27-83

(6) DOCUMENT VIOLATED	REV.	PARA.
QCP-15.1	2	5.8.1.5/5.6.10.1

(7) DESCRIPTION OF CONDITION ADVERSE TO QUALITY

See Continuation Sheet Page 2 of 2

(8) REPORTED BY: MS Monteith DATE: 2/23/83

(9) REVIEW AND APPROVAL DATE: 2/23/83

2

(10) REMEDIAL ACTION

(11) SIGNATURE DATE: (12) EFFECTIVE DATE:

3

(13) CAUSE OF CONDITION

(14) CORRECTIVE ACTION TO PREVENT RECURRENCE

(15) REVIEW AND APPROVAL DATE: (16) EFFECTIVE DATE:

4

(17) HL&P INITIATOR: ☐ ACCEPT ☐ REJECT SUPERVISOR DATE

(18) VERIFICATION PERFORMED BY: ☐ SAT ☐ UNSAT SUPERVISOR DATE

(19) HL&P QA CLOSURE: DATE:

HL&P QA CORRECTIVE ACTION REPORT CONTINUATION

(1) CAR NO. G-225

(2) REVISION 0

Block 7 Description of Condition Adverse to Quality

1) QCP-15.1 Rev. 2, Paragraph 5.6.10.1 states: "After approval of Conditional Release for a NCR item...a dated, initialed entry (is) made in the QC NCR Log, noting the C.R. status."

2) QCP-15.1 Rev. 2, Paragraph 5.8.1.5 states: "The latest revision number for the revised NCR shall be entered in the remarks column of the QC NCR Log."

Contrary to the above, entries are not being made in the QC NCR Log as required by the procedure.

PQA-042 (9/82)

The Light company

SOUTH TEXAS PROJECT ELECTRIC GENERATING STATION
HOUSTON LIGHTING & POWER

QUALITY ASSURANCE
CORRECTIVE ACTION REPORT

(1) CAR No. G-226
(2) REVISION 0

1

(3) ORGANIZATION	(4) DEF REQUIRED	(5) RESPONSE DUE DATE
Ebasco Quality Assurance	☐ YES ☒ NO	03-27-83

(6) DOCUMENT VIOLATED	REV.	PARA.
NQAPM Section QA-III-1	2	3.1

(7) DESCRIPTION OF CONDITION ADVERSE TO QUALITY

See Page 2 of 2.

(8) REPORTED BY: MS Monteith DATE: 2/23/83

(9) REVIEW AND APPROVAL DM Bohner DATE: 2/23/83

2

(10) REMEDIAL ACTION

(11) SIGNATURE | DATE: | (12) EFFECTIVE DATE:

3

(13) CAUSE OF CONDITION

(14) CORRECTIVE ACTION TO PREVENT RECURRENCE

(15) REVIEW AND APPROVAL | DATE: | (16) EFFECTIVE DATE:

4

(17) HL&P INITIATOR: ☐ ACCEPT ☐ REJECT | SUPERVISOR | DATE

(18) VERIFICATION PERFORMED BY: ☐ SAT ☐ UNSAT | SUPERVISOR | DATE

(19) HL&P QA CLOSURE | DATE

HL&P QA CORRECTIVE ACTION REPORT CONTINUATION

(1) CAR NO. G-226

(2) REVISION 0

BLOCK (7) DESCRIPTION OF CONDITION ADVERSE TO QUALITY

NQAPM Section QA-III-1, Paragraph 3.1 states "Implementing instructions, procedures, or drawings for activities affecting quality at the construction site shall be developed by the. . .Site Quality Assurance for their respective quality-related functions.

Contrary to this requirement, the Ebasco Quality Program Site Manager issued a Stop Work against the issuance of bulk safety-related materials to Ebasco from Bechtel's warehouse by interoffice correspondence ST-QPSM-006-83. This method of stopping work is not described in approved site procedures.

PQA-042 (9/82)

The Light company

SOUTH TEXAS PROJECT ELECTRIC GENERATING STATION
HOUSTON LIGHTING & POWER

QUALITY ASSURANCE
CORRECTIVE ACTION REPORT

(1) CAR No. G-227

(2) REVISION 0

1

(3) ORGANIZATION	(4) DEF REQUIRED	(5) RESPONSE DUE DATE
Ebasco Quality Control	☐ YES ☒ NO	
(6) DOCUMENT VIOLATED ANSI N45.2	REV. 1971	PARA. 6

(7) DESCRIPTION OF CONDITION ADVERSE TO QUALITY

See Page 2 of 2.

(8) REPORTED BY: MS Monteith	DATE: 2/23/83
(9) REVIEW AND APPROVAL	DATE: 2/23/83

2

(10) REMEDIAL ACTION

(11) SIGNATURE	DATE:	(12) EFFECTIVE DATE:

3

(13) CAUSE OF CONDITION

(14) CORRECTIVE ACTION TO PREVENT RECURRENCE

(15) REVIEW AND APPROVAL	DATE:	(16) EFFECTIVE DATE:

4

(17) HL&P INITIATOR	☐ ACCEPT ☐ REJECT	SUPERVISOR	DATE
(18) VERIFICATION PERFORMED BY	☐ SAT ☐ UNSAT	SUPERVISOR	DATE
(19) HL&P QA CLOSURE			DATE

HL&P QA CORRECTIVE ACTION REPORT CONTINUATION

(1) CAR NO. G-227

(2) REVISION 0

BLOCK (7) DESCRIPTION OF CONDITION ADVERSE TO QUALITY

ANSI N45.2-1971, "QA Program Requirements For Nuclear Power Plants", section 6, states in part that "activities affecting quality shall be prescribed by documented instructions, procedures or drawings . . .and shall be accomplished in accordance with these instructions, procedures or drawings."

Contrary to this requirement, QCP-6.3, "Quality Control Review of Incoming Revisions/Changes to Bechtel Specifications and Procedures," Rev. 0, was issued to the field on December 21, 1982, but was not implemented until January 31, 1983, even though numerous revisions/ changes were made to Bechtel specifications and procedures during the time period that the procedure requirements were not implemented.

PQA-042 (9/82)

The Light company

SOUTH TEXAS PROJECT ELECTRIC GENERATING STATION
HOUSTON LIGHTING & POWER

QUALITY ASSURANCE
CORRECTIVE ACTION REPORT

(1) CAR No. G-228

(2) REVISION 0

1

(3) ORGANIZATION	(4) DEF REQUIRED	(5) RESPONSE DUE DATE
Ebasco Quality Control/Quality Assurance	☐ YES ☒ NO	03-27-83
(6) DOCUMENT VIOLATED: ESI NQAPM, Section QA-III-6	REV. 2	PARA. 5.2

(7) DESCRIPTION OF CONDITION ADVERSE TO QUALITY

See Continuation Sheet, Page 2 of 2.

(8) REPORTED BY: MS Monteith DATE: 2/23/83

(9) REVIEW AND APPROVAL: [signature] DATE: 2/23/83

2

(10) REMEDIAL ACTION

(11) SIGNATURE | DATE: | (12) EFFECTIVE DATE:

3

(13) CAUSE OF CONDITION

(14) CORRECTIVE ACTION TO PREVENT RECURRENCE

(15) REVIEW AND APPROVAL | DATE: | (16) EFFECTIVE DATE

4

(17) HL&P INITIATOR ☐ ACCEPT ☐ REJECT | SUPERVISOR | DATE

(18) VERIFICATION PERFORMED BY ☐ SAT ☐ UNSAT | SUPERVISOR | DATE

(19) HL&P QA CLOSURE | DATE

HL&P QA CORRECTIVE ACTION REPORT CONTINUATION

(1) CAR NO. G-228

(2) REVISION 0

BLOCK (7) DESCRIPTION OF CONDITION ADVERSE TO QUALITY

ESI NQAPM, Section QA-III-6, Paragraph 4.2 states "He (the QC Inspector) shall document the satisfactory correction or resolution of all nonconformances on the dispositioned Nonconformance Report. This documentation shall provide sufficiently detailed information for as-built records."

Contrary to this requirement:

1) QCP-15.1, Rev. 2 does not provide this directive to Quality Control

2) QAI-004, Rev. 2 does not direct Quality Assurance to review Nonconformance Reports for this requirement.

Attachment: HL&P Audit G08-301

HOUSTON LIGHTING & POWER
SOUTH TEXAS PROJECT ELECTRIC GENERATING STATION

QUALITY ASSURANCE
DEFICIENCY NOTICE

1 DN NO. 015
2 REV. 0

3 ORGANIZATION	4 DATE ISSUED	5 DATE DUE
Ebasco Quality Control	2/25/83	3/18/83
6 DOCUMENT VIOLATED QCP-16.1	7 REVISION 1	8 PARA. 5.9

9 DESCRIPTION OF DEFICIENCY

1 QCP-16.1, Paragraph 5.9 states, "If the originating organization determines that the corrective action and response is adequate and the report is closed, this shall be noted in the Log of required Corrective Action."

Contrary to this requirement, many BPC, ESI, and HL&P, QFR's, and CAR's are listed in the log as still open, even though the originating organization has closed the item. Examples: HL&P CAR's HG-38, HG-40, HC-123, G-184, G-183, & G-185.

10 INITIATOR MS Monteith	DATE 2/23/83
11 REVIEW & APPROVAL [signature]	DATE 2/24/83
12 PERSON CONTACTED F.E. WILLIAMSON — POSITION ESI LEAD QC ENGINEER - SITE	DATE 2/24/83

13 REMEDIAL ACTION

2 This condition is a result of a lack of formal notification to ESI QC, from the originating organization, that the corrective action is adequate and the report is closed.

QCP-16.1, REV 1, is presently being revised to read: "Upon written notification that the originating organization has determined that the corrective action and response is adequate and the report is closed, this shall be noted in the Log of Required Corrective Action."

14 SIGNATURE	DATE	15 EFFECTIVITY DATE
RP Guffardi	3-10-83	3-18-83

16 RESPONSE ACCEPTANCE-INITIATOR	DATE	17 SUPERVISOR APPROVAL	DATE
MS Monteith	3/10/83	[signature]	3/10/83

3 18 VERIFICATION PERFORMED BY DATE ☐SATISFACTORY ☐UNSATISFACTORY CAR NO.

19 QA CLOSURE - INITIATOR DATE REVIEW & APPROVAL DATE

20 CC LIST

H.A. WALKER (HL&P QA)
L.W. HURST (BEC QA)
J.W. ESTELLA (HL&P QA)

Attachment: HL&P Audit G08-301

HOUSTON LIGHTING & POWER
SOUTH TEXAS PROJECT ELECTRIC GENERATING STATION

QUALITY ASSURANCE
DEFICIENCY NOTICE

1 DN NO. 016
2 REV. 0

3 ORGANIZATION	4 DATE ISSUED	5 DATE DUE
Ebasco Quality Control	2/25/83	3/18/83

6 DOCUMENT VIOLATED	7 REVISION	8 PARA.
QCP-6.3 "QC Review of Incoming Revisions/ Changes to Bechtel Specifications and Procedures"	0	5.2

9 DESCRIPTION OF DEFICIENCY

1 QCP-6.3, Paragraph 5.2, states in part the "the assigned QC Engineer shall use the log for QC Review of Bechtel Specification/Procedure Revisions (Attachment A) . . .".

Contrary to this requirement, the log presently being used by QC is not the same log as depicted on Attachment A of the procedure.

10 INITIATOR	DATE
M S Monteith	2/23/83
11 REVIEW & APPROVAL	**DATE**
[signature] [signature] 2/24/83	2/23/83
12 PERSON CONTACTED F. E. WILLIAMSON — **POSITION** ESI LEAD QC ENGINEER-SITE	**DATE** 2/24/83

13 REMEDIAL ACTION

2 PCR #1 to QCP-6.3 was approved on 2-18-83, authorizing the use of the log format cited in this DN. The early use was dictated because during early stages of implementation of this procedure it was discovered the original log format just would not do the intended job.

14 SIGNATURE	DATE	15 EFFECTIVITY DATE
RP [signature]	3-10-83	3-10-83

3

16 RESPONSE ACCEPTANCE-INITIATOR	DATE	17 SUPERVISOR APPROVAL	DATE
MS Monteith	3/10/83	[signature]	3/10/83

18 VERIFICATION PERFORMED BY DATE: MS Monteith — ☒ SATISFACTORY ☐ UNSATISFACTORY — CAR NO. N/A

19 QA CLOSURE – INITIATOR	DATE	REVIEW & APPROVAL	DATE
MS Monteith	3/10/83	[signature]	3/10/83

20 CC LIST

H. A. WALKER (HL&P QA)
L. W. HURST (BEC QA)
J. W. ESTELLA (HL&P QA)

Attachment: HL&P Audit G08-301

HOUSTON LIGHTING & POWER
SOUTH TEXAS PROJECT ELECTRIC GENERATING STATION

QUALITY ASSURANCE
DEFICIENCY NOTICE

1 DN NO. 017
2 REV. 0

3 ORGANIZATION	4 DATE ISSUED	5 DATE DUE
Ebasco Quality Control	2-25-83	3/18/83
6 DOCUMENT VIOLATED	7 REVISION	8 PARA.
QCP 16.1	1	5.7.1

9 DESCRIPTION OF DEFICIENCY

1 QCP 16.1, Paragraph 5.7.1, states "The written response (to the audit, surveillance, or inspection) shall be reviewed and approved by the Quality Control Site Supervisor prior to transmittal. All written responses shall be transmitted under the signature of the QCSS." Contrary to this requirement, there was no objective evidence that the QCSS was transmitting the written response by formal transmittals. The responsibility for transmitting responses is with Ebasco QA as defined in QAI-006.

10 INITIATOR	DATE
MS Monteith	2/23/83
11 REVIEW & APPROVAL	DATE
[signature]	2/24/83

12 PERSON CONTACTED	POSITION	DATE
F.E. WILLIAMSON	ESI LEAD QC ENGINEER - SITE	2/24/83

13 REMEDIAL ACTION

2 QCP-16.1, REV 1, is presently being revised to read as follows:

"The written response shall be reviewed and approved by the Quality Control Site Supervisor prior to being forwarded to Ebasco QA for subsequent transmittal. All written responses shall be forwarded under the signature of the Quality Control Site Supervisor."

14 SIGNATURE	DATE	15 EFFECTIVITY DATE
R.P. [signature]	3-10-83	3-18-83

16 RESPONSE ACCEPTANCE-INITIATOR	DATE	17 SUPERVISOR APPROVAL	DATE
MS Monteith	3/10/83	[signature]	3/10/83

3 18 VERIFICATION PERFORMED BY DATE ☐ SATISFACTORY ☐ UNSATISFACTORY CAR NO.

19 QA CLOSURE - INITIATOR DATE REVIEW & APPROVAL DATE

20 CC LIST

H.A. WALKER (HL&P QA)
L.W. HURST (BEC QA)
J.W. ESTELLA (HL&P QA)

HOUSTON LIGHTING & POWER
SOUTH TEXAS PROJECT ELECTRIC GENERATING STATION

QUALITY ASSURANCE
DEFICIENCY NOTICE

1 DN NO. 018
2 REV. 0

3 ORGANIZATION	4 DATE ISSUED	5 DATE DUE
Ebasco Quality Control	2-25-83	3/18/83
6 DOCUMENT VIOLATED QCP-15.1, "Identification and Control of Discrepancies and Nonconformances"	7 REVISION 2	8 PARA. 5.2.2/5.2.3

9 DESCRIPTION OF DEFICIENCY

1 QCP-15.1, Paragraph 5.2.2 states in part, "The inspector shall submit the Deficiency Notice. . .to the responsible Lead Quality Control Engineer for his review and evaluation." Paragraph 5.2.3 states in part ". . .the Lead QC Engineer. . .shall record, sign and date his decision. . .on the DN. . ."

Contrary to the above requirements, Deficiency Notices (DN) #006-C, 008-C and 009-C were reviewed, evaluated, signed, and dated by an individual other that the Lead Quality Control Engineer.

10 INITIATOR	MS Monteith	DATE 2/24/83
11 REVIEW & APPROVAL	[signature]	DATE 2/24/83
12 PERSON CONTACTED F.E. WILLIAMSON	POSITION ESI LEAD QC ENGINEER-SITE	DATE 2/24/83

13 REMEDIAL ACTION

2

14 SIGNATURE	DATE	15 EFFECTIVITY DATE

3

16 RESPONSE ACCEPTANCE-INITIATOR	DATE	17 SUPERVISOR APPROVAL	DATE

18 VERIFICATION PERFORMED BY DATE ☐ SATISFACTORY ☐ UNSATISFACTORY CAR NO.

19 QA CLOSURE - INITIATOR DATE REVIEW & APPROVAL DATE

20 CC LIST

H.A. WALKER (HL&P QA)
L.W. HURST (BE&C QA)
J.W. ESTELLA (HL&P QA)

Attachment: HL&P Audit G08-301

HOUSTON LIGHTING & POWER
SOUTH TEXAS PROJECT ELECTRIC GENERATING STATION

QUALITY ASSURANCE
DEFICIENCY NOTICE

1 DN NO. 019
2 REV. 0

3 ORGANIZATION	4 DATE ISSUED	5 DATE DUE
Ebasco Quality Control	2-25-83	3/18/83
6 DOCUMENT VIOLATED	**7 REVISION**	**8 PARA.**
QCP-12.1 "Calibration of M&TE	1	5.9.5.1

9 DESCRIPTION OF DEFICIENCY

1 QCP-12.1, Paragraph 5.9.5.1, states "The original of the closed Deficient Controlled M&TE Evaluation Report shall be transmitted to the QA Records Vault and a copy retained in the M&TE history file.

Contrary to this requirement, copies of closed Deficient Controlled M&TE Evaluation Reports were not retained in all applicable M&TE history files.

10 INITIATOR	DATE
MS Monteith	2/24/83
11 REVIEW & APPROVAL	**DATE**
[illegible signature]	2/24/83
12 PERSON CONTACTED / POSITION	**DATE**
F.E. WILLIAMSON / ESI LEAD QC ENGINEER-SITE	2/24/83

13 REMEDIAL ACTION

2 QCP-12.1 shall be revised to delete this requirement as it serves no useful purpose.

14 SIGNATURE	DATE	15 EFFECTIVITY DATE
RP Grabowski	3-10-83	4-1-83

16 RESPONSE ACCEPTANCE–INITIATOR	DATE	17 SUPERVISOR APPROVAL	DATE
MS Monteith	3/10/83	[illegible signature]	3/10/83

3 18 VERIFICATION PERFORMED BY DATE ☐ SATISFACTORY ☐ UNSATISFACTORY CAR NO.

19 QA CLOSURE – INITIATOR DATE REVIEW & APPROVAL DATE

20 CC LIST

H.A. WALKER (HL+P QA)
L.W. HURST (BEC QA)
J.W. ESTELLA (HL+P QA)

Attachment: HL&P Audit G08-301

HOUSTON LIGHTING & POWER
SOUTH TEXAS PROJECT ELECTRIC GENERATING STATION

QUALITY ASSURANCE
DEFICIENCY NOTICE

1 DN NO. 020
2 REV. 0

3 ORGANIZATION	4 DATE ISSUED	5 DATE DUE
Ebasco Quality Assurance	02-24-83 ~~2-25-83~~	N/A
6 DOCUMENT VIOLATED	**7 REVISION**	**8 PARA.**
QAI-010 "Site QA Records"	2	6.1

9 DESCRIPTION OF DEFICIENCY

1 QAI-010, Paragraph 6.1 states in part, "All documents which are designated as Permanent in Section 5.1. . .shall be transmitted upon completion to the Ebasco Quality Records Supervisor for processing and transmittal to Bechtel Site Quality Assurance. . ."

Contrary to the above, transmittal and processing of records is governed by QAI-016 and turnover of completed packages to HL&P RMS and BEC is governed by QAI-019. Neither procedure is referenced by QAI-010 nor are they included in Section 6.1.

10 INITIATOR: MS Monteith	DATE: 2/24/83
11 REVIEW & APPROVAL: [signature]	DATE: 2/24/83
12 PERSON CONTACTED: R.A. Cummings Jr. — POSITION: ESI Site Quality Assurance Supervisor	DATE: 2/24/83

13 REMEDIAL ACTION

2 QAI-010 Revision 2 will be revised to indicate that documents which are designated as Permanent shall be ~~tr~~ RAC 2/24/83 processed and transmitted upon completion in accordance with QAI-016 and QAI-019 as applicable. QAI-016 Revision 0 is currently referenced in QAI-010 Revision 2. QAI-016 and QAI-019 will be included as reference documents in QAI-010 Revision 3. Anticipated date of Bechtel approval and corresponding issuance is April 8, 1983.

14 SIGNATURE	DATE	15 EFFECTIVITY DATE
R.A. Cummings Jr.	2-24-83	4-8-83

16 RESPONSE ACCEPTANCE–INITIATOR	DATE	17 SUPERVISOR APPROVAL	DATE
MS Monteith	2/24/83	[signature]	2/24/83

3 18 VERIFICATION PERFORMED BY DATE ☐ SATISFACTORY ☐ UNSATISFACTORY CAR NO.

19 QA CLOSURE – INITIATOR DATE REVIEW & APPROVAL DATE

20 CC LIST

H.H. Walker (HL&P QA)
L.W. Hurst (BEC QA)
R.A. Cummings (ESI QA)
J.W. Estella (HL&P QA)

Attachment: HL&P Audit G08-301

HOUSTON LIGHTING & POWER
SOUTH TEXAS PROJECT ELECTRIC GENERATING STATION

QUALITY ASSURANCE
DEFICIENCY NOTICE

1 DN NO. 021
2 REV. 0

3 ORGANIZATION	4 DATE ISSUED	5 DATE DUE
Ebasco Quality Assurance	2-24-83 ~~2-25-83~~	N/A
6 DOCUMENT VIOLATED	**7 REVISION**	**8 PARA.**
QAI-001 "Site QA Organization and Responsibilities"	1	4.4.2

9 DESCRIPTION OF DEFICIENCY

1 QAI-001, Paragraph 4.4.2 states that "The NCR Coordinator is responsible for submittal of records generated by the Site QA Group to the QA Records Coordinator."

Contrary to this statement, the NCR Coordinator is not performing this function.

10 INITIATOR M S Monteith — DATE 2/23/83

11 REVIEW & APPROVAL [signature] — DATE 2/24/83

12 PERSON CONTACTED R. A. CUMMINGS JR. — POSITION ESI QUALITY ASSURANCE SITE SUPERVISOR — DATE 2/24/83

13 REMEDIAL ACTION

2 The requirement has been deleted from the responsibilities of the NCR Coordinator in Revision 2 to QAI-001 which was submitted to Bechtel for final approval on 2-22-83. Anticipated date of issuance of Revision 2 to QAI-001 is 3-11-83.

14 SIGNATURE R.A. Cummings Jr. — DATE 2-24-83 — 15 EFFECTIVITY DATE 3-11-83

16 RESPONSE ACCEPTANCE—INITIATOR M S Monteith — DATE 2/24/83 — 17 SUPERVISOR APPROVAL [signature] — DATE 2/24/83

3 18 VERIFICATION PERFORMED BY M S Monteith — DATE 3/11/83 — ☒ SATISFACTORY ☐ UNSATISFACTORY — CAR NO. N/A

19 QA CLOSURE – INITIATOR M S Monteith — DATE 3/11/83 — REVIEW & APPROVAL [signature] — DATE 3/11/83

20 CC LIST

H. A. WALKER (HL&P QA)
L. W. HURST (BEC QA)
R.A. CUMMINGS (ESI QA)
J. W. ESTELLA (HL&P QA)

PQA-059 (10/82)

Attachment: HL&P Audit G08-301

HOUSTON LIGHTING & POWER
SOUTH TEXAS PROJECT ELECTRIC GENERATING STATION

QUALITY ASSURANCE
DEFICIENCY NOTICE

1 DN NO. 022
2 REV. 0

3 ORGANIZATION	4 DATE ISSUED	5 DATE DUE
Ebasco Quality Assurance	02-24-83	N/A
6 DOCUMENT VIOLATED "Personnel Indoctrination and ESI NQAPM, Section QA-I-3, Training Program in QA"	7 REVISION 2	8 PARA. 3.3

9 DESCRIPTION OF DEFICIENCY

1 ESI NQAPM, Section QA-I-3, Paragraph 3.3. states in summation that the "Quality Assurance Engineering Department shall maintain copies of training lessons on file."

Contrary to this requirement, there is no site implementing procedure which describes this responsibility. Copies of training lessons are kept on file in the QA Training Department.

10 INITIATOR	DATE
MS Monteith	2/23/83
11 REVIEW & APPROVAL	DATE
[signature] [signature] 2/24/83	2/23/83

12 PERSON CONTACTED	POSITION	DATE
R.A. CUMMINGS JR.	ESI SITE QUALITY ASSURANCE SUPERVISOR	2/24/83

13 REMEDIAL ACTION

2 Proposed QAI-018 Revision 0 (Draft) has been through the Bechtel review cycle and is expected to be submitted for Final Bechtel approval by 2-28-83. QAI-018 as proposed contains requirements for maintaining copies of lesson plans on File. Anticipated date of issuance of an approved QAI-018 Rev. 0 is 3-22-83.

14 SIGNATURE	DATE	15 EFFECTIVITY DATE
R.A Cummings Jr	2-24-83	3-22-83

16 RESPONSE ACCEPTANCE–INITIATOR	DATE	17 SUPERVISOR APPROVAL	DATE
MS Monteith	2/24/83	[signature]	2/24/83

3 18 VERIFICATION PERFORMED BY DATE ☐ SATISFACTORY ☐ UNSATISFACTORY CAR NO.

19 QA CLOSURE – INITIATOR DATE REVIEW & APPROVAL DATE

20 CC LIST

H.A. WALKER (HL&P QA)
L.W. HURST (BEC QA)
R.A. CUMMINGS (ESI QA)
J.W. ESTELLA (HL&P QA)

HOUSTON LIGHTING & POWER
SOUTH TEXAS PROJECT ELECTRIC GENERATING STATION

QUALITY ASSURANCE
DEFICIENCY NOTICE

1 DN NO. 028
2 REV. 0

3 ORGANIZATION	4 DATE ISSUED	5 DATE DUE
Ebasco Quality Assurance	03-02-83	N/A

6 DOCUMENT VIOLATED		7 REVISION	8 PARA.
QAI-004	"Issuance and Processing of Nonconformance Reports"	2	6.3.10.3

1 9 DESCRIPTION OF DEFICIENCY

QAI-004, Paragraph 6.3.10.3, states in part, "Upon request from the cognizant discipline Lead QC Engineer, the NCR Coordinator shall transmit the original NCR to QC for completion of Block 26. . ."

Contrary to this requirement, the ESI NCR Coordinator does not utilize a formal transmittal to transmit the original NCR to QC for completion of Block 26, (Acceptance of New Work/Rework/Repairs).

10 INITIATOR: MS Monteith — DATE: 3/1/83

11 REVIEW & APPROVAL: [signature] — DATE: 3/2/83

12 PERSON CONTACTED: R.A. Cummings Jr. — POSITION: ESI QA Site Supervisor — DATE: 3/2/83

2 13 REMEDIAL ACTION

As of 2-23-83, the NCR Coordinator has been utilizing a formal transmittal for the transmittal of original NCR's to Ebasco QC. The NCR Coordinator will continue to use formal transmittals for NCR originals to QC unless the requirement in the QAI-004 would be later changed, to indicate otherwise.

14 SIGNATURE: R.A. Cummings Jr. — DATE: 3-02-83 — 15 EFFECTIVITY DATE: 2-23-83

3 16 RESPONSE ACCEPTANCE—INITIATOR: MS Monteith * — DATE: 3/2/83 — 17 SUPERVISOR APPROVAL: [signature] — DATE: 3/2/83

18 VERIFICATION PERFORMED BY: MS Monteith — DATE: 3/9/83 — ☒ SATISFACTORY ☐ UNSATISFACTORY — CAR NO. N/A

19 QA CLOSURE – INITIATOR: MS Monteith — DATE: 3/9/83 — REVIEW & APPROVAL: [signature] — DATE: 3/15

20 CC LIST

H.A. Walker (HL&P QA)
L.W. Hurst (BEC QA)
J.W. Estella (HL&P QA)
R.A. Cummings (ESI QA)

* THIS DEFICIENCY WAS IDENTIFIED ON 2/23/83 DURING PERFORMANCE OF AUDIT G08-301. PRIOR TO 2/23/83 NCR COORDINATOR WAS FORWARDING NCR ORIGINAL TO QC.

DC- 4554

EBASCO SERVICES INCORPORATED
QUALITY ASSURANCE ENGINEERING
SITE AUDITING
CORRECTIVE ACTION REQUEST

NO. 1

SITE AUDIT NO. 83-01

PROJECT South Texas SUBJECT Control of Measuring and Test Eqpt. DATE Feb 8 198

RESPONSIBILITY ASSIGNED TO C Hawn

REPLY DUE DATE	0	3	1	8	8

STATEMENT OF REQUIREMENTS:

ETR-1001 Rev. 2 Introduction and Scope of Services
QCP-12.1 Rev. 1 Paragraph 5.2.1

FINDINGS:

ETR requires calibration service procurement to comply with QA-I-5. Actual practice is to procure off-site calibration services per ASP-3 and QAI-009. This practice does not require Ebasco Vendor Qualification required by QA-I-5 incorporated and applicable by the ETR introduction.

AUDITOR: Larry A. Bast

DISCUSSED WITH: Dick Cummings

The response is required from the authority designated at the top left corner of this form under the description "Responsibility Assigned To." The responsibility for follow-up and evaluation of corrective action is the responsibility of the Ebasco Site Quality Assurance Group unless this responsibility is reassigned in the "Follow-up Responsibility" below to the New York office.

CORRECTIVE ACTION RESPONSE:
a) Taken to correct findings
b) Scheduled date of completion
c) Action to prevent recurrence

a) ______

b) ______

c) ______

SIGNATURE ______ TITLE ______ DATE ______

CORRECTIVE ACTION RESPONSE EVALUATION	☐ Satisfactory ☐ Unsatisfactory* Evaluated by	Date ______
CORRECTIVE ACTION AUDIT	☐ Satisfactory ☐ Unsatisfactory* Auditor	Date ______

* Refer to attached Ebasco Form 1332-2 (QA)

FOLLOW-UP RESPONSIBILITY: ☐ Ebasco Site QA
☐ Ebasco NYO QA Engineer

FINDING CLOSED ______ SIGNATURE ______ TITLE ______ DATE

1357 (QA) 11-78

Dc - 4554

EBASCO SERVICES INCORPORATED
QUALITY ASSURANCE ENGINEERING
SITE AUDITING

CORRECTIVE ACTION REQUEST

NO. 2

SITE AUDIT NO. 83-01

PROJECT South Texas SUBJECT Control of Measuring and Test Equipment DATE Feb 8, 198?

RESPONSIBILITY ASSIGNED TO C Hawn

REPLY DUE DATE | 0 | 3 | 1 | 8 | 8 |

STATEMENT OF REQUIREMENTS:

Q.P-12.1 Paragraph 5.5.8: "The reason for change in calibration interval shall be recorded on the Calibration Record Card."

FINDINGS:

Calibration Record Cards ST-CC-2281 thru 2290 indicate a change in calibration interval but do not include a reason for the changes.

AUDITOR Larry A. Bost

DISCUSSED WITH Lonnel Wilhelm

The response is required from the authority designated at the top left corner of this form under the description "Responsibility Assigned To." The responsibility for follow-up and evaluation of corrective action is the responsibility of the Ebasco Site Quality Assurance Group unless this responsibility is reassigned in the "Follow-up Responsibility" below to the New York office.

CORRECTIVE ACTION RESPONSE:
a) Taken to correct findings
b) Scheduled date of completion
c) Action to prevent recurrence

a) ______

b) ______

c) ______

SIGNATURE ______ TITLE ______ DATE ______

CORRECTIVE ACTION RESPONSE EVALUATION
☐ Satisfactory
☐ Unsatisfactory* Evaluated by ______ Date ______

CORRECTIVE ACTION AUDIT
☐ Satisfactory
☐ Unsatisfactory* Auditor ______ Date ______

* Refer to attached Ebasco Form 1332-2 (QA)

FOLLOW-UP RESPONSIBILITY:
☐ Ebasco Site QA
☐ Ebasco NYO QA Engineer

FINDING CLOSED ______ ______ ______
SIGNATURE TITLE DATE

HL&P QA CORRECTIVE ACTION REPORT CONTINUATION

(1) CAR NO. C-224

(2) REVISION 0

Revision 1 require the basis of acceptance to be documented and authorized by responsible management when the required 4:1 accuracy ratio cannot be met.

H L & P 1008A (5-82)

Houston Lighting & Power Company

OFFICE MEMORANDUM

March 25, 1983

ST-HS-HS-01878
File No.: Q12.8
Q16.4

To Mr. J. W. Williams

From Mr. H. A. Walker H. A. Walker

Subject South Texas Project Electric Generating Station
Project Audit Report Number G19-301

Attached is the Project Audit Report for HL&P Construction, Audit Number G19-301, conducted on February 28 through March 2, 1983.

·Number of Items Reviewed:	60
·Number of Deficiencies:	4
·Number of Concerns:	0
·Number of CARs:	1
·Number of DNs:	2

There are no conditions identified which required any action in addition to a CAR or DN. If you have any comments or require additional information, please contact Mr. A. C. Von Nyvenheim at extension 2415.

HAW/JWE/BSN:lr
Attachment

cc: G. W. Oprea, Jr.
J. E. Geiger
D. G. Barker
R. J. Maroni
S. M. Dew
R. L. Ulrey
E. A. Turner
A. R. Beavers
J. G. Dewease
J. H. Goldberg
L. B. Horrigan
R. P. Murphy
A. C. Von Nyvenheim
Audit File G19-301
STP/RMS-SRC
Site Library

SOUTH TEXAS PROJECT AUDIT REPORT

AUDIT NUMBER: G19-301/HL&P Construction

AUDIT DATES: February 28 - March 2, 1983

AUDITED ORGANIZATION:

HL&P Construction
P.O. Box 308
Bay City, Texas 77414

AUDIT TEAM:

A. C. Von Nyvenheim Lead Auditor
C. L. Grover Auditor

A. Clark Von Nyvenheim 3-22-83
Lead Auditor Date

PERSONNEL CONTACTED:

		PRE-AUDIT	DURING AUDIT	POST-AUDIT
J. W. Williams	Site Manager		X	
I. P. Morrow	Construction Superintendent	X	X	
W. H. Moye	Construction Engineering Supervisor	X	X	X
D. L. Dujka	Lead Construction Engineer	X	X	X

OBJECTIVE OF THE AUDIT:

To verify the programmatic adequacy of HL&P construction activities and to verify the proper implementation of their procedures.

DEFICIENCIES:

1. Project Quality Assurance Plan, Section 1.0, assigns Quality Assurance related responsibilities to HL&P construction organization. ANSI N45.2-1971, Section 6, requires that quality related activities shall be prescribed by documented instructions, procedures, or any other type of written form.

   Contrary to the above, HL&P construction organization does not have documented instructions, procedures, or any other type of written form for determining compliance to the quality related responsibilities described in Project Quality Assurance Plan.

   HL&P CAR #G-231 issued.

2. HL&P Procedure PMP-02, Rev. 4, Paragraph 5.8 requires that procedures that have been cancelled, shall continue to be listed in the index, but shall be designated, "Cancelled".

   Contrary to the above, review of index for Project Site Procedures, Rev. 19, indicated that thePSP-01, 02, 05,06, and 09 were designated "Deleted" instead of "Cancelled".

   DN #031 issued.

   DN #031 was closed on March 8, 1983.

3. HL&P Procedure PSP-07, Rev. 3, Paragraph 5.4.3 requires that all field construction procedures, whether they are quality construction procedures or construction procedures be reviewed by HL&P construction and that HL&P construction sign-off is required on the Quality Construction Procedure.

   Contrary to the above, review of documentation revealed that HL&P construction was not reviewing or approving all the procedures mentioned above.

   DN #032 issued.

   DN #032 was closed on March 8, 1983.

EVALUATION/RECOMMENDATIONS:

Within the scope of the audit, except for the deficiencies identified, HL&P Construction is complying with the Quality Assurance Program. It is recommended that HL&P Construction reevaluate their present role in the Project and update their procedures.

ATTACHMENTS:

CAR #G-231,
DN #031, and
DN #032.

PQA-042 (9/82)

The Light company

SOUTH TEXAS PROJECT ELECTRIC GENERATING STATION
HOUSTON LIGHTING & POWER

QUALITY ASSURANCE
CORRECTIVE ACTION REPORT

(1) CAR No. G-231

(2) REVISION 0

1

(3) ORGANIZATION HL&P Construction	(4) DEF REQUIRED ☐ YES ☒ NO	(5) RESPONSE DUE DATE 04-06-83
(6) DOCUMENT VIOLATED Project Quality Assurance Plan	REV. 1, Section 1.0	PARA. See Continuation

(7) DESCRIPTION OF CONDITION ADVERSE TO QUALITY

See attached pages.

(8) REPORTED BY: A. Clark Van Vleck Jr. cy — DATE: 3-7-83

(9) REVIEW AND APPROVAL: D Grover for D.F. Bednarczyk. — DATE: 3/7/83

2

(10) REMEDIAL ACTION

(11) SIGNATURE — DATE: — (12) EFFECTIVE DATE:

3

(13) CAUSE OF CONDITION

(14) CORRECTIVE ACTION TO PREVENT RECURRENCE

(15) REVIEW AND APPROVAL — DATE: — (16) EFFECTIVE DATE:

4

(17) HL&P INITIATOR	☐ ACCEPT ☐ REJECT	SUPERVISOR	DATE:
(18) VERIFICATION PERFORMED BY.	☐ SAT ☐ UNSAT	SUPERVISOR	DATE:
(19) HL&P QA CLOSURE			DATE:

HL&P QA CORRECTIVE ACTION REPORT CONTINUATION

(1) CAR NO. G-231

(2) REVISION 0

BLOCK (7) DESCRIPTION OF CONDITION ADVERSE TO QUALITY

Section 1.0 of Project Quality Assurance Plan assigns Quality Assurance related responsibilities to HL&P's construction organization as stated below:

1) Paragraph 1.5.1.3 states in part, "The Site Manager:

   a) ensures that the prime contractor's management properly implements the dispositions to various nonconformances as determined by the engineering resolution."

   b) ensures that construction conforms to the plans, specifications and procedures that govern work activities."

   c) has the authority to "Stop Work" for cause in all activities relating to construction."

2) Paragraph 1.5.2.3 states in part, "The Construction Superintendent ensures work is accomplished in accordance with approved procedures. . ."

3) Paragraph 1.5.3.1 states in part, "The Area Construction Supervisor(s) is/are responsible for <u>surveillance</u> of the prime contrac-

HL&P QA CORRECTIVE ACTION REPORT CONTINUATION

(1) CAR NO. G-231

(2) REVISION 0

BLOCK (7) DESCRIPTION OF CONDITION ADVERSE TO QUALITY

tors' construction activities for the assigned areas of the project."

4) Paragraphs 1.5.3.3 and 1.5.5.3 state in part, "The Area Construction Supervisor(s) and Lead Construction Supervisor. . .ensure that construction planning includes requirements for inspection and testing."

ANSI N45.2-1971, Section 6, requires that quality related activities shall be prescribed by documented instructions, procedures, or any other type of written form.

However, to the contrary, HL&P Construction organization does not have documented instructions, procedures, or any other type of written form for determining compliance to the Quality Assurance related responsibilities stated under items 1) through 4) above.

HOUSTON LIGHTING & POWER
SOUTH TEXAS PROJECT ELECTRIC GENERATING STATION

QUALITY ASSURANCE
DEFICIENCY NOTICE

1 DN NO. 031
2 REV. 0

3 ORGANIZATION	4 DATE ISSUED	5 DATE DUE
HL&P Construction	03-08-83	4/7/83
6 DOCUMENT VIOLATED	**7 REVISION**	**8 PARA.**
HL&P Procedure PMP-02	4	5.8

9 DESCRIPTION OF DEFICIENCY

1 Paragraph 5.8 states in part, "Procedures that have been cancelled shall continue to be listed in the index, but shall be designated '(CANCELLED)'."

However to the contrary, review of index for Project Site Procedures, Rev. 19 indicates that the PSP-01, 02, 05, 06 and 09 were designated "deleted" instead of '(CANCELLED)'."

10 INITIATOR	DATE
A. Chuck Von Nymhe ac	3-7-83
11 REVIEW & APPROVAL	**DATE**
D Grover for D.F. Bednarczyk	3/8/83
12 PERSON CONTACTED POSITION	**DATE**

13 REMEDIAL ACTION

2 The index for Project Site Procedures has been revised to replace "deleted" with "Cancelled". See Rev. 20 of the index dated 3-4-83. We previously felt the word "deleted" was adequate to describe when a procedure was no longer in effect but agree that PMP-02 does require that "Cancelled" be used.

14 SIGNATURE	DATE	15 EFFECTIVITY DATE
W. H. Moye	3/8/83	3/4/83

16 RESPONSE ACCEPTANCE–INITIATOR	DATE	17 SUPERVISOR APPROVAL	DATE
3 A. Chuck Von Nymhe	3-8-83	D Grover for DF Bednarczyk	3/8/82

18 VERIFICATION PERFORMED BY DATE ☒ SATISFACTORY ☐ UNSATISFACTORY CAR NO.

A. Chuck Von Nymhe

19 QA CLOSURE – INITIATOR	DATE	REVIEW & APPROVAL	DATE
A. Chuck Von Nymhe	3-8-83	D Grover for DF Bednarczyk	3/8/83

20 CC LIST

H A Walker
JW Williams
W H Moye
JW Estella

HOUSTON LIGHTING & POWER
SOUTH TEXAS PROJECT ELECTRIC GENERATING STATION

QUALITY ASSURANCE
DEFICIENCY NOTICE

1 DN NO. 032
2 REV. 0

3 ORGANIZATION	4 DATE ISSUED	5 DATE DUE
HL&P Construction	3/8/83	4/7/83
6 DOCUMENT VIOLATED	7 REVISION	8 PARA.
HL&P Procedure PSP-07	3	5.4.3

9 DESCRIPTION OF DEFICIENCY

1 See Attached Sheet.

10 INITIATOR	DATE
A. Clark Von Nyhuis	3-7-83
11 REVIEW & APPROVAL	DATE
D Grovell for D.F. Bednarczyk	3/8/83
12 PERSON CONTACTED — POSITION	DATE

13 REMEDIAL ACTION

2 Project Site Procedure PSP-07 entitled "Construction Review of Documents" described HL&P Construction activities prior to changing Construction Manager/Constructor. PSP-07 has been cancelled with present requirements incorporated into PSP-08 (Rev.4, dated 2-22-83) entitled "Control of Construction Documents". Since the change of the Construction Manager/Constructor, construction documents have been reviewed in accordance with the Interface Agreement issued on May 7, 1982 by ST-HL-YB-652. The complexity of such a change as was undertaken when Brown and Root was replaced by Bechtel/Ebasco had an effect on the timeliness of the required change to PSP-07.

14 SIGNATURE	DATE	15 EFFECTIVITY DATE
W. H. Moye	3-8-83	2-22-83

3

16 RESPONSE ACCEPTANCE–INITIATOR	DATE	17 SUPERVISOR APPROVAL	DATE
A. Clark Von Nyhuis	3-8-83	D Grovell for D.F. Bednarczyk	3/8/83

18 VERIFICATION PERFORMED BY DATE: A. Clark Von Nyhuis — ☒ SATISFACTORY ☐ UNSATISFACTORY — CAR NO.

19 QA CLOSURE – INITIATOR	DATE	REVIEW & APPROVAL	DATE
A. Clark Von Nyhuis	3-8-83	D Grovell for D.F. Bednarczyk	3/8/83

20 CC LIST

H A Walker
J W Williams
W H Moye
J W Estella

HL&P QA DEFICIENCY NOTICE CONTINUATION

(1) DN NO. 032

(2) REVISION 0

BLOCK (9) DESCRIPTION OF DEFICIENCY

Paragraph 5.4.3 states in part, "All field construction procedures, whether they are Quality Construction procedures or construction procedures are reviewed by HL&P construction. HL&P Construction sign-off is only required on the Quality Construction Procedures. . ." HL&P Construction also approves those Advance Change Notices that involve changes to procedures which affect inspection, testing, codes, standards, special process or regulatory requirements or which affect the quality program.

However to the contrary, a review of documentation/procedures revealed that HL&P Construction is NOT reviewing or approving all procedures mentioned above.

Battelle
Pacific Northwest Laboratories

Project Number______________

Internal Distribution

Date March 30, 1983

[redacted]

To John Heidenreich

From Harold Harty

Subject

Enclosed is some background information on the South Texas project. Some is fairly recent data, some a bit old. I hope it helps you in your contacts with HP&L.

HH:nb

Ref. No.	Name of plant (year indicates when economic figs. valid)	Capital cost M$	Interest %	Amortisation	Load factor %	Fuel costs	Cap charges	Total gen-cost	CONTRACTORS Reactor system	Reactor vessel	Core	Fuel	Steam raising	Turbines	Civil works
260 US P	Diablo Canyon 2	290							West.	C-E	West.	West.	West.	West.	Atkinson
261 US P	North Anna 2 (1979)	492 (1.3.6)	109M$	30					West.	RDM	West.	West.	West.	West.	Stone & W.
UA P	W. B. McGuire 1(1980)	1 089(7)	410M$	25	70	5.73	17.52	23.25	West.	West.	West.	West.	West.	West.	Duke
US P	Sequoyah 1 (1980)	1 155	305	35	70	7	10.0	17.0	West.	West.	West.	West.	West.	West.	TVA
266 US P	Jos. M. Farley 2(1976)	492		30	85				West.	C-E	West.	West.	West.	West.	Daniel
267 US B	Edwin I. Hatch 2(1979)	518		30	78				GE	C-E	GE	GE		GE	Stand. Con.
269 US P	Watts Bar 1 (1980)	1 203	272M$	35	70	7.6	10.2	17.8	West.	West.	West.	West.	West.	West.	TVA
277 US B	Zimmer 1 (1980)	849(1)	219M$	33					GE	CB & I	GE	GE		West.	Kaiser
281 US B	La Salle 1			30	63	6.1			GE	C-E	GE	GE		GE	Walsh
282 US P	Salem 2	1 247(7)	890	30	75	0.48 MBTU			West.	C-E	West.	West.	West.	West.	UEC
289 US P	Sequoyah 2(1980)	1 155(1)	305	35	70	7	10.0	17.0	West.	West.	West.	West.	West.	West.	TVA
290 US B	WNP 2 (1980)	1 347	363M$	31	70	6.1	16.21	22.31	GE	CB & I	GE	GE	Cleaver B	West.	Bovee & Crail
291 US P	Bellefonte 1 (1980)	1 675	375M$	35	70	10.3	13.8	24.1	B & W	B & W	B & W	B & W	B & W	BBC	TVA
292 US P	Virgil C. Summer(1980)	827			80				West.	CB & I	West.	West.	West.	GE	Daniel
297 US F	FFTF (1979)	540							West. Bechtel	C-E	NNS West.	Numec Kerr			Bechtel
301 US B	Susquehanna 1 (1980)	1 615		30	70	8.5	34	42.5	GE	CB & I	GE CB & I	GE	Bechtel	GE	Bechtel
[redacted]															
312 US G	Fulton 2	1 158(7)							GA	GA	GA	GA	GA	West.	Stone & Web.
314 US P	Comanche Peak 1								West.	CF	West.	West.	West.	ACPSI	B&R
326 US B	Enrico Fermi 2 (1979)	988	226	30	70	12.1	25	37.1	GE	CE	GE	GE	GE	GEC	Daniel
327 US P	Byron 1								West.	B & W	West.	West.	West.	West.	Blount
329 US B	Grand Gulf 1(1976)	1 500(7.1)	7.5	40	80	4.2	11.2	15.4	GE	CB & I	GE	GE	GE	A-C	
330 US B	Perry 1 (1979)	2 552	779	40	70			21.8	GE	CB & I	GE	GE		GE	
333 US P	Braidwood 1								West.	B & W	West.	West.	West.	West.	G. K. Newberg
335 US P	Waterford 3 (1980)	1 229	21	35					C-E	C-E	C-E	C-E	C-E	West.	Ebasco
336 US P	Bellefonte (1979)	1 675	375M$	35	70	10.3	13.8	24.1	B & W	B & W	B & W	B & W	B & W	BBC	TVA
337 US P	Midland 2								B & W	B & W	B & W	B & W	GE	Bechtel	
338 PR P	Isolte						13.1								
341 US P	WPN 1 (1980)	1 580	473	34	70	7.68	19.17	26.85	B & W	B & W	B & W	B & W		GE	Atkinson WSH
343 US	Beaver Valley 2(1979)	550(25)	134	40	55	4.45			West.	C-E	West.	West.	West.	West.	Stone & Web.
344 US P	Catawba 1 (1980)	1 534(7)	534	25	70	5.73	24.42	31.95	West.	West.	West.	West.	West.	GE	DPC
345 US G	Summit 1	962(7)	(50)	30	75				GA	GA	GA	GA	GA	A-C	
346 US B	Clinton 1								GE	CB & I	GE	GE	Baldwin	GE	Baldwin
349 US B	Enrico Fermi 3	460	7.5	35	80	2	6.9		GE						
352 US P	Callaway 1								West.	C-E	West.	West.	West.	GE	
368 US B	Shoreham								GE	C-E	GE	GE	S & W	GE	Dravo
371 US P	W. B. McGuire 2(1980)	1 089	410M$	25	70	5.73	17.52	23.25	West.	West.	West.	West.	West.	West.	Duke
373 US P	Watts Bar 2 (1980)	1 203	272	35	70	7.6	10.2	17.8	West.	West.	West.	West.	West.	West.	TVA
375 US B	La Salle 2			30	63	6.1			GE	C-E	GE	GE		GE	Walsh
379 US B	Hartsville A1 (1979)	3 500(1)	770M$	35	70	10.7	13.1	23.8	GE	CB & I	GE	GE	GE	BBC	TVA
381 US P	Midland 1 (1977)								B & W	B & W	B & W	B & W	B & W	GE	Bechtel
382 US P	Palo Verdi 1								C-E	C-E	C-E/Avery	C-E	C-E	C-E	Bechtel
384 US B	Hope Creek 1 (1979)	2 265(3.7)		30					GE	GE	GE	GE	GE	GE	Bechtel
393 US B	Allens Creek 2								GE						
US P	Comanche Peak 2								West.	CE	West.	West.	West.	ACPSI	B&R
US P	South Texas 2	2 700(7)		40	77	12.12			West.	C-E	West.	West.	West.	West.	B&R
US P	Forked River 1								C-E	C-E	C-E	C-E	C-E	BBC	Burns & Roe
398 US P	Catawba 2 (1980)	1 534(7)	534	25	70	5.73	24.42	31.95	West.	West.	West.	West.	West.	GE	DPC
399 US P	Byron 2								West.	B & W	West.	West.	West.	West.	Blount
400 US P	Wolf Creek 1 (SNUPPS)								West.	C-E	West.	West.	West.	GE	
401 US B	Susquehanna 2 (1980)	1 085		30	70	8.5	34	42.5	GE&Bechtel	CB & I	GE/CB & I	GE	Bechtel	GE	Bechtel
407 US P	Mayport 1								OPS						
408 US P	WNP 3 Satsop(1980)	1 637	494M$	34	70	6.73	19.74	26.47	C-E	CE/Avery	C-E			West.	
409 US P	Braidwood 2	1 000							West.	B & W	West.	West.	West.	West.	G. K. Newberg
410 US P	Seabrook 1 (1980)	2 085	1 075	30	75	10	50	46.65	West.	C-E/West.	West.	West.		GE	Perini
411 US P	San Onofre 3 (1980)	1 160	13	30	70	13.9	38.6	52.5	C-E	C-E	C-E	C-E	C-E	GEC	Bechtel
414 US P	North Anna 3 (1979)	660	17M$						B & W	RDM	West.	West.	West.	West.	Stone & Web.
415 US B	Riverbend 1 (1980)	1 700	399						GE	GE	GE	GE		GE	Stone & Webb
416 US P	St. Lucie 2								C-E	C-E Avery	C-E	GE	C-E	West.	Ebasco
417 US B	Perry 2 (1977)	2 552	779	40	70			21.8	GE	CB & I	GE	GE		GE	
418 US B	Nine Mile Pt. 2														
419 US P	Mayport 2								OPS						
426 US P	Surry 3	728(1.2.3)							B & W	B & W	B & W	B & W	B & W	GE	
427 US B	Black Fox 1 (1980)	2 388(7)		30	70				GE	GE/RDM	GE/CB & I	GE		GE	
428 US P	Alvin W. Vogtle 1(1979)	1 611		30	78				West.	C-E	West.	West.	West.	GE	Walsh
429 US B	Limerick 1 (1980)	3 358(7)	1244	30	80	9	35	46	GE	GE/CBI	GE	GE	Bechtel	GE	Bechtel
431 US B	Hartsville B1	3 500(1)	770	35	70	10.7	13.1	23.8	GE	CB & I	GE	GE	GE	BBC	TVA
434 US B	Hartsville A2	3 500(1)	770	35	70	10.7	13.1	23.8	GE	CB & I	GE	GE	GE	BBC	TVA
435 US P	Seabrook 2 (1980)	1 825	785M$	20	60-80	10		50.55	West.	C-E	West.	West.		GE	Perini
441 US P	Marble Hill 1				65				West.	West	West.	West.	West.	West.	G. K. Newberg
443 US P	North Anna 4,(1979)	660(1.3.6)	170	30					B & W	RDM	West.	West.	West.	West.	Stone & Web.
444 US P	Shearon Harris 1(1979)	1 421	477M$	25					West.	CB & I	West.	West.	Ebasco	West.	Ebasco
445 US B	Bailly				76				GE	C-E	GE	GE		GE	
447 US P	Jamesport 1								West.	C-E	West.	West.	Stone & Web.	GE	
448 US F	Clinch River	1 950			75				West.	West.	West.	HEDL	GE	GE	Stone & Web.
449 US P	WNP4 Richland (1980)	1 512	602	33	70	9.96	26.21	36.17	B & W	B & W	B & W	B & W		West.	
451 US P	Surry 4	506(1.3.6)							B & W	B & W	B & W	B & W	B & W	GE	
453 US P	Marble Hill 2				65				West.	C-E	West.	West.	West.	West.	G. K. Newberg
454 US G	St. Rosalie 2								GA	GA	GA	GA	GA		UEC
455 US P	Alvin W. Vogtle 2 (79)	1 325		30	78				West.	C-E	West.	West.	West.	GE	Walsh
456 US B	Grand Gulf 2 (1976)	1 500(7.1)	7.5	40	80	5.1	11.2	16.3	GE	CB & I	GE	GE	GE	A-C	
457 US B	Hartsville B2 (1976)	3 500(1)	770	35	70	10.7	13.1	23.8	GE	CB & I	GE	GE	GE	BBC	TVA
458 US P	Palo Verdi 2								C-E	C-E	C-E/Avery	C-E	C-E	GE	Bechtel
460 US G	Phipps Bend 1 (1980)	2 200(7)	730	35	70	14.4	18.0	32.4	GE	CB & I	GE	GE	GE	BBC	TVA
461 US B	Phipps Bend 2 (1980)	2 200(7)	730	35	70	14.4	18.0	32.4	GE	CB & I	GE	GE	GE	BBC	TVA
463 US B	Skagit 1				75				GE/Bechtel	CB & I	CB & I	GE	GE	West.	
464 US P	Pilgrim 2								C-E	C-E	C-E	C-E		GE	Bechtel
465 US G	Fulton 1	1 158(7)	259						GA	GA	GA	GA	GA	West.	Stone & Web.
US P	Pebble Springs 1(1979)	1 208(1)	219	28	75	7.35	26.82	34.17	B & W	B & W	B & W	B & W	B & W	GE	
S P	Tyrone 1(SNUPPS)†	1 170							West.	West.	West.	West.	West.	GE	NSP
S B	Limerick 2 (1980)	3 358 (7)	1 244	30	80	9	35	46	GE	GE/CBI	GE	GE	Bechtel	GE	Bechtel
469 US P	Sundesert‡								West.	West.	West.	West. (9)	West.		
470 US P	Central Iowa†														
472 US B	Riverbend 2		7.5	28	70				GE	GE	GE	GE		GE	Stone & Web.

Ref. No.	Name of plant	Location	Reactor type and number	Output MW(e) gross net	Output MW(t)	Efficiency †	Date of regular power opn.	Owner	Operator	Main Contractor 'Turnkey	Architect-Engineer
260 US P	Diablo Canyon 2	San Luis Obispo	PWR 1	1156	3 568		80	PG & E	PG & E	PG & E	West
261 US P	North Anna 2	Mineral Va	PWR 1	947 898	2 775	32.7	79	VEP	VEP	Stone & Web	Stone & Web
262 US P	W.B. McGuire 1	Mt. Holly N.C.	PWR 1	1 220/1 180	3 411	34.6	80	DUKE	DUKE	West Duke	DUKE
263 US P	Sequoyah 1	Chattanooga, Ten	PWR 1	1 183/1 148	3 411	33	80	TVA	TVA	West	TVA
266 US P	Jos. M. Farley 2	Dothan, Ala	PWR 1	861 829	2 652	31	80	APC	APC	Daniel	SS Bechtel
267 US B	Edwin I. Hatch 2	Baxley Ga	BWR 1	852 825	2 436	32.7	79	GP	GP	GE SS	SS Bechtel
269 US P	Watts Bar 1	Spring City Tenn	PWR 1	1 218/1 177	3 411	33.5	81	TVA	TVA	West	TVA
277 US B	Zimmer 1	Moscow Ohio	BWR 1	840 810	2 436	33	81	CCD	CG & E	Kaiser	Sarg. & Lun
281 US B	La Salle County 1	Seneca Ill	BWR 1	1 122/1 078	3 293	33	10.79	ComEd	ComEd	ComEd	Sarg. & Lun
282 US P	Salem 2	Salem NJ	PWR 1	1 158/1 1:5	3 423	32.5	79	ACE/DPL/PEC &	PSEG	UEC	PSEG
289 US P	Sequoyah 2	Nr. Chattanooga Ten	PWR 1	1 183/1 140	3 411	33	81	TVA	TVA	West	TVA
290 US B	WNP 2 Richland	Richland Wash	BWR 1	1 150/1 100	3 323	33.1	81	WPPSS	WPPSS		Burns & Roe
291 US P	Bellefonte 1	Scottsboro Ala	PWR 1	1 263/1 213	3 600	34	83	TVA	TVA	B & W	TVA
292 US P	Virgil C. Summer 1	Jenkinsville S.C	PWR 1	950 900	2 775	33	80	SCE & G	SCE & G	Daniel	Gilbert
297 US F	FFTF	Richland Wash	FBR 1		400		80	DoE	West Han	West Han	Bechtel
301 US B	Susquehanna 1	Berwick Pa	BWR 1	1 100/1 050	3 293	31.6	82	PP & L	PP & L	Bechtel	Bechtel
304 US P	San Onofre 2	San Clemente, Ca	PWR 1	1 127/1 057	3 390	31	81	S.Ca.Ed/SDEG	S.CalEd	C-E/Bechtel	Bechtel
309 US P	South Texas 1	Wadsworth Tx	PWR 1	1 250	3817	33	84	HLP/CenPC/SAn	HLP	Brown & Root	Brown and Root
312 US G	Fulton 2†	Lancaster Pa	HTGR 1	1 200/1 160	3 000	39		Penn	Penn	GA	Stone & Web
314 US P	Comanche Peak 1	Glen Rose Texas	PWR 1	1 150/1 110	3 411	34	82	TUC	TUC	West	Gibbs & Hill
326 US B	Enrico Fermi 2	Monroe Mich	BWR 1	1 154/1 093	3 293	34.1	82	DE	DE	Daniel	DE
327 US P	Byron 1	Byron Ill	PWR 1	1 175/1 120	3 411	33	82	ComEd	ComEd	ComEd	Sarg. & Lun
329 US B	Grand Gulf 1	Port Gibson Miss	BWR 1	1 302/1 254	3 833	32.61	82	MSE	MP & L	GE	Bechtel
330 US B	Perry 1	Perry Ohio	BWR 1	1 252/1 205	3 579	33.6	83	CEIC	CEIC	CEIC	Gilbert
333 US P	Braidwood 1	Braidwood Ill	PWR 1	1 175/1 120	3 425	33	83	ComEd	ComEd	ComEd	Sarg. & Lun
335 US P	Waterford 3	Taft La	PWR 1	1 165/1 125	3 410	34	82	LPL	LPL	Ebasco	Ebasco
336 US P	Bellefonte 2	Scottsboro Ala	PWR 1	1 263/1 213	3 600	34	84	TVA	TVA	B & W	TVA
337 US P	Midland 2	Midland Mich	PWR 1	852/816	2 468	34.5	81	CPC	CPC	Bechtel	Bechtel
338 PR P	Isolte	Arecibo, Puerto Rico	PWR 1	583			81	PRWRA			
341 US P	WNP 1 Richland	Richland Wash	PWR 1	1 340/1 250	3 780	33.1	83	WPPSS	WPPSS		UEC
343 US P	Beaver Valley 2	Shippingport, Pa	PWR 1	891/852	2 652	31	86	(41)	Duquesne	West	Stone & Web
344 US P	Catawba 1	Clover S.C	PWR 1	1 205/1 145	3 411	33.6	83	Duke	Duke	Duke	Duke
345 US G	Summit 1†	Middletown Del	HTGR 1	781/770	2 000	39	†	Delmarva	Delmarva	GA	UEC
346 US B	Clinton 1	Clinton Ill	BWR 1	985/928	2 894	32.1	82	IPC	IPC	Baldwin	Sarg. & Lun
349 US B	Enrico Fermi 3	Monroe Mich	BWR 1	1 220/1 180	3 579	33	†	DE	DE	G-E	Ebasco
352 US P	Callaway 1(SNUPPS)	Fulton Mo	PWR 1	1 176/1 120	3 425		81	Union	Union	Daniel	Bechtel/S & P
368 US B	Shoreham 1	Shoreham NY	BWR 1	849/819	2 436	33.5	83	LILCO	LILCO		Stone & Web.
371 US P	W. B. McGuire 2	Mt. Holly N.C.	PWR 1	1 220/1 180	3 411	34.6	82	DUKE	DUKE	DUKE/West	DUKE
373 US P	Watts Bar 2	Spring City Tenn.	PWR 1	1 218/1 177	3 425	33.5	82	TVA	TVA	West	TVA
375 US B	La Salle County 2	Seneca Ill	BWR 1	1 122/1 078	3 293	33	81	ComEd	ComEd	ComEd	Sarg. & Lun
379 US B	Hartsville A1	Hartsville Tenn	BWR 1	1 269/1 233	3 579	33.5	86	TVA	TVA	GE	Stride
381 US P	Midland 1 (dual Purp.)	Midland, Mich	PWR 1	528/491	2 468	44.1	82	CPC	CPC	Bechtel	Bechtel
382 US P	Palo Verdi 1†	Wintersburg, Az	PWR 1	1 307/1 270	3 817		†	ANPP	APS		Bechtel
384 US B	Hope Creek 1	Salem N.J	BWR 1	1 118/1 067	3 293	33.4	84	PSEG	PSEG	Bechtel	Bechtel
393 US B	Allen's Creek 2†	Wallis Tex	BWR 1	1 200				HLP	HLP	Ebasco*	Ebasco
[redacted]											
397 US P	Forked River 1	Forked River NJ	PWR 1	1 123/1 070	3 410	33.4		JCPL	JCPL	Stearns-Roger	Burns & Roe
398 US P	Catawba 2	Clover S.C.	PWR 1	1 205/1 145	3 411	33.6	85	Duke	Duke	Duke	Duke
399 US P	Byron 2	Byron Ill	PWR 1	1 175/1 120	3 411	33	83	ComEd	ComEd	ComEd	S. & L.
400 US P	Wolf Creek 1 (SNUPPS)	Burlington Kan	PWR 1	1 188/1 150	3 425		82	KGE/KCPL	KGE	Daniel	Bechtel/S. & L.
401 US P	Susquehanna 2	Berwick Pa	BWR 1	1 100/1 050	3 293	31.6	83	PP & L	PP & L	Bechtel	Bechtel
407 US P	Mayport 1†	Mayport Fla	PWR 1	1 150			†	JEA	JEA	OPS	
408 US P	WNP 3 Satsop	Satsop Wash	PWR 1	1 316/1 240	3 800	32.6	84	WPPSS	WPPSS		Ebasco
409 US P	Braidwood 2	Braidwood, Ill	PWR 1	1 175/1 120	3 411	33	84	ComEd	ComEd	ComEd	S. & L.
410 US P	Seabrook 1	Seabrook NH	PWR 1	1 194/1 148	3 411	33.5	83	PSNH	PSNH	UEC	UEC
411 US P	San Onofre 3†	San Clemente, Ca	PWR 1	1 127/1 057	3 410	31	82†	SCal Ed/SDEG	SCal Ed	CE/EE	Bechtel
414 US P	North Anna 3	Mineral, Va	PWR 1	950/907	2 631	33.9	86	VEP	VEP	S & W	Stone & Web.
415 US B	Riverbend 1	St. Francisville, La	BWR 1	992/934	2 898	32.2	84	GSU	GSU	S & W	Stone & Web.
416 US P	St. Lucie 2†	Ft. Pierce, Fla	PWR 1	842/777	. .	. .	†	FPL	FPL	Ebasco	Ebasco
417 US B	Perry 2	Perry, Ohio	BWR 1	1 252/1 205	3 579	33.6	85	CEIC	CEIC	CEIC	Gilbert
418 US B	Nine Mile Point 2	Osweso, NY	BWR 1	1 135	3 323	. .	82	NMPC	NMPC	GE	Stone & Web.
419 US P	Mayport 2†	Mayport, Fla	PWR 1	1 100	. .	. .	†	JEA	JEA	OPS	
426 US P	Surry 3†	Surry County, Va.	PWR 1	925/858	2 631	34	83	VEP	VEP	West.	Stone & Web.
427 US B	Black Fox 1	Inola, Oka.	BWR 1	1 225/1 155	3 579	34.2	85	PSCO	PSCO	PSCO	BV
428 US P	Alvin W. Vogtle 1	Waynesboro, Ga.	PWR 1	1 210/1 164	3 411	32.5	84	GP	GP	GP	Bechtel
429 US B	Limerick 1	Pottstown, Pa.	BWR 1	1 140/1 100	3 440	32	85	Penn	Penn	GE/Bechtel	Bechtel
431 US B	Hartsville B1	Hartsville, Tenn.	BWR 1	1 269/1 233	3 579	33.5	89	TVA	TVA	GE	Stride
434 US B	Hartsville A2	Hartsville Tenn.	BWR 1	1 269/1 233	3 579	33.5	87	TVA	TVA	GE	Stride
435 US P	Seabrook 2	Seabrook, NH	PWR 1	1 194/1 148	3 411	33.5	85	PSNH	PSNH	UEC	UEC
441 US P	Marble Hill 1	Painesville, Indiana	PWR 1	1 130 net	3 411	33	82	PSI	PSI	PSI	Sarge & Lun.
443 US P	North-Anna 4	Mineral, Va	PWR 1	950/907	2 631	33.9	87	VEP	VEP	Stone & W.	Stone & Web.
444 US P	Shearon Harris 1	Bonsai, N.C.	PWR 1	960/900	2 785	33	84	CP & L	CP & L	Daniel	Ebasco
445 US B	Baily	Baileytown, Ind.	BWR 1	684/644	1 931	33	87	NIPS	NIPS	GE	Sarg. & Lun.
447 US P	Jamesport 1	Jamesport, NY	PWR 1	1 229/1 169	3 425	12.8	88	Lilco	Lilco		Stone & Web.
448 US F	Clinch River	Oak Ridge, Ten.	FBR 1	380/350	975	39	83	DoE/TVA	TVA	West.	Burns & Roe
449 US P	WNP 4, Richland	Richland, Wash.	PWR 1	1 340/1 250	3 780	33.1	85	WPPSS	WPPSS	. .	UE & C
451 US P	Surry 4†	Surry County, Va.	PWR 1	925/858	2 631	34	†	VEP	VEP	West.	Stone & Web.
453 US P	Marble Hill 2	Painesville, Indiana	PWR 1	1 130 net	. .	. .	84	PSI	PSI	West.	Sarge & Lun.
454 US G	St. Rosalie 2†	Alliance, La.	HTGR 1	/1 240	. .	39	†	LP & L	LP & L	GA	UEC
455 US P	Alvin W. Vogtle 2	Waynesboro, Ga	PWR 1	1 210/1 164	3 411	32.5	87	GP	GP	GP	Bechtel
456 US B	Grand Gulf 2	Port Gibson, Miss.	BWR 1	1 302/1 250	3 833	32.61	85	MSE	MP & L	GE	Bechtel
457 US B	Hatsville B2	Hartsville, Tenn.	BWR 1	1 269/1 233	3 579	33.5	90	TVA	TVA	GE	Stride
458 US P	Palo Verdi 2†	Winterburg, Az.	PWR 1	1 307/1 270	3 817		†	ANPP	APS	Bechtel	Bechtel
460 US B	Phipps Bend 1	Surgoinsville, TN.	BWR 1	1 269/1 233	3 579	34	87	TVA	TVA	GE	TVA
461 US B	Phipps Bend 2	Surgoinsville, TN.	BWR 1	1 269/1 233	3 579	34	89	TVA	TVA	GE	TVA
463 US B	Skagit 1	Sedro Wooley, Wa.	BWR 1	1 335/1 288	3 800	33.9	. .	PSPL	PSPL	GE	Bechtel
464 US P	Pilgrim 2	Plymouth, Mass.	PWR 1	1 240/1 180	3 629	32.5	8.82	BosEd	BosEd	GE/Bechtel	Bechtel
465 US G	Fulton 1†	Lancaster, Pa.	HTGR 1	1 200/1 160	3 000	39	†	PEC	PEC	GA	Stone & Web
466 US P	Pebble Springs 1	Arlington, Or.	PWR 1	1 314/1 260	3 600	35	90	PGE/PPL	PGE	B & W/Bechtel	Bechtel
467 US P	Tyrone 1 (SNUPPS)†	Durand, Wis.	PWR	1 100	. .	33	†	NSP	NSP	West.	Bechtel
468 US B	Limerick 2	Pottstown, PA.	BWR 1	1 140/1 100	3 440	32	87	Penn	Penn	GE/Bechtel	Bechtel
469 US P	Sundesert†	Blythe, Cal.	PWR 2	978/934	2 785	. .	†	SDGE	SDGE	West	Stone & Web
470 US P	Central Iowa (Vandalia)†	Prairie City, Iowa	PWR	1 270	. .	. .	†	IPLC + Consortium	IPLC	B & W	
472 US B	Riverbend 2	St. Francisville, La	BWR 1	992/934	2 894	32.2		GSU	GSU	Stone & web	Stone & Web

29,000, Orange Field 2,000, Panorama 1,684, Patton Village 1,537, Pine Forest 3,300, Pinehurst 2,700, Port Arthur 66,121, Porter 10,203, Port Neches 15,858 Saratoga 1,302, Shenandoah 1,701, Shepherd 1,378, Silsbee 18,200, Somerville 1,860, Sour Lake 3,062, Stowell 1,810, Trinity 3,085, Vidor 20,287, Warren 1,836, West Orange 5,000, Willis 2,391, Winnie 3,810, Woodbranch 1,134, Woodlands 8,165, Woodville 6,808

LOUISIANA

Addis 3,248, Angola 3,632, Arnaudville 1,673, Baker 14,480, Baton Rouge 297,126, Brittany 1,025, Broussard 1,770, Brownsfield 11,957, Brusly 3,704, Carencro 2,302, Carlyss 2,300, Carville 1,280, Central 8,609, Chamberlin 1,184, Church Point 3,986, Clinton 2,802, Crescent 2,144, Delcambre 1,929, Denham Springs 14,502, Duplessis 2,025, Dutchtown 3,100, Duson 1,115, Elton 1,595, Erwinville 2,072, French Settlement 1,256, Galvez 2,000, Gonzales 17,600, Grand Coteau 1,301, Greenwell Springs 2,824, Hackberry 1,500, Hayes 1,500, Henderson 1,700, Iota 1,300, Iowa 2,100, Jackson 8,810, Jarreau 2,108, Jennings 11,793, Lake Arthur 3,551, Lake Charles 96,000, Lakeland 1,020, Livingston 3,140, Lobdell 3,000, Maringouin 3,135, Millerville 7,760, Mix 1,200, Morganza 1,500, Oak Grove 3,625, Oscar 1,120, Port Allen 10,850, Port Barre 2,133, Prairieville 1,500, St Amant 1,200, St Francisville 2,920, St Gabriel 1,575, Scotlandville 18,611, Scott 1,334, Sorrento 1,800, Starks 2,000, Sulphur 22,600, Sunset 1,675, Sunshine 1,220, Toomey 1,800, Ventress 2,365, Walker 5,004, Westlake 6,500, Youngsville 1,010, Zachary 7,798

HOUSTON LIGHTING AND POWER CO
P.O. Box 1700, Houston, Tex 77001
Tel: 228-9211, Area Code: 713

Pres & Ch Exec Officer .... D D Jordan
Exec VP .... G W Oprea Jr
Exec VP .... H R Dean
Exec VP .... D D Sykora
Group VP, Adm .... J D Cowart
Group VP .... K R Hinckley
Group VP, Sys Eng & Opr .... D E Simmons
Group VP, Fossil Plt Eng & Constr .... E A Turner
VP, Pwr Sys Dev .... R M Mc Cuistion
VP .... C L McNeese
VP, Pwr Supply .... R L Evans Jr
VP, Pur & Svc .... A R Beavers
Sec & Treas .... J R Johnston
Compt .... R S Letbetter

Galveston Dist
Dist Mgr .... D G Gartman

Brazosport Dist
Dist Mgr .... J W Taylor

Baytown Dist/Channelview Dist
Dist Mgr .... J F Schaefer

Humble Dist
Dist Mgr .... K S McDonald

Bayshore Dist
Dist Mgr .... J L Wyatt

Pasadena Dist
Dist Mgr .... A C Czigan

Ft. Bend Dist
Dist Mgr .... F Davenport

Sealy Dist
Dist Mgr .... R C Fiedler

Wharton Dist
Dist Mgr .... J M Billings

Brazoria Dist
Dist Mgr .... E G Grisham

Tomball Dist
Dist Mgr .... J B Fuerst

Bellaire Dist
Dist Mgr .... J A Lopez

Mag Park-Undr Dist
Dist Mgr .... L Gardner

Berry Dist
Dist Mgr .... L Gardner

Hiram Clarke Dist
Dist Mgr .... Martha Medina

Greenspoint Dist
Dist Mgr .... W L Ullrich

Spring Br-Katy Dist
Dist Mgr .... R E White

Elec Cust: Res 909,016 Com 124,298 Indl 1,633 Others 76 Total 1,035,023
Elec Res Cust Avg Rate 05.0¢/kwhr, Use 14,219 kwhr
Tot No/Employees (Full Time,Year End) 8,768

MAJOR INTERCONNECTIONS

Utility	Max Tie Kva	Tie Voltages
Lwr Colo Riv Auth	200,000	138 kv
Texas P&L Co	1,200,000	345 kv
Central P&L Co	600,000	69,138 & 345 kv

1980 Net Sys Input 57,228,126,000 kwhr
1980 Power Purchased 720,293,000 kwhr
1980 Sales/Elec 54,803,619,214 kwhr
No/Transm Substa 26, Tot kva 28,680,859
No/Distr Substa 160, Tot kva 16,538,375
Transm Volt 138 kv & 345 kv, Pole Miles 1,833
Transm Volt 69 kv, Pole Miles 506
Distr-Prim Volt 34.5, 12.47, 7.2, 4.16, 2.4, St Ltg & Sec kv Pole Miles 17,596
Underground Cable Miles Transm 12.6, Prim & Secondary Distr 1,789, St Ltg 1,515
Tot Gen Cap as of Jan 1, 1981 11,607,502 kw
Sys Peak (Summer) 10,535,000 kw, (Winter) 7,357,000 kw

DEEPWATER, Houston Tex
Plant Supt .... G L Slenina
Net Sta Gen (1980) .... 573,496,000 kwhr
Steam Turbine Gen Cap .... 305,125 kw
Natural Gas
Unit 1 - 20,000 kw | Unit 5 - 12,000 kw
Unit 2 - 20,000 kw | Unit 6 - 35,000 kw
Unit 3 - 25,000 kw | Unit 7 - 156,250 kw
Unit 4 - 35,000 kw | Unit 8 - 1,875 kw

GABLE STREET, Houston Tex
Plant Supt .... C L Lloyd
Net Sta Gen (1980) .... (2,335,000) kwhr
Steam Turbine Gen Cap .... 53,000 kw
Natural Gas
Unit 6 - 20,000 kw | Unit 7 - 33,000 kw

DEEPWATER-CHAMPION, Houston, Tex
Net Sta Gen (1980) .... 192,907,000 kwhr
Steam Turbine Gen Cap .... 19,000 kw
Natural Gas
Unit 1 - 5,000 kw | Unit 3 - 10,000 kw
Unit 2 - 4,000 kw

HIRAM O. CLARKE, Houston, Texas
Plant Supt .... C L Lloyd
Net Sta Gen (1980) .... 251,720,000 kwhr
Steam Turbine Gen Cap .... 210,000 kw
Gas Turbine Gen Cap .... 81,000 kw
Natural Gas
Units 1-2 - 30,000 kw ea | Units 3-4 - 75,000 kw ea
Gas Turbine
Units 1-6 - 13,500 kw ea

GREENS BAYOU, Houston, Texas
Plant Supt .... A G Wortham
Net Sta Gen (1980) .... 2,604,372,000 kwhr
Steam Turbine Gen Cap .... 740,710 kw
Gas Turbine Gen Cap .... 362,340 kw
Natural Gas
Units 1-2 - 66,000 kw ea | Units 3-4 - 100,000 kw ea
Unit 5 - 408,710 kw
Gas Turbine
6 Units - 60,390 kw ea

CEDAR BAYOU, Baytown, Tex
Plant Supt .... M C Morris
Net Sta Gen (1980) .... 13,073,113,000 kwhr
Steam Turbine Gen Cap .... 2,093,800 kw
Natural Gas
Unit 1 - 692,737 kw | Unit 2 - 698,112 kw*
Unit 3 - 702,951 kw

WEBSTER, Webster, Tex
Plant Supt .... H Weiss
Net Sta Gen (1980) .... 2,185,460,000 kwhr
Steam Turbine Gen Cap .... 550,000 kw
Gas Turbine Gen Cap .... 14,500 kw (1 Unit)
Natural Gas
Units 1-2 - 100,000 kw ea | Unit 3 - 350,000 kw

SAM BERTRON, Houston, Tex
Plant Supt .... D A Buell
Net Sta Gen (1980) .... 3,425,751,000 kwhr
Steam Turbine Gen Cap .... 750,500 kw
Gas Turbine Gen Cap .... 41,500 kw
Natural Gas
Units 1-2 - 156,250 kw ea | Units 3-4 - 219,000 kw ea
Gas Turbine
Unit 1 - 27,000 kw | Unit 2 - 14,500 kw

T H WHARTON, Houston, Tex
Plant Supt .... T E Gish
Net Sta Gen (1980) .... 5,510,253,000 kwhr
Steam Turbine Gen Cap .... 505,964 kw
Gas Turbine Gen Cap .... 731,200 kw
Natural Gas
Unit 1 - 66,000 kw | Unit 2 - 220,000 kw
Unit 3 - 109,982 kw | Unit 4 - 109,982 kw
Gas Turbine
Unit G1 - 14,500 kw | Units 41-42 - 46,100 kw ea
Unit 31 - 46,100 kw | Units 43-44 - 50,400 kw ea
Units 32-34 - 45,200 kw ea | Units 51-56 - 57,000 kw ea

W A PARISH, Richmond, Tex
Plant Supt .... J H McConnell
Net Sta Gen (1980) .... 16,218,253,000 kwhr
Steam Turbine Gen Cap .... 2,942,169 kw
Gas Turbine Gen Cap .... 14,500 kw (1 Unit)
Natural Gas
Units 1-2 - 156,250 kw ea | Units 5-6 - 636,061 kw ea
Unit 3 - 275,000 kw | Unit 7 - 551,149 kw
Unit 4 - 531,398 kw

P. H. ROBINSON, Bacliff, Tex
Plant Supt .... C E Miller
Net Sta Gen (1980) .... 13,195,136,000 kwhr
Steam Turbine Gen Cap .... 2,177,694 kw
Gas Turbine Gen Cap .... 14,500 kw (1 Unit)
Natural Gas
Unit 1 - 477,000 kw | Unit 3 - 530,930 kw
Unit 2 - 477,000 kw | Unit 4 - 692,764 kw

TOWNS SERVED AND POPULATION

Alief 3,367, Alta Loma 2,317, Bacliff 2,723, Barrett 3,919, Baytown 56,650, Bellaire 14,936, Boling 1,081, Brookshire 2,138, Brookside 1,432, Bunker Hill 3,742, Cedar Bayou 1,379, Channelview 17,464, Clear Lake City 25,364, Cloverleaf 2,930, Clute 9,536, Crosby 1,599, Danbury 1,347, Deer Park 22,550, East Bernard 2,768, El Lago 3,112, Freeport 13,241, Galena Park 9,837, Galveston 61,601, Gulf Park 1,295, Hedwig Village 2,518, Highlands 4,749, Hitchcock 6,311, Houston 1,554,992, Humble 6,652, Hunters Creek 4,210, Jacinto City 8,921, Jersey Village 4,098, Jones Creek 2,602, Katy 5,677, Kemah 1,295, Lake Barbara 14,111, Lake Jackson 19,101, Lakewood 2,797, La Porte 13,862, Lomax 2,974, Manvel 3,467, McNair 2,998, Missouri City 25,323, Mont Belvieu 2,776, Nassau Bay 4,508, Needville 1,428, Oyster Creek 1,470, Pasadena 111,884, Pearland 13,130, Piney Point 2,942, Prairie View 3,601, Richmond 9,710, Richwood 2,582, Rosenberg 17,707, Santa Fe 7,254, Seabrook 4,647, Sealy 3,888, Sheldon 2,431, Shore Acres 1,237, So Houston 13,182, So Side Place 1,372, Spring 1,124, Spring Valley 3,355, Stafford 4,758, Sugarland 8,535, Taylor Lake 3,651, Tomball 3,973, Waller 1,237, Wallis 1,127, Webster 2,142, W Univ Place 11,973, Wharton 9,016

SOUTHWESTERN ELECTRIC POWER CO.
428 Travis St, P O Box 21106, Shreveport, La 71156
Tel: 222-2141, Area Code 318

See listing in Louisiana for pertinent information

SOUTHWESTERN ELECTRIC SERVICE CO.
1310 Mercantile Bank Bldg, Dallas, Tex 75201
Tel: 741-3125, Area Code: 214

Chmn. Board & Pres .... C D Goforth
VP & Treas .... D L Corley - Jacksonville, Tex
VP, & Gen Opr Mgr .... L D Long
VP, Engrg & Opr .... D C Fairbanks - Jacksonville, Tex
Sec .... G Hibbs
Supt. Sys Opr .... R A Perry - Jacksonville, Tex
Supv. Pur & Stores .... J D Spraggins - Jacksonville, Tex
Mgr Marketing Svc .... K D Van Cleave - Jacksonville, Tex
Mgr. Per & Insurance .... E W Hall - Jacksonville, Tex

HOUSTON INDUSTRIES INCORPORATED

CAPITAL STRUCTURE

LONG TERM DEBT

Issue	Rating	Amount Outstanding	[4]Times Charges Earned 1981	1980	Interest Dates	Call Price	Price Range 1981	1980
1. Houston Lighting & Power Co., conv. subord. deb. 5½s, due 1985	A2	[3]$37,820,000	2.04	3.11	F & A 1	[2]100.54	88½- 82⅛	88 - 77
2. Subsidiaries' debt	....	[5]1,890,139,000			....	.....	....	....

CAPITAL STOCK

Issue	Par Value	Amount Outstanding	Earned per Sh. 1981	1980	Divs. per Sh. 1981	1980	Call Price	Price Range 1981	1980
1. Common	No par	[1]68,861,000 shs.	[1]$3.14	[1]$3.14	[6]$2.24	$2.68	.....	[7]21¾- 16⅝	31⅝- 24⅝

[1]Based on avg. shs. as reported by Co.; adjusted for 3-for-2 split in May 1981. [2]Subject to change, see text. [3]Pursuant to the corporate restructuring plan in 1977, Co. assumed joint and several liability with Houston Lighting & Power Co. for payment of principal and interest on debs. issued by Houston Lighting & Power Co. [4]Times over-all charges (after income tax). [5]As of Dec. 31, 1981; excludes $40,000,000 subord. debt of Houston Lighting & Power Co. due parent. [6]Includes $0.74 paid prior to 3-for-2 split. [7]After 3-for-2 split; before, 29⅞-25.

HISTORY

Organized in Tex. in Oct. 1976 by Houston Lighting & Power Co. (Houston Lighting).

On Jan. 14, 1977, pursuant to a merger and corporate restructuring plan, Co. became the owner of all of the outstg. com. stock of Houston Lighting and two of its former subsidiaries, Primary Fuels, Inc. and Utility Fuels, Inc. In the merger and restructuring, each share of the outstg. com. stock of Houston Lighting became one share of Co. com. stock. In addition, Houston Lighting's outstg. convertible debentures became convertible into Co. com. stock.

BUSINESS

Co. is a holding company, which thru its principal subsidiary (Houston Lighting) is engaged in the generation, transmission, distribution and sale of electric energy, serving an area of the Texas Gulf Coast Region.

Thru other subsidiaries, Co. is engaged in oil and gas exploration and in the acquisition and delivery of fuels to electric generating plants. See "Properties" below.

PROPERTIES

Thru its subsidiary, Houston Lighting & Power Co., Co. owns and operates generating facilities with an aggregate nameplate capacity of 11,007,502 kilowatts. Primary Fuels, Inc. has a 50% interest in an oil and gas exploration venture that has leased approx. 67,000 offshore acres from the State of Texas. Venture also has a Federal lease of approx. 11,000 acres. Also, PFI has committed to a five-well program in the Anadarko Basin of Oklahoma with one company, a deep Ellenburger test in Pecos County, Texas, with a second firm, and participation with a third company in a lease acquisition and drilling program in an Abo gas prospect in eastern New Mexico. Additionally, PFI has decided not to continue participating in a joint exploration program with Shell Oil Company. Nevertheless, PFI will continue in 1982 with its participation in Shell-related exploratory wells drilling at year-end 1981, and in continuing development drilling of Shell-related discoveries already made.

Another subsidiary, Utility Fuels, Inc., was organized in 1973. It currently owns the railroad cars and coal handling equipment necessary to provide coal supply services to Houston Lighting & Power Company.

SUBSIDIARIES (wholly-owned)

Houston Lighting & Power Company
Primary Fuels, Inc.
Utility Fuels, Inc.
See appended statement.

LETTER TO SHAREHOLDERS

The following is the letter to shareholders of Don D. Jordan, President and Chief Executive Officer of Houston Industries Incorporated as it appeared in the Company's 1981 Annual Report:

TO OUR SHAREHOLDERS:

Nineteen eighty one was a year of mixed financial results for Houston Industries Incorporated. Net income increased 18 percent. Houston Lighting & Power Company's net income was up 22 percent. Primary Fuels, Inc. and Utility Fuels, Inc. posted losses; however, [illegible] the two subsidiaries to show an improved performance in 1982.

[illegible] experienced a net loss of $2.5 million [illegible] participation in a drilling program with Shell Oil Company. While the joint program [illegible] several promising discoveries, [illegible] development and production [illegible] Shell make determination of value [illegible] at this time. Primary Fuels will not participate in the Shell 1982 exploration program [illegible] will direct its resources toward [illegible] oil and gas prospects.

[illegible] posted a net loss of $5.2 million as a [illegible] million after tax write-down [illegible] in a uranium project. This [illegible] to reflect the current [illegible] uranium.

Dividend Increased Three Times

[illegible] dividend was increased twice [illegible] in January 1982 to [illegible] cents [illegible] annual rate of $2.16. This [illegible] the [illegible] increases. Since [illegible] at an average [illegible] of the electric [illegible] industry.

Changes Made at STP

At the South Texas Project we now have [illegible] with the capabilities needed to successfully complete this jointly-owned nuclear project.

Bechtel Power Corporation was named in September to replace Brown & Root as design engineer and construction manager of STP and in February 1982 Ebasco Services, Inc. was selected as the project's new constructor, subject to satisfactory contract negotiations.

The experience of Bechtel's personnel will enable design and engineering to progress more rapidly at STP. Ebasco is a highly experienced constructor that has engineered or built more than 40 nuclear facilities and 950 fossil and hydro units. Non-safety-related construction is scheduled to start up again by July, with safety-related work on STP targeted for September.

Allens Creek Being Re-evaluated

HL&P is re-evaluating its plans for its other nuclear project—the Allens Creek Nuclear Generating Station. The company has the option of completing Allens Creek as a nuclear plant or the use of the Allens Creek site for a coal plant. Considering the possibility that Allens Creek may not be built as a nuclear facility, HL&P is exploring the market possibilities for the sale of major items of equipment it has already bought or committed to purchase. The company is also considering its ability to obtain rate relief, so expenditures on Allens Creek might be amortized over an appropriate period of time. During the study period, expenditures associated with the project will be reduced to an absolute minimum.

Four Units Accelerated

Activity associated with both HL&P's nuclear projects has been considerably less than expected and as a result expenditures for these units are lower than earlier projected. This has allowed the company to accelerate the estimated operational dates of four lignite-fired generating units by one year.

Two units at the Limestone Electric Generating Station, on which the company broke ground in October, are now scheduled for completion in 1986 and 1987. Two more units at the Malakoff Electric Generating Station are now scheduled to be operational in 1988 and 1989. The announcement of the Malakoff site was made in December; site work will start in 1983.

Dividend Reinvestment Expected To Qualify

Another positive development for HL&P has been passage of the Economic Recovery Tax Act of 1981. One provision of the law permits shareholders who reinvest cash dividends in the common stock of utility companies to exclude from income up to $750 per year ($1,500 on joint returns) of the dividends, starting in 1982. We believe HI's Dividend Reinvestment Plan will qualify for this tax deferred treatment.

Load Management, Purchased Power Essential

Even though HL&P has one of the country's largest power plant construction programs, purchased power and load management will also be required to meet the service area's anticipated energy needs for the remainder of this decade.

In February 1982, HL&P signed a letter of intent with the Southern Company to purchase 500 megawatts of capacity a year from 1985 through 1992. The contract, when finalized, should help the company improve its reserve margin and provide HL&P with additional energy at competitive prices. The company will continue to buy power under contracts it has with City Public Service Board of San Antonio and the City of Austin. The company is presently negotiating with other utilities for purchased power.

Also in February, HL&P began a rebate program for customers who buy heat pumps or high efficiency air conditioners. Low interest weatherization loans are now also available to HL&P customers. These programs are designed to encourage conservation and reduce growth in demand for electricity which will benefit all customers.

HL&P is pursuing additional programs through load management and conservation to reduce peak electrical demand at least 1,200 megawatts by the end of this decade. This would be the equivalent of deferring the construction of two coal fired units the size of Unit 8 being built at the company's W.A. Parish plant.

Progress Made in Washington

In our nation's capital, we were successful in our efforts to amend legislation that would have forced the company to stop using natural gas as a boiler fuel by the end of 1989. Still, uncertainties regarding the availability and price of natural gas dictate that we reduce our dependence on gas with all due speed.

Management Changes Made

In order to continue strong continuity in management, a number of major organizational changes were made in 1981. Four HL&P executives were promoted to vice president and another vice president formerly with the Tennessee Valley Authority was added to head our nuclear operations staff. Primary Fuels selected a president to head its operations and added four vice presidents, including one to run PFI's newly-created Western District in Denver.

Houston Lighting & Power celebrates its 100th anniversary this year. While we reflect on our first 100 years of operation, we continue to plan and look forward to our next century of service. Reaching this milestone provides both an opportunity and a compelling reason to rededicate ourselves to the concepts that have made our company great.

As we embark on this second century we ask for your support to help us make our next 100 years even better than the first.

Don D. Jordan
President and Chief Executive Officer

Houston, Texas
March 22, 1982

MANAGEMENT

Officers

D.D. Jordan, Pres. & Chief Exec. Off.
G.W. Oprea, Jr., Vice-Pres.
D.D. Sykora, Vice-Pres.
H.R. Dean, Vice-Pres. & Treas.
J.R. Johnston, Sec. & Asst. Treas.
J.S. Brian, Asst. Sec. & Asst. Treas.
Wm. R. Brown, Gen. Counsel

Directors

(Showing Age & Principal Corporate Affiliations)

Searcy Bracewell (64), Member of the Houston law firm of Bracewell & Patterson.

William R. Brown (67), General Counsel of Co. and Member of the Houston law firm of Baker & Botts.

H.R. Dean (56), Vice-Pres. and Treas., Co.; Exec. Vice-Pres., Houston Lighting & Power Co.

John C. Echols (49), Chmn. of Bd. and Chief Exec. Off., Citizens Bank and Trust Co.

Howard W. Horne (55), Chairman of the Board, The Horne Co.; Director, Allied Bank of Houston.

D.D. Jordan (49), Chairman of the Board and Chief Exec. Off., Houston Lighting & Power Co. and President and Chief Exec. Officer Co.; Dir., Hughes Tool Co.; Dir., Texas Commerce Bancshares, Inc.

Thomas B. McDade (58), Vice-Chmn. of Bd., Texas Commerce Bancshares.

G.W. Oprea, Jr. (55), Vice-Pres., Co.; Exec. Vice-Pres., Houston Lighting & Power Co.

Stewart Orton (66), Executive Vice President, Federated Department Stores, Inc. Foundation; Dir., Bank of the Southwest, N.A.

Donald D. Sykora (51), President and Chief Operating Officer, Houston Lighting & Power Co.

Willard E. Walbridge (60), Consultant to Capital Cities Communications, Inc.; Director, International Systems and Controls Corporation.

Joe C. Wessendorff (61), Rancher and private investor.

Auditors: Deloitte Haskins & Sells.

Counsel: Baker & Botts.

Shareholder Relations: J.R. Johnston, Sec. & Asst. Treas. Tel.: (713)229-7247.

Director Meetings: First Wed. of Jan., Apr., July and Oct.

Annual Meeting: Second Wed. in May.

No. of Stockholders: Feb. 16, 1982, [illegible].

No. of Employees: Dec. 31, 1981, [illegible].

Executive Office: Electric Tower, Houston, TX 77002. Tel.: (713)228-[illegible].

Mailing Address: 611 Walker, P.O. Box 4505, Houston, TX 77210.

INCOME ACCOUNTS

COMPARATIVE CONSOLIDATED INCOME ACCOUNT, YEARS ENDED DEC. 31
(in thousands of dollars)

	1981	1980	1979	1978	1977
Revenues:					
Electric	2,769,215	2,123,957	1,707,572	1,303,604	1,069,786
Fuel sales	279,119	202,953	105,686	20,823	6,305
Oil and gas	46,997	40,354	40,901	25,011	19,470
Total	3,095,331	2,367,264	1,854,159	1,349,438	1,095,561
Expenses:					
Electric:					
Fuel	1,578,531	1,206,872	958,112	682,261	517,870
Oper. and maint.	479,280	331,060	256,693	196,942	159,093
Other taxes	90,327	80,856	69,968	60,172	51,435
Cost of fuel sold	246,898	180,373	82,170	15,489	6,319
Oil and gas oper. exp.	10,793	8,883	6,755	5,449	3,960
Depr., depl. and amort.	156,181	129,483	109,445	81,010	69,073
Total	2,562,010	1,937,527	1,483,143	1,041,323	807,750
Operating Income	533,321	429,737	371,016	308,115	287,811
Other Income:					
Allow. for funds used during constr.	39,058	32,735	31,928	17,029	14,088
Other—net	[1](19,089)	3,057	(3,792)	2,689	611
Total	19,969	35,792	28,136	19,718	14,699
Fixed Charges:					
Interest on long-term debt	154,697	129,139	107,447	87,140	71,888
Other interest	30,107	16,566	11,992	7,566	3,393
Allow. for borrow. funds used during constr.	(23,907)	(18,302)	(20,205)	(11,639)	(9,821)
Preferred div. of sub.	20,042	20,042	19,765	17,330	13,711
Total	180,939	147,445	118,999	100,397	79,171
Inc. Before Federal Inc. Taxes	372,351	318,084	280,153	227,436	223,339
Federal Income Taxes:					
Current	21,367	10,466	5,925	(3,074)	13,211
Deferred:					
Liberalized deprec.	40,081	39,507	32,316	34,511	27,367
Invest. tax credit	60,049	43,685	57,758	50,833	47,635
Oil & gas	16,574	11,286	6,014	7,117	(2,310)
Other—net	17,925	29,159	16,294	9,392	11,800
Total	155,996	134,103	118,307	98,779	97,703
Net Income	216,355	183,981	161,846	128,657	125,636
Retained earnings beg. of period	731,406	652,573	569,364	505,165	432,165
Common stock divs.	137,289	105,148	78,637	64,458	52,636
Retained earnings end of period	810,472	731,406	652,573	569,364	505,165

HL&P accrues AFUDC, net of federal income taxes, on construction projects and nuclear fuel payments except for amounts included in the rate base by regulatory authorities. During 1979, 1980 and 1981 the accrual rates were 7½%, 8⅓% and 9¼%, respectively. The borrowed funds component of AFUDC, before federal income taxes, is reflected in the statements of consolidated income as a credit to fixed charges and the other funds component is shown as other income.

[1] Includes a $20,063,000 write-down of investment in uranium project.

Statements of Changes in Consolidated Financial Position, years ended Dec. 31 (in $000):

	1981	1980
Source of funds:		
Operations:		
Net income	216,355	183,981
Depr., depl. and amort.	163,016	134,009
Def. fed. inc. taxes—net	74,580	79,952
Invest. tax credit def.—net	52,644	43,685
Allow. for funds used during constr.	(62,964)	(51,037)
Write-down of inv. in uranium proj.	20,063	......
Total	463,694	390,590
Com. stock. dividends	(137,289)	(105,148)
Reinvest. funds from oper.	326,405	285,442
Financing and other:		
Sale of com. stk.	173,502	175,272
Funds rec. from poll. contr. rev. bond proc. held by trust	96,260	5,000
Sale of first mortg. bonds	125,000	100,000
Sale of secur. notes	64,542	31,552
Chge. in notes pay. & temp. inv.	45,423	88,015
Recl. to curr. mat. of lg.-tm. debt	(8,886)	(29,605)
Decr. (incr.) in work. cap.	(22,319)	73,180
Other—net	(18,555)	2,962
Total	781,372	731,818
Application of funds:		
Constr. and nuclear fuel expend. and lignite adv. (net)	698,744	664,843
Oil, gas, and mining expend.	82,628	66,975
Total	781,372	731,818

BALANCE SHEETS

COMPARATIVE CONSOLIDATED BALANCE SHEET, YEARS ENDED DEC. 31
(in thousands of dollars)

	1981	1980	1979	1978	1977
ASSETS					
[illegible] plant	5,392,633	4,667,329	3,979,127	3,119,549	2,940,811
[illegible] plant acq. adjustments	3,166	3,166	3,166	3,166	3,166
[illegible] mining property	233,928	196,364	129,226	89,348	57,245
Total	5,629,727	4,866,859	4,111,519	3,212,063	3,001,242
Accumulated deprec., depl. and amort.	856,037	735,530	622,656	528,083	459,483
[illegible] plant and equip.—net	4,773,690	4,131,309	3,488,863	3,013,980	2,542,739
[illegible] Assets:					
[illegible]	11,360	13,027	[illegible]	10,606	12,203
[illegible] investments, at cost	600	2,000	42,129	69,064	
[illegible] and special deposits	9,132	5,182	[illegible]	4,630	3,081
[illegible] receivable:					
[illegible]	110,942	84,217	61,854	58,219	31,364
[illegible]	22,347	22,652	22,373	31,721	28,354
[illegible] average cost	80,968	66,364	47,833	49,362	51,305
[illegible] at cost	97,913	28,227	[illegible]	25,301	
[illegible] and supplies, at average cost	49,981	32,107	[illegible]	21,023	20,072
[illegible]	3,180	3,239	11,316	2,144	2,727
[illegible] current assets	386,925	252,295	[illegible]	275,418	[illegible]
[illegible]	70,158	49,334	44,164	25,961	[illegible]
[illegible]	5,230,773	4,433,938	[illegible]	[illegible]	[illegible]
[illegible]					
[illegible]	940,639	767,137	591,865	481,518	342,425
[illegible]	810,472	731,406	652,573	569,364	[illegible]
[illegible] equity	1,751,111	1,498,543	[illegible]	[illegible]	[illegible]
[illegible] preferred stock of subsidiary	244,358	244,358	[illegible]	213,933	[illegible]

BALANCE SHEETS (Cont'd):

	1981	1980	1979	1978
5¾% Conv. debentures due 1985	37,820	39,506	39,918	39,911
Long-term debt of subsidiaries	1,881,253	1,604,337	1,392,390	1,377,646
Total	3,913,702	3,385,904	3,025,264	2,658,464
Current Liabilities:				
Notes payable	170,523	126,500	88,614	56,397
Accounts payable	245,964	149,174	122,665	115,628
Taxes accrued	44,804	33,525	26,206	21,099
Interest accrued	42,588	31,110	29,305	28,191
Accrued liab. to municipalities	57,962	45,557	36,008	27,972
Dividends declared	5,010	5,010	5,010	4,112
Current portion of long-term debt	8,886	29,603	7,530	3,991
Other	25,625	23,147	16,471	17,114
Total current liabilities	601,362	443,628	331,809	275,063
Deferred Credits:				
Accum. def. federal income taxes	396,430	332,556	252,176	192,855
Unamort. investment tax credit	298,002	244,704	202,148	153,161
Other	13,157	17,761	14,931	26,779
Total def. credits	707,589	595,021	469,255	372,795
Property Insurance Reserve	8,120	8,385	8,369	8,500
Total liabilities	5,230,773	4,432,938	3,834,697	3,314,761
Net current assets	d214,437	d191,333	d30,138	355

(a) Less accumulated provision for uncollectible accounts.
(b) See footnote (c) under company only balance Sheet, above.
(c) Consisting of all preferred shares of Houston Lighting & Power Co.

Electric Plant, Dec. 31, 1981 ($000):

Production	1,931,310
Transmission	373,563
Distribution	1,022,589
General	230,379
Construction work in progress	1,526,434
Nuclear fuel in process	121,683
Coal handling equipment	166,675
Total	5,392,633

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

(As Taken From Annual Report of Company)

1. Summary of Significant Accounting Policies.

System of Accounts

The accounting records of Houston Lighting & Power Company (HL&P), the principal subsidiary, are maintained in accordance with the Federal Energy Regulatory Commission's Uniform System of Accounts which has been adopted by the Public Utility Commission of Texas (Utility Commission).

Principles of Consolidation

The consolidated financial statements include the accounts of the Company and its wholly-owned subsidiaries, HL&P, Primary Fuels, Inc. (PFI) and Utility Fuels, Inc. (UFI). Fuel sales and related cost of fuel sold generally represent UFI coal sales to HL&P and are not eliminated because of the distinction for regulatory purposes between utility and non-utility operations. All other significant intercompany transactions and balances are eliminated in consolidation.

Plant

Additions to electric plant, reduced by contributions in aid of construction, betterments to existing property and replacements of units of property are capitalized at cost. Cost includes the original cost of contracted services, direct labor and material, indirect charges for engineering supervision and similar overhead items and an allowance for funds used during constuction (AFUDC).

Maintenance of property and replacements and renewals of items determined to be less than units of property are charged to expense. The actual or average book costs of units of property replaced or renewed are removed from plant and such costs plus removal cost, less salvage, are charged to accumulated depreciation.

HL&P and UFI compute depreciation using the straight-line method. The depreciation provision as a percentage of the depreciable cost of plant was 3.7% for 1981 and 3.6% for 1980 and 1979.

Oil and Gas Property

The full-cost method of accounting is used for oil and gas operations. Accordingly, all costs of acquisition, exploration and development of properties are capitalized. Depreciation, depletion and amortization of these costs are determined on the unit-of-production method based on the estimated proved reserves of oil and gas properties. Depreciation, depletion and amortization amounted to $30,805,000, $20,895,000 and $11,350,000 ($2.37, $1.40 and $.62 per equivalent unit-of-production), for the years ended December 31, 1981, 1980 and 1979, respectively.

Allowance for Funds Used During Construction

HL&P accrues AFUDC, net of federal income taxes, on construction projects and nuclear fuel payments except for amounts included in the rate base by regulatory authorities. During 1979, 1980 and 1981 the accrual rates were 7½%, 8½% and 9⅓%, respectively. The borrowed funds component of AFUDC, before federal income taxes, is reflected in the Statements of Consolidated Income as a credit to fixed charges and the other funds component is shown as other income.

Revenues—Electric

Revenues are recognized from the sale of electricity as bills are rendered to customers. Rate schedules include fuel adjustment clauses which permit recovery of fuel expenses in the month incurred.

Federal Income Taxes

The Company follows a policy of comprehensive interperiod income tax allocation. Investment tax credits are deferred and amortized over the estimated lives of the related property.

Property Insurance Reserve

The cost of replacing uninsured plant losses of HL&P, less related tax effects, are charged against the reserve when incurred. Effective January 1980, additional accruals to the reserve have been denied by regulatory authorities.

Earnings Per Common Share

Earnings per common share are computed by dividing net income by the weighted average number of shares outstanding during the respective periods. Common stock equivalents outstanding during the periods did not have a material dilutive effect on earnings per share. Amounts shown for 1980 and 1979 have been restated to reflect a three-for-two stock split effective May 26, 1981.

2. Common Stock.

At the 1981 Annual Meeting, shareholders approved a resolution amending the Articles of Incorporation to increase the authorized common stock, without par value, from 75,000,000 to 125,000,000 shares. Common stock issued during 1981, 1980 and 1979 amounted to 9,932,388 shares, 10,038,350 shares and 7,294,778 shares, respectively, restated for the stock split.

3. Preferred Stock.

Any part or all of HL&P's preferred stock may be redeemed at the option of the Company at the following per share prices, plus any unpaid accrued dividends to date of redemption:

$4.00 Series—$105.00. $6.72 Series: through July 31, 1983—$103.51; thereafter—$102.51. $7.52 Series: through Oct. 31, 1982—$105.35; thereafter—$103.35 to $102.35. $9.52 Series: through Sept. 30, 1985—$109.52; thereafter—$105.00 to $101.00. $9.08 Series: through March 31, 1986—$105.00; thereafter—$103.00 to $101.00. $8.12 Series: through Nov. 30, 1982—$109.37; thereafter—$106.25 to $102.25. $9.04 Series: through Jan. 31, 1984—$109.04; thereafter—$105.00 to $101.00.

4. Long-Term Debt.

At Dec. 31, 1981, sinking or improvement fund requirements of HL&P's first mortgage bonds outstanding will be $29,950,000 for the year 1982, $30,950,000 for the years 1983 and 1984, $30,350,000 for the year 1985 and $29,750,000 for the year 1986. Of such requirements, $16,100,000 for the years 1982 through 1984, $15,800,000 for the year 1985 and $15,500,000 for the year 1986 may be satisfied by certification of property additions at 100% of the requirements and the remainder through certification of such property additions at 166⅔% of the requirements. Sinking or improvement fund requirements for 1981 and prior years have been satisfied by certification of property additions.

Annual maturities of long-term debt and minimum capital lease payments are approximately $12,327,000 in 1982, $68,587,000 in 1983, $77,162,000 in 1984, $106,817,000 in 1985 and $41,997,000 in 1986.

The issuable amount of HL&P first mortgage bonds is unlimited as to authorization, but limited by property, earnings, and other provisions of the mortgage and deed of trust and the supplemental indentures thereto. Substantially all properties of HL&P and UFI are subject to liens securing their long-term debt.

5. Short-Term Financing.

The interim financing requirements of the Company's operating subsidiaries are met through short-term bank loans and the issuance of commercial paper. HL&P, PFI and UFI have bank lines of credit aggregating $515,000,000 at year end 1981 (as compared with $410,000,000 in 1980) which limit their total short-term borrowings and provide for interest at rates generally less than the prime rate. Bank loans and commercial paper outstanding were $117,300,000 and $52,570,000 at Dec. 31, 1981 and $78,300,000 and $47,[illegible] at Dec. 31, 1980, respectively. Compensating balances are not required under these lines of credit, however, a commitment fee of [illegible] per annum is required on the undrawn portion of $75 million of the lines.

6. Retirement Plan.

The Company has a noncontributory retirement plan covering substantially all employees. The policy of the Company is to fund pension costs accrued, which includes amortization of prior service costs, over a period of thirty to forty years.

The total cost of the Company's retirement plan for each of the years 1981, 1980 and 1979 was $8,765,000, $7,563,000 and $6,223,000, respectively. The assumed rate of return on plan investments is 7%.

A comparison of accumulated plan benefits and plan net assets for the Company's retirement plan is presented below:

Actuarial present value of accumulated plan benefits:

	January 1, 1981	1980
Vested	$57,356,000	$49,2[illegible]
Nonvested	7,170,000	4,17[illegible]
	$64,526,000	$53,[illegible]
Market value of net assets available for plan benefits	$96,995,000	$57,[illegible]

7. Commitments and Contingencies.

Significant commitments have been incurred in connection with HL&P's construction program and for nuclear fuel purchases. The construction program (exclusive of AFUDC) is presently estimated to cost $[illegible] million in 1982, $1,119 million in 1983 and $1,256 million in 1984. An additional $85 million is expected to be spent for uranium concentrate and nuclear fuel processing services for HL&P's South Texas nuclear plant. Commitments in connection with HL&P's construction program, principally for generating plants and related facilities, are generally revocable by HL&P subject to reimbursement to manufacturers for expenditures incurred or other cancellation penalties. In addition, during the 1982-1984 period, UFI expects to spend $178 million for coal and lignite supply related equipment of which $29 million is expected to be spent in 1982, $51 million in 1983 and $98 million in 1984. PFI expects to spend approximately $78 million on oil and gas exploratory and development activities during 1982.

UFI has entered into financing arrangements for coal transportation equipment which are treated as capital leases for financial accounting purposes. The Company has no other material lease commitments.

8. Nuclear Project Re-evaluation.

HL&P recently began a re-evaluation of its proposed 1,200-megawatt Allens Creek nuclear project as a result of continuing uncertainties in construction schedules and cost estimates caused by inflation, regulatory delays and changing regulatory requirements. Among the matters being considered in the re-evaluation of the Allens Creek project are completion of the nuclear generating station as presently designed, use of the plant site for a coal-fired generating station, the availability of prospective purchasers of the major items of equipment which HL&P has already purchased or committed to purchase and the ability of HL&P to recover the Allens Creek expenditures through rates over an appropriate period. It is anticipated that a final decision respecting the future of the Allens Creek project will be made by the end of 1982. Until such decision is made, expenditures in [illegible]

[illegible] the project will be kept as low as possible.

[illegible] of Dec. 31, 1981, approximately $388 million had been spent or accrued on the Allens Creek project. In the event HL&P should elect to terminate the project and thereafter be unable to have others assume its obligations with respect to equipment it has committed to purchase, HL&P could incur additional costs, in amounts which cannot presently be determined, but which could be substantial.

In the event HL&P should elect to terminate the Allens Creek project without being granted related rate relief, any unrecovered costs would be written off against income upon such determination. No estimate can be given of the potential magnitude of any such write-off. HL&P's mortgage and corporate charter specify earnings coverage and other conditions which must be complied with prior to the issuance of any additional First Mortgage Bonds or additional shares of Preferred Stock, respectively. Under such provisions, a write-off of any significant amount could severely limit or prevent the issuance by HL&P of First Mortgage Bonds and Preferred Stock based on the financial results for the twelve-month period following the write-off.

9. Jointly-Owned Electric Plant.

HL&P is project manager and one of four participants in the South Texas Nuclear Project, which consists of two 1,250 megawatt nuclear generating units. Each participant finances its own share of construction expenditures with HL&P's participating interest in the project being 30.8%. As of Dec. 31, 1981, HL&P's share of expenditures included in construction work in progress and nuclear fuel in process were $538 million and $54 million, respectively. For further discussion, see "South Texas Project Takes New Direction," page 13.

10. Federal Income Taxes.

Effective federal income tax rates are lower than statutory corporate rates for each year as follows (in $000's):

	Year Ended Dec. 31, 1981	1980	1979
[illegible] fed. inc. tax	372,351	318,084	280,153
[illegible] pfd. div. of [illegible]	20,042	20,042	19,765
Total	392,393	338,126	299,918
[illegible] rate	46%	46%	46%
[illegible] at [illegible] corp.	180,501	155,538	137,962
[illegible] in taxes resulting from:			
[illegible] for other [illegible] used [illegible] constr.	12,967	15,058	14,687
[illegible]	6,538	6,377	4,968
Total	24,505	21,435	19,655
[illegible] tax	155,996	134,103	118,307
[illegible] rate	39.8%	39.7%	39.4%

The Company had an investment tax credit carryover of approximately $9,240,000 at Dec. 31, 1981.

11. Supplementary Expense Information (in $000):

	Year Ended Dec. 31, 1981	1980	1979
[illegible] other than inc. taxes, were chgd. to exp. as follows:			
[illegible]	43,571	42,686	42,666
[illegible]	21,182	20,717	16,044
[illegible]	10,416*	7,467	6,189
[illegible]	4,121	3,671	2,885
[illegible]	8,177	6,315	5,069
[illegible]	90,427	80,856	72,853
[illegible]	5,392	5,081	3,778
[illegible]	95,819	85,937	76,631

Research and develop. costs chgd. to exp. . . . 9,003 7,731 6,046

12. Unaudited Quarterly Information.

The following unaudited quarterly financial information for 1980 and 1981 includes, in the Company's opinion, all adjustments (which comprise only normal recurring accruals) necessary for a fair presentation (in $000's):

	Rev.	Oper. Inc.	Net Inc.	[1]Earn. Per Com. Sh.
Mar. 31, 1980	459,307	70,288	28,176	.52
June 30, 1980	581,425	93,890	39,892	.69
Sept. 30, 1980	755,713	169,957	79,239	1.34
Dec. 31, 1980	570,817	95,622	[2]36,674	.57
Mar. 31, 1981	609,402	88,634	33,387	.51
June 30, 1981	759,698	117,069	48,043	.70
Sept. 30, 1981	970,094	201,995	95,117	1.38
Dec. 31, 1981	756,137	125,623	[2]39,808	.56

[1]Quarterly earnings per common share are based on the weighted average number of shares outstanding during the quarter and the sum of the quarters may not equal annual earnings per common share. Amounts shown have been restated to reflect a three-for-two stock split effective May 26, 1981.

[2]In Dec. 1980 and Nov. 1981, based on updated reserve estimates, adjustments for depreciation, depletion and amortization of approximately $8,000,000 and $6,400,000, respectively, were charged against income. In Dec. 1981, Utility Fuels wrote down to estimated recoverable value its investment in a uranium strip mining project resulting in a charge of $20,063,000.

REPORT OF CERTIFIED PUBLIC ACCOUNTANTS

(As Taken From Annual Report of Company)

We have examined the consolidated balance sheets and the statements of subsidiaries' preferred stock and long-term debt of Houston Industries Incorporated and subsidiaries as of Dec. 31, 1981 and 1980 and the related statements of consolidated income, consolidated retained earnings and changes in consolidated financial position for each of the three years in the period ended Dec. 31, 1981. Our examinations were made in accordance with generally accepted auditing standards and, accordingly, included such tests of the accounting records and such other auditing procedures as we considered necessary in the circumstances.

As discussed in Note 8, HL&P, a subsidiary of the Company, recently began a re-evaluation of its Allens Creek nuclear generating facility. Certain alternatives under consideration could result in substantial unrecoverable costs, but the ultimate outcome cannot be determined at this time. In our report dated Feb. 16, 1981, our opinion on the 1980 and 1979 consolidated financial statements was unqualified; however, in view of the matter referred to above, our present opinion on such consolidated financial statements, as expressed herein, is different from that expressed in our previous report.

In our opinion, subject to the effects on the consolidated financial statements of such adjustments, if any, as might have been required had the outcome of the uncertainty referred to in the preceding paragraph been known, such consolidated financial statements present fairly the financial position of the Company and its subsidiaries at Dec. 31, 1981 and 1980 and the results of their operations and the changes in their financial position for each of the three years in the period ended Dec. 31, 1981, in conformity with generally accepted accounting principles applied on a consistent basis.

DELOITTE HASKINS & SELLS

Houston, Texas
February 12, 1982

SUPPLEMENTARY INFORMATION TO DISCLOSE THE EFFECTS OF CHANGING PRICES (UNAUDITED)

Financial statements of business enterprises, in accordance with generally accepted accounting principles, reflect historical costs and dollars of varying purchasing power and accordingly do not measure the effects of inflation. The following unaudited supplementary information is supplied in accordance with the requirements of Financial Accounting Standards Board (FASB) Statement No. 33, Financial Reporting and Changing Prices, for the purpose of providing certain information regarding the effects of both general inflation (constant dollars) and changes in specific prices (current cost), which are not reflected in traditional financial statements. Constant dollar amounts represent historical costs stated in terms of dollars of equal purchasing power, as measured by the Consumer Price Index for all Urban Consumers (CPI-U). Current cost amounts reflect the changes in specific prices of property from the date the property was acquired to the present and may differ from constant dollar amounts to the extent that specific prices have increased more or less rapidly than prices in general. This information should be viewed only as an estimate of the approximate effect of inflation rather than as a precise measurement.

The Company's principal subsidiary, HL&P, in common with other electric utility companies in general, continues to be adversely impacted by the effects of an inflationary economy. Certain effects of inflation, such as higher interest costs associated with long-term bonds and increased operating and maintenance costs, are reflected in traditional financial statements. Increased revenues to recover such expenses, however, tend to lag behind the actual incurrence of such increased costs. Electric rates are generally based on historical costs and are designed to allow the electric utility an opportunity to recover its operating costs and earn a fair rate of return on its investment in property, plant and equipment. However, in a highly inflationary environment, expenses have increased at a much greater rate than the increase in electric sales which has resulted in an erosion of return on invested capital. It is unlikely that rates based on historical costs can keep pace with increased costs during inflationary periods. This has resulted, in part, in the need for larger and more frequent rate increases.

There are a number of other effects of inflation which are not reflected in traditional financial statements and to which the accompanying supplementary information is intended to give effect. One major expense so affected is depreciation. The cost of constructing and replacing property, plant and equipment has been escalating dramatically. Historical financial statements reflect depreciation based on the historical costs of assets and do not reflect the true economic cost of the asset "used up" and which must be replaced at substantially higher future values. However, a substantial amount of such assets are financed with long-term bonds and preferred stock which effectively acts as a hedge against the impact of inflation. Utility plants financed from investment by common shareholders and retained earnings are not afforded such a hedge. While a certain amount of the impact on such depreciation is reduced through higher returns allowed on the common equity investment in property when electric rates are established, the end result of continuing inflation is an erosion of the common shareholder's investment when viewed in terms of real purchasing power.

The Company has made significant increases in the common stock dividend over the last several years. Actual annual per share cash dividends, adjusted to give effect to the three-for-two stock split, have increased from $1.24 in 1977 to $1.99 in 1981. However, when restated in terms of average 1981 dollars, the dividend increases appear much more modest, going from $1.86 in 1977 to $1.99 in 1981. It is significant that the common stock dividends, in real terms, have been able to keep pace with inflation over the last five years, a period of very high inflation. When restated in terms of average 1981 dollars, the annual dividend rate for 1978 and 1979 was $1.97 and $1.98 for 1980, with the 1981 rate being $1.99. While this indicates that no significant growth has occurred in common stock dividends, the purchasing power of common dividends has been maintained.

Statement of Consolidated Income Adjusted For Changing Prices

(For the Year Ended Dec. 31, 1981)

(In Thousands of Dollars)

	Conventional Historical Cost [illegible]	Constant Dollar Average 1981 Dollars [illegible]	Current Cost Average 1981 Dollars [illegible]
[illegible]	2,118,138	2,118,138	2,118,138
[illegible]	216,808	216,808	216,808
[illegible] expenses	51,294	106,244	[illegible]
[illegible] and amortization	156,141	[illegible]	[illegible]
[illegible]	155,996	155,996	155,996
[illegible]	186,120	[illegible]	[illegible]
[illegible]	216,153	92,087	78,811

	Conventional Historical Cost	Constant Dollar Average 1981 Dollars	Current Cost Average 1981 Dollars
Increase in specific prices (current cost) of property, plant and equipment held during the year			572,[illegible]
Less increase in cost of property, plant and equipment adjusted for changes in general price level			612,[illegible]
Excess of increase in general price level over increase in specific prices			(79,2[illegible]
Reduction of utility property to net recoverable costs		(244,488)	(165,4[illegible]
Gain from decline in purchasing power of net amounts owed		243,907	243,[illegible]
Net		(581)	[illegible]

[1] Including the reduction to net recoverable cost, loss on a constant dollar basis would have been $152,431 for 1981.
[2] At Dec. 31, 1981, current cost of property, plant and equipment, net of accumulated depreciation was $8,106,890, while historical cost was $4,773,690.

Property, plant and equipment as referred to in the accompanying data includes utility plant in service, land, land rights and property held for future use, nuclear fuel in process, construction work in progress, coal handling equipment and oil, gas and mining property. The constant dollar information was determined by adjusting historical amounts by the ratio of the average level of the CPI-U during the year the assets were acquired or constructed to the average CPI-U index for 1981. Current cost of utility properties was determined primarily by indexing suviving plant by the Handy-Whitman Index of Public Utility Construction Costs. Oil and gas properties were restated to current costs primarily by adjusting historical costs by externally developed indexes for onshore and offshore properties. Current cost information does not represent the replacement cost of the Company's productive capacity since plant would not be replaced precisely in kind, but rather is an approximation of the current cost of existing assets.

The constant dollar and current cost provisions for depreciation were determined by applying the Company's historical depreciation rates to the restated property amounts. Restatement of depreciation, depletion and amortization of oil, gas and mining properties was computed by applying historical unit-of-production rates to the restated property amounts.

As allowed by FASB No. 33, items in the income statement, other than depreciation, depletion and amortization, were not adjusted. The cost of fuel used in electric generation and operating and maintenance expenses are essentially stated in terms of average curre[illegible] year prices and therefore do not require [illegible] statement.

In accordance with FASB No. 33, federal [illegible]come tax expense has not been adjusted. Cur[illegible]rent federal income tax policy recognizes t[illegible] certain extent the effects of inflation. Liber[illegible]ized depreciation allowances and the inve[illegible]ment tax credit accelerate capital recover[illegible] However, as the statutory federal income [illegible] rate has remained stable, the effective rate ha[illegible] increased significantly as a result of the [illegible]clining purchasing power of the related ta[illegible]able income. The Company's effective federa[illegible] income tax rate in 1981, when adjusted for [illegible]flation, is 58 percent under constant dollar a[illegible] 61 percent under current cost, each of wh[illegible] exceeds its reported effective tax rate of [illegible] percent and the statutory rate of 46 percent.

Five-Year Comparison of Selected Supplementary Financial Data Adjusted for Effects of Changing Prices

(In Thousands of Average 1981 Dollars, except per share amounts)

	1981	1980	1979	1978	1977
Revenues					
Historical	3,095,331	2,367,264	1,854,159	1,349,438	1,093,[illegible]
Constant dollar	3,095,331	2,612,815	2,323,242	1,881,202	1,644,[illegible]
Net Income					
Historical	216,355	183,981	161,846		
Constant dollar	92,057	94,393	112,894		
Current cost	78,813	81,911	95,135		
[1] Earnings per share					
Historical	$3.14	$3.14	$3.23		
Constant dollar	1.34	1.61	2.25		
Current cost	1.14	1.40	1.89		
Common Stock Equity at year-end (including electric utility property only to the extent recoverable)					
Historical	1,751,111	1,498,543	1,244,438		
Constant dollar	1,762,126	1,645,315	1,517,049		
Current cost	1,777,032	1,650,529	1,517,451		
Gain from decline in purchasing power of net amounts owed	243,907	316,487	332,703		
Excess of increase in general price level over increase in specific prices	70,298	118,325	336,115		
[1] Cash dividends declared per common share					
Historical	$1.99	$1.79	$1.57	$1.41	$[illegible]
Constant dollar	1.99	1.98	1.97	1.97	[illegible]
[1] Market price per common share at year end					
Historical	$18.13	$19.00	$19.42	$18.25	$[illegible]
Constant dollar	17.54	20.03	23.01	24.50	[illegible]
Average consumer price index	272.4	246.8	217.4	195.4	[illegible]

[1] Amounts shown for 1977 through 1980 have been restated to reflect a three-for-two stock split effective May 25, 1981.

Under the rate making prescribed by regulatory authorities to which HL&P is subject, only the historical cost of plant is recoverable through depreciation. Therefore, the excess of the cost of utility plant stated in terms of constant dollars and current cost that occurred as a result of inflation in the current year over the historical cost of utility plant is not presently recoverable in rates as depreciation and is reflected as a reduction to net recoverable cost.

To properly reflect the economics of rate regulation in the Statement of Income Adjusted for Changing Prices, the reduction of net property, plant and equipment should be offset by the gain from the decline in purchasing power of net amounts owed. During a period of inflation, holders of monetary assets suffer a loss of general purchasing power while holders of monetary liabilities experience a gain. The gain from the decline in purchasing power of net amounts owed is primarily attributable to the substantial amount of debt and preferred stock which has been used to finance property, plant and equipment. However, since the depreciation on this utility plant is limited to the recovery of historical costs, HL&P does not have the opportunity to realize a holding gain, and is limited to recovery of only the embedded cost of such capital. Thus, to the extent that utility plant is financed with debt and preferred stock the reduction to net recoverable cost and the holding gain essentially offset each other.

As a result of regulation, HL&P does not have the freedom to raise its prices in response to inflation. Further, except in the case of fuel costs, the regulatory process introduces a substantial time lag between the incurrence of operating and capital costs and the recovery of such costs. This "regulatory lag" is one of the most significant factors contributing to the erosion of investor capital. Compounding the problem is the fact that HL&P must compete in the same marketplace as a non-regulated enterprise for capital necessary to finance its construction program.

MANAGEMENT'S DISCUSSION AND ANALYSIS OF FINANCIAL CONDITION AND RESULTS OF OPERATION.

(As Taken From Annual Report of Company)

General

The Company's operating results have generally declined over the last three years. HL&P's earnings have improved as a result of rate increases which have been approved and implemented approximately once each year. However, its overall financial condition has been adversely affected by increasing negative pressures of construction financing during periods of high inflation and erratic electric sales due to uncertain economic conditions, weather and energy conservation. Primary Fuels' operating results have been markedly lower each of the last three years primarily as a result of increased depletion, depreciation and amortization expense associated with substantial capital expenditures without the establishment of significant proved reserves. The write-down of an investment in a uranium project to estimated recoverable value caused Utility Fuels to experience a loss during 1981, while earnings associated with its coal supply activities have remained constant over the last three years.

The percentage of HL&P's construction program that was financed by funds generated from operations as well as interest coverages increased during 1981 as a result of rate relief granted in October 1980 and construction expenditures remaining level over the last two years. HL&P's return on average common equity has improved somewhat during the past two years principally as a result of $106 million of rate relief realized in 1980 and $147 million in 1981. Nevertheless, as discussed under "Supplementary Information to Disclose the Effects of Changing Prices", electric rates have not kept pace with inflation. As a result, HL&P has been unable to earn the returns on common equity granted by the Public Utility Commission in its rate orders. HL&P's authorized returns on common equity for 1980 and 1981 were 15% and 15.8%, but the actual returns were 13.4% and 14.3%, respectively.

Another indication of the Company's general financial condition is the portion of net income attributable to the allowance for funds used during construction (AFUDC). AFUDC, a non-cash item, rose during 1981 because of increases in construction balances and increased accrual rates due to higher costs of capital. However, AFUDC as a percentage of earnings declined in the last two years due to HL&P earning larger current cash returns on its invested capital. Much of this improvement can be attributed to a $500 million increase [illegible] the amount of construction work in progre[illegible] and nuclear fuel in process allowed in [illegible] base by rate regulatory authorities over [illegible] last two years.

Net income for 1981 was 18% higher th[illegible] for 1980. Earnings per share, however, re[illegible]mained unchanged on a 17% increase in [illegible] weighted average number of shares outstand[illegible]ing. HL&P's contribution to the Company's per share earnings reflects an increase of 24 cents, while Primary Fuels and Utility Fuels each experienced losses for the year. To he[illegible] finance new construction, 9 million shares [illegible] additional common stock (with net proceeds of $156 million), $125 million of First Mor[illegible]gage Bonds and $96 million of pollution con[illegible]trol bonds were sold in 1981 resulting, in part in the improvement in the Company's capital[illegible]ization ratios.

Results of Operation

The contribution of Primary Fuels to [illegible] Company's earnings was 23¢ per share [illegible] 1979, primarily as the result of increased sa[illegible] of oil and gas. Primary Fuels' earnings in 19[illegible] and 1981 were adversely affected by substa[illegible]tial expenditures in its oil and gas explorat[illegible] program which caused depletion, depreciat[illegible] and amortization expenses to increase $[illegible] million and $9.5 million for 1981 and 1980 re[illegible]spectively. In addition, gas and oil sales have not kept pace with increased operating ex[illegible]penses. Gas and oil sales by Primary Fu[illegible] decreased by 13% and 19% during 1981 a[illegible] 1980, respectively, as a result of decreased de[illegible]mand and a normal decline in productive ca[illegible]pacity. Decreased sales, however, were com[illegible]pletely offset by increased prices. These fac[illegible]tors, coupled with the increase in the Compa[illegible]ny's average shares outstanding, caused Pri[illegible]mary Fuels' contribution to the Company's earnings per share in 1980 to dip to 6¢ an[illegible] caused it to experience a loss of 4¢ per share [illegible] 1981.

Utility Fuels' coal supply contract w[illegible] HL&P allows Utility Fuels to recover its co[illegible] plus a fixed return on its net investment [illegible] facilities. Thus, Utility Fuels' earnings asso[illegible]ated with its fuel delivery operations have [illegible]mained fairly constant over the last thre[illegible] years. The $5.2 million loss results from [illegible] after tax write-down of $10.8 million [illegible] investment in approximately 1.1 mi[illegible] pounds of uranium. Approximately 400[illegible]

...ds of the uranium were sold in December 81. Utility Fuels is actively seeking other buyers. As a result of the write-down, subsequent sales are not expected to have a material effect on earnings.

Earnings for HL&P increased in each of the last three years as a result of sales growth and rate increases, but were adversely affected by rapid escalation in operation and maintenance costs and rising interest rates. Although fuel expense has nearly doubled since 1979, earnings were generally unaffected due to adjustment clauses in the electric service rate schedules. The effects these factors and others have had on HL&P's results of operation are detailed below.

Revenues. As shown below, the majority of the increase in electric operating revenues has been due to the recovery of increased fuel costs through fuel adjustment clauses.

Comparative Periods	% of Revenue Increase Attributable to: Recov. of Incr. Fuel Costs	Rate Incr.	Incr. Sales
1979 v. 1978	63%	22%	15%
1980 v. 1979	63%	25%	12%
1981 v. 1980	69%	23%	8%

Increasing construction expenditures to meet load growth, coupled with inflationary pressures, have required HL&P to seek rate increases more frequently. As a result, new rates have been placed in effect in each of the past three years. KWH sales increases have averaged 4% over the last three years, contributing to the growth in revenue. This growth rate is lower than experienced historically due to conservation by customers and, in 1980 and 1981, economic conditions adversely affecting the larger industrial customers. Because of the widespread use of air conditioning, weather also significantly affects KWH sales in the HL&P service area, primarily in the residential class. An unseasonably mild summer negatively influenced 1979 electricity usage. However, an extended heat wave in 1980 caused residential KWH usage to attain record levels and average usage per residential customer increased from 13,522 KWH in 1979 to 14,219 KWH in 1980. More normal weather during the summer of 1981 contributed to a decrease in average use to 13,590 KWH for the year.

Fuel Expense. These costs have nearly doubled since 1979. The increase in the price of fuel and, to a lesser extent, increased KWH generation are the contributing factors. The rapid increase in fuel costs has contributed to the increase in HL&P's average residential revenue per KWH from 4.09¢ in 1979 to 6.29¢ in 1981. Substantially all of HL&P's natural gas requirements are being met under long-term contracts; however, larger quantities of such gas are being purchased at near-market prices. With natural gas deregulation, these prices can be expected to continue their steep climb. The increases in cost of coal for each year are due to higher delivered prices for the coal and larger requirements by HL&P for its W. A. Parish plant. HL&P brought new coal-fired units into service in each of the years 1977 through 1980. A fourth unit is scheduled to go into service prior to the 1983 peak season.

Purchased Power Expense. The increase in these costs reflects purchases of economy energy from other utilities in Texas and purchases of energy under firm contracts with neighboring utilities to meet peak loads. Four percent of HL&P's energy requirements was met with purchased power in 1981 and it is expected that reliance on other utilities will increase throughout the next several years.

Operating and Maintenance Expenses. Operation and maintenance costs have increased at a compound rate of 25% over the last three years because of general inflationary pressures, the use of larger, more complicated generating and pollution control equipment and substantial increases in labor costs. Increased reliance on coal-fired power plants has added significantly to the costs of operation and maintenance. The employee work force has increased by about 19% over the last three years as a result of increasingly complex construction and business activities, additional government regulations and the number of customers being served.

Non-Operating Items. These items are generally related to HL&P's construction activities. The costs of financing have steadily risen due to a number of factors, including larger external funds requirements, investors' expectations of continued inflation and increased competition for funds among the major users of capital. AFUDC represents the cost of funds used to finance construction projects and is capitalized as part of the cost of the assets. AFUDC is a non-cash item of net income and represents a cost-recoverable from customers through provisions for depreciation in future periods. Increases in amounts for AFUDC not only correspond to increases in construction expenditures, but also to increases in the AFUDC accrual rate and the level of investment in construction that is not earning a current cash return. Since January 1979, AFUDC has been computed using a net of tax rate closely following the company's rising embedded cost of capital. The AFUDC accrual rates for 1979 through 1981 were 7.5%, 8.5% and 9.25%, respectively. Effective Jan. 1, 1982, HL&P began accruing AFUDC at a rate of 10.0%.

Liquidity and Capital Resources

The capital requirements for 1981, and as estimated for 1982 through 1984, are as follows (in $ millions):

	1981	1982	1983	1984
Constr. and nuclear fuel (exclud. AFUDC)	644	792	1,137	1,300
Railroad cars, coal handling facilities and lignite mining and handling facilities	65	29	51	98
[1]Oil and gas expl. and develop.	73	78		
Maturities of lg.-tm. debt	30	9	65	74
Total	812	908	1,253	1,472

[1]Primary Fuels' expenditures for oil and gas exploration subsequent to 1982 cannot be estimated until the results of its 1982 exploration and development program are known.

Construction and nuclear fuel expenditures represent estimated costs of HL&P's construction program. The estimated expenditures for railroad cars, coal handling facilities and lignite mining and handling facilities are anticipated by Utility Fuels in connection with HL&P's major generating station projects.

HL&P expects to finance a portion of its construction program through funds generated internally from operations. The ability of HL&P to fund a portion of its capital requirements from internal funds is dependent to a large degree on regulatory practices which determine construction work in progress in rate base, depreciation rates, recovery of the cost of fuel used in the generation of electricity and the opportunity to earn competitive rates of return on its invested capital. It is presently estimated that during the next three years 35% to 40% of HL&P's construction program can be financed through internally generated funds from operations assuming HL&P can obtain rate relief on a timely basis at levels comparable to those recently granted by the Utility Commission.

The remainder of HL&P's construction program will be financed through proceeds received from the sale of common stock by the Company and the sales of preferred stock and long-term debt by HL&P. HL&P's capitalization ratios at December 31, 1981 consisted of 48% long-term debt, 6% preferred stock and 46% common stock and retained earnings with similar ratios expected to be maintained in the future. Principally because of HL&P's large capital requirements, Moody's Investors Service, Inc. lowered its rating of HL&P's First Mortgage Bonds and Preferred Stock in 1980 from Aa to A. In November 1981, Standard & Poor's Corporation lowered its ratings from AA to A+ for similar reasons and due to uncertainties surrounding the construction of the jointly-owned South Texas Project nuclear units. Duff & Phelps rates HL&P's bonds the equivalent of AA−. As a result of such downgradings, HL&P expects relatively higher capital costs in connection with its future sales of long-term debt and preferred stock.

Capital requirements of Utility Fuels in excess of internally generated funds are expected to be financed principally through sales of long-term debt and from leveraged leases, both involving guarantees by the Company. Primary Fuels' expenditures for 1982 are expected to be met from internally generated funds, short-term borrowings and, possibly, sales of production payments.

For information regarding bank lines of credit and short-term borrowings see Note 5 to the Consolidated Financial Statements.

FINANCIAL & OPERATING RATIOS

INCOME ACCOUNT (Consolidated):

	1981	1980	1979	1978	1977
Operating ratio %	82.77	81.84	79.99	77.16	73.72
[1]Times charges earned	2.04	3.11	2.16	2.15	2.41
Earned per avg. com. sh.	$3.14	$3.11	$3.23	$2.80	$2.94
No. of common shs. (avg.)	68,861,000	58,613,000	50,156,000	45,885,000	42,718,000
PRICE RANGES					
Common	[3]21⅝-16⅝	31⅝-21⅝	31⅝-26⅞	33¾-26¾	36¼-29¼
[2]Common (adj.)	21.75-16.63	21.13-16.38	21.00-17.50	22.25-17.88	24.00-19.50

[1]Times over-all charges (after income tax). [2]Adj. for 3-for-2 split in 1981. [3]After 3-for-2 split; before, 29⅞-25.

LONG TERM DEBT

1. Houston Lighting & Power Co. convertible subordinated debenture 5½s, due 1985:

Rating—A2

AUTH.—$40,000,000; outstg., Dec. 31, 1981, $20,000.

DATED—Feb. 1, 1970. DUE—Feb. 1, 1985.

INTEREST—F&A 1.

TRUSTEE—Bankers Trust Co., NYC.

DENOMINATION—Fully registered, $1,000 and authorized multiples.

CALLABLE—As a whole or in part, on at least 30 days' notice to each Jan. 31, incl., as follows:

[illegible] 101.08 1981 ..... 100.54 1984 ..... 100.00

SECURITY—Not secured; subordinated to senior debt.

CONVERTIBLE—Into com. shs. of Houston Industries Incorporated at $22.94 per share [illegible] of 4,582,000 common shs. by Houston Industries Incorporated in April [illegible] 3-for-2 stock split in May 1981). No adjustment for interest or divs. except debs. [illegible] after interest record date and prior [illegible] payment date must be accompanied [illegible] interest due on such date. Cash paid in [illegible] fractional shs.; conversion privilege [illegible] against dilution.

EVENTS OF DEFAULT—Trustee or 25% of debs. outstg. may declare principal due and payable on 30 days' grace for payment of interest.

INDENTURE MODIFICATION—Indenture may be modified, except as provided, with consent of 66⅔% of debs. outstg.

ASSUMED—By Co. from Houston Lighting & Power Co. pursuant to a corporate restructuring plan in 1977.

LISTED—On New York Stock Exchange.

PURPOSE—Proceeds to general funds to reduce short term debt and for construction.

OFFERED—($40,000,000) at 102 on Jan. 20, 1970 thru Halsey, Stuart & Co., Inc. and Goldman, Sachs & Co. and associates.

PRICE RANGE—	1981	1980	1979	1978	1977
High	89⅝	88	88	93	98
Low	82¾	77	81¼	82	86½

2. Subsidiaries Debt

Outstg., Dec. 31, 1981, $1,890,139,000 comprised of:

(1) $1,610,000,000 first mortgage bonds of Houston Lighting, at interest rates ranging from 2⅝% to 13⅝%, due at various dates through 2016.

(2) $18,000,000 7⅛% water pollution control revenue bonds, due 2003.

(3) $19,200,000 9⅜% water pollution control revenue bonds, due 1998.

(4) $5,000,000 9⅞% water pollution control revenue bonds, due 1998.

(5) $47,000,000 9% secured notes of Utility Fuels, Inc., due to 1988.

(6) $94,679,000 other subsidiary long term indebtedness.

(7) $65,000,000 11% poll. contr. rev., due 1984.

(8) $11,150,000 11.9% poll. contr. rev., due 1984.

(9) $20,110,000 11.9% poll. contr. rev., due 1984.

CAPITAL STOCK

Houston Industries Incorporated, common; no par:

Auth., 125,000,000 shs.; outstg., Dec. 31, 1981, 73,899,168 shs.; reserved for conversion of debs., 1,099,182 shs.; no par.

No par shs. split 3-for-2 May 26, 1981.

Entitled to one vote per share. No preemptive rights.

Dividends Paid:

1977	$1.96	1978	$2.12	1979	$2.36
1980	2.58	1981	0.74		

After 3-for-2 stk. split:

1981	1.50	1982	1.62

To Sept. 10.

Dividend Reinvestment Plan: Plan permits shareholders to automatically reinvest cash dividends in common stock of Co.; optional cash payments of not less than $50 nor more than $3,000 per calendar quarter may be made. One or both options may be chosen with no brokerage fee charged. Plan is qualified with respect to the Economic Recovery Tax Act of 1981 and is administered through Texas Commerce Bank, N.A., Houston TX.

Shareholders should contact Ms. Ann Cherry at Texas Commerce Bank at P.O. Box 2558, Houston, TX 77001 or by telephone at (713)236-4660.

Dividend Disbursing & Transfer Agent: Texas Commerce Bank N.A., Houston.

Registrar: First City National Bank of Houston.

Offered: (2,000,000 shs.) at $34 per sh. (proceeds to Co., $33.03 per sh.) on Feb. 16, 1977 thru Morgan Stanley & Co., Inc. and Dean Witter & Co., Inc. and associates. Proceeds will be invested in the com. stock of Houston Lighting, and used by Houston Lighting in its construction program including repayment of outstg. short-term borrowings incurred in connection therewith.

(2,000,000 shs.) at $29.30 per sh. (proceeds to Co., $28.48 per sh.) on Feb. 22, 1978 thru Morgan Stanley & Co., Inc., Dean Witter Reynolds Inc. and Kidder, Peabody & Co., Inc. Except for approximately $1,000,000 which will be added to the general funds of the Co., the net proceeds will be invested in the common stock of Houston Lighting, and used by Houston Lighting in its construction program including repayment of outstg. short-term borrowings incurred in connection therewith.

(2,000,000 shs.) at $29.125 per sh. (proceeds to Co., $28.385) on Feb. 7, 1979 thru Morgan Stanley & Co., Inc., Dean Witter Reynolds Inc. and Kidder, Peabody & Co., Inc. Except for approximately $2,000,000 which will be added to the general funds of the Co., the net proceeds will be invested in the common stock of Houston Lighting, and used by Houston Lighting in its construction program. To the extent that such proceeds are not immediately so used, they will be invested in short term interest bearing obligations.

(2,500,000 shs.) at $27.50 per sh. (proceeds to Co. $26.76 per sh.) on Oct. 16, 1979 thru Dean Witter Reynolds Inc.; Kidder, Peabody & Co. and associates. Proceeds will be used to reduce short-term construction debt of its principal subsidiary.

(3,000,000 shs.) at $27.375 per sh. (proceeds to Co. $26.48 per sh.) on Apr. 15, 1980 thru Kidder Peabody & Co. Inc.; Dean Witter Reynolds Inc. and associates. Proceeds invested in common stock of Houston Lighting and used by Houston Lighting to repay a portion of outstanding short term debt incurred in its construction program.

(3,000,000 shs.) at $26.50 per sh. on Oct. 2, 1980 thru Dean Witter Reynolds Inc.; Kidder, Peabody & Co. Inc. and associates. Proceeds for construction.

(3,000,000 shs.) at $25.25 per sh. on Mar. 6, 1981 thru Kidder, Peabody & Co. Inc.; Dean Witter Reynolds Inc.; Merrill Lynch White Weld Capital Markets Group and associates. Proceeds for investment in com. stock of Houston Lighting & Power Co., subsidiary, for use by Houston Lighting to defray cost of its construction program.

(4,500,000 no par shs.) at $19 per sh. on Oct. 22, 1981 thru Dean Witter Reynolds Inc., Kidder, Peabody & Co., Inc., Blyth Eastman Paine Webber Inc. and associates. Proceeds will be invested in the com. stock of Co.'s subsidiary, Houston Lighting & Power Co., to pay for expenditures and repay short-term indebtedness incurred in connection with Houston Lighting's construction program.

(4,500,000 shs.) at $18.875 per sh. on April 12, 1982 thru Goldman Sachs & Co. and associates. Proceeds from the additional shs. will be invested by Co., in the com. stock of its subsidiary, Houston Lighting & Power Co. for use by that company to pay for expenditures and repay short term indebtedness incurred in connection with its construction program.

Listed: On NYSE (Symbol: HOU). Also listed on Midwest SE. Unlisted trading on Cincinnati & Pacific Stock Exchanges.

HOUSTON LIGHTING & POWER COMPANY

(Controlled By Houston Industries Incorporated)

CAPITAL STRUCTURE

LONG TERM DEBT Issue	Rating	Amount Outstanding	[1]Times Charges Earned 1981	1980	Interest Dates	[2]Call Price	Price Range 1981	1980
1. First mtge. 2⅞s, series due 1985	[3]	$30,000,000			A & O 1	See text	[3]......	[3]......
2. First mtge. 3s, series due 1989	A 1	30,000,000			M & S 1	100.63	51 - 45⅞	55 - 45
3. First mtge. 3¼s, series due 1986	A 1	30,000,000			M & S 1	100.43	66⅝- 62⅞	67 - 57
4. First mtge. 4¾s, series due 1987	A 1	40,000,000			M & N 1	101.16	63¾- 59⅛	68 - 58
5. First mtge. 4⅞s, series due 1989	A 1	25,000,000			F & A 1	101.26	58 - 52⅜	64 - 53
6. First mtge. 4½s, series due 1992	A 1	25,000,000			F & A 1	101.76	48⅝- 42	55 - 43
7. First mtge. 5⅛s, series due 1996	A 1	40,000,000			A & O 1	103.21	47⅜- 39½	55¾- 42
8. First mtge. 5¾s, series due 1997	A 1	40,000,000			J & J 1	103.50	46½- 38¾	54⅞- 41
9. First mtge. 6⅝s, series due 1997	A 1	35,000,000			M & N 1	104.34	55⅜- 46	63⅞- 50
10. First mtge. 6¾s, series due 1998	A 1	35,000,000			A & O 1	104.03	55⅛- 45¾	63¾- 50
11. First mtge. 7½s, series due 1999	A 1	30,000,000		*	J & D 1	104.97	58¾- 49½	68⅝- 55
12. First mtge. 7⅛s, due 2001	A 1	50,000,000			F & A 1	105.27	56⅛- 47⅛	67½- 51
13. First mtge. 7⅝s, due 2001	A 1	50,000,000			J & D 1	101.35	57⅝- 48⅜	69½- 54
14. First mtge. 8⅛s, due 2004	A 1	100,000,000	3.63	3.56	F & A 1	107.16	61 - 51½	79 - 58
15. First mtge. 10⅛s, due 2004	A 1	100,000,000			M & S 1	106.55	73¼- 62⅛	90½- 72
16. First mtge. 8⅝s, due 2005	A 1	125,000,000			M & S 1	107.31	64⅞- 54⅝	81 - 62
17. First mtge. 8⅜s, due 2006	A 1	125,000,000			A & O 1	107.04	62¼- 52½	76½- 59
18. First mtge. 8⅝s, due 2007	A 1	125,000,000			A & O 1	107.94	62 - 52⅜	76 - 58
19. First mtge. 8⅞s, due 2008	A 1	125,000,000			M & S 1	107.66	65 - 54¾	79½- 62
20. First mtge. 9¼s, due 2008	A 1	100,000,000			J & D 1	107.85	67⅞- 56¾	82½- 65
21. First mtge. 11¼s, due 2009	A 1	125,000,000			J & D 1	109.92	79⅝- 67⅞	105⅞- 78
22. First mtge. 12s, due 2010	A 1	100,000,000			J & D 1	110.43	83⅝- 71¾	105 - 82
23. First mtge. 13⅞s, due 1991	A 1	125,000,000			F & A 1	[15]100	97½- 88¾	[4]......
24. First mtge. 15¼s, due 1992	A 1	[7]125,000,000			M & S 1	[16]100	[7]......	[7]......
25. 5½s debenture, due 1985	......	[12]40,000,000			F & A 1	......	......	......
26. Water poll. contr. rev. 7⅝s, due 2004	[3]	18,000,000			[5]......	[3]......	......	......
27. Water poll. contr. rev. 9.5s, due 1998	[3]	19,200,000			[5]......	[8]......	......	......
28. Water poll. contr. rev. 9.9s, due 1998	[3]	5,000,000			[5]......	[5]......	......	......
29. Water poll. contr. rev. 14.9s, due 1983	[3]	[12]20,110,000			[3]......	[14]......	......	......
30. Water poll. contr. rev. 14.9s, due 1983	[2]	11,150,000			[14]......	[3]......	......	......
31. Water poll. contr. rev. 11s, due 1984	[3]	[8][11]65,000,000			[5]...... J & D 1	[14]......	......	......

CAPITAL STOCK Issue	Par Value	Rating	Amount Outstanding	Earned per Sh. 1981	1980	Divs. per Sh. 1981	1980	Call Price	Price Range 1981	1980
1. $4 cum. pfd.	No par	"a2"	97,397 shs.			$4.00	$4.00	105	30¾- 25¾	43¼- 29
2. $6.72 cum. pfd.	No par	"a2"	250,000 shs.			6.72	6.72	[2]103.51	50¼- 43⅜	72⅝- 49
3. $7.52 cum. pfd.	No par	"a2"	300,000 shs.			7.52	7.52	[2]105.35	56¾- 48½	81½- 54
4. $9.52 cum. pfd.	No par	"a2"	400,000 shs.	$100.19	$80.64	9.52	9.52	[2]109.52	71⅞- 61¾	102½- 69
5. $9.08 cum. pfd.	No par	"a2"	400,000 shs.			9.08	9.08	[2]109.08	68½- 58½	98⅛- 64
6. $8.12 cum. pfd.	No par	"a2"	500,000 shs.			8.12	8.12	[2]109.37	61¼- 52⅜	87⅞- 59
7. $9.04 cum. pfd.	No par	"a2"	300,000 shs.			9.04	9.04	[2]109.04	68¼- 58⅜	97¾- 66
8. Common	No par	......	[9][8]69,053,418 shs.	[8]3.04	[8]3.01	[9]......	[9]......		[9]......	[9]......

[1]Before Federal income tax. [2]Subject to change, see text. [3]Issued privately. [4]Sold in Feb. 1981. [5]For details, see Gulf Coast Waste Disposal Authority in Industrial Development and Pollution Control Revenue section of Moody's Municipal & Government Manual. [6]Sold in Dec. 1981. [7]Sold in March 1982. [8]Based on avg. shs. as reported by Co. Adjusted for 3-for-2 stk. split May 26, 1981. [9]All held by Parent Co. [10]Beginning March 1, 1989. [11]Pursuant to the corporate restructuring plan in 1978, Houston Industries assumed joint and several liability with Houston Lighting for payment of principal and interest on $40,000,000 of 5½s. Convertible Debentures issued by Houston Lighting. In consideration thereof, Houston Lighting issued Houston Industries a $40,000,000 5½s Debenture. [12]Issued by Brazos River Auth. [14]For details see Brazos River Auth. Moody's Municipal & Gov't. Manual. [15]Beginning Feb. 1, 1988.

HISTORY

Incorporated under the laws of Texas on January 9, 1906 under the name of Houston Lighting & Power Company 1905. The figure 1905 was dropped from the corporate title on April 4, 1922. Since incorporation company has acquired electric properties in the following cities and towns:

1914—Houston Heights (now part of Houston).
1916—Sunset Heights and Brunner (both now part of Houston).
1918—Park Place (now part of Houston).
1925—Goose Creek (now part of Baytown), La Porte, Rosenberg, Richmond and Wharton.
1926—Needville and Humble.
1927—Pasadena, Bellaire, Pelly (now part of Baytown), South Houston and Freeport.
1929—Highlands (now part of Baytown).
1931—Galveston and Hitchcock.
1936—Rosharon.
1941—Sealy.
1946—Velasco.
1950—Sugarland.

Former Control: Until 1942, common stock of this company was owned by National Power & Light Co. Under order of SEC in Integration Proceedings 500,000 Houston shares were offered by National in exchange for its own $6 preferred stock on a basis of two Houston common shares for each National preferred share. 257,336 Houston shares were thus exchanged before termination of offer Dec. 31, 1942. The remainder of 242,664 shares was sold, May 14, 1943, to a syndicate which in turn offered the shares publicly.

Reorganization: On Jan. 14, 1977, pursuant to merger and corporate restructuring plan, all of the outstanding common stock of company was exchanged on a share for share basis with Houston Industries, Inc. common stock. Company's former subsidiaries became separate subsidiaries of Houston Industries in the reorganization. In accordance with Indenture dated as of Feb. 1, 1970 between Co. and Bankers Trust Co., as Trustee, Co.'s 5½% Convertible Debentures due 1985 thereupon became convertible into common stock of Houston Industries Incorporated rather than common stock of Co. Pursuant to a First Supplemental Indenture dated as of Jan. 14, 1977 among Co., Houston Industries and Trustee, Houston Industries assumed joint and several liability with Co. for payment of principal of (and premium, if any) and interest on, and to effect conversion of such Debentures. None of the other outstanding securities of Co., including preferred stock and first mortgage bonds were affected.

MANAGEMENT

Officers

D.D. Jordan, Chmn. of Bd. & Chief Exec. Off.
D.D. Sykora, Pres. & Chief Oper. Off.
H.R. Dean, Exec. Vice-Pres.
G.W. Oprea, Jr., Exec. Vice-Pres.
J.D. Cowart, Group Vice-Pres. (Admin.)
K.R. Hinckley, Group Vice-Pres. (Pers. & Public Affairs)
D.E. Simmons, Group Vice-Pres. (Sys. Er. Oper.)
E.A. Turner, Group Vice-Pres. (Fossil Plant Eng. & Constr.)

Vice-Presidents

A.R. Beavers	R.E. Doan
R.L. Evans, Jr.	J.H. Goldberg
R.M. McCuistion	L.B. Horrigan
J.D. Greenwade	R.S. Letbetter
A.D. Maddox	J.G. DeWease
J.D. Parsons	

J.R. Johnston, Sec. & Treasurer
J.S. Brian, Asst. Sec. & Asst. Treas.
F.C. Gemar, Asst. Sec. & Asst. Treas.
W.R. Brown, Gen. Counsel

Directors

Searcy Bracewell, Houston
W.R. Brown, Houston
H.R. Dean, Houston
John C. Echols, Baytown
Howard W. Horne, Houston

...H. Jordan, Houston
...nes & Lesch, Houston
...B. McDade, Houston
...W. Oprea, Jr., Houston
...ewart Orton, Houston
...D. Sykora, Houston
W.E. Wallbridge, Houston
J.C. Wessendorff, Richmond

Auditors: Deloitte Haskins & Sells.

Purchasing Agent: B. Commander, Jr.

Advertising Manager: W.S. Secrest.

Director Meetings: First Wed. of each month.

Annual Meeting: In May.

No. of Stockholders: Dec. 31, 1981: Preferred, 1,259; common, 1.

No. of Employees: Dec. 31, 1981, 9,317.

General Office: 611 Walker Ave., Houston, TX 77002. **Tel.:** (713)228-9211.

Mailing Address: P.O. Box 1700, Houston, TX 77001.

BUSINESS

Engaged in generation, transmission, distribution and sale of electric energy. Territory served includes Houston, Galveston, and 156 adjacent communities and rural areas. Incident to its electric business, company sells small amount of steam to Champion International, Inc. In addition, company cooperates with dealers in sale of electric appliances to its customers.

Aggregate population of territory is estimated at approximately 3,024,000.

The service area of the Company is a major producer of oil, gas, sulphur, refined products, chemicals, petrochemicals, steel, oil tools and related manufacturing, processing and servicing activities. Electronics, paper, cement, building materials, cotton, rice, cattle, salt, magnesium and other minerals are also important products of the service area.

PHYSICAL PROPERTIES

Electric properties of the company include eleven steam generating stations with installed turbine name plate generating capacity of 11,607,302 k.w. (incl. gas turb.), 187 major substations with installed transformer capacity of 35,395,234 k.v.a. and 24,080 miles of transmission and distribution lines. Approximately 80% of Company's fuel requirements during 1981 was met with natural gas, 19% was met with coal and the balance was met with oil. Chief power plants are as follows:

Deepwater—near Houston—Constructed in 1926; last unit installed in 1955. Capacity, ...125 k.w.; net generation (k.w.h.): 1981, ...,199,000; 1980, 573,496,000; fuel cost (natural gas) per k.w.h. (mills): 1981, 35.51; 1980, 29.58.

Gable Street—Houston—(on standby basis) constructed in 1900; last unit installed 1950. Capacity, 33,000 k.w.; net generation (k.w.h.): 1981, (1,626,000); 1980, (2,335,000); fuel cost (natural gas) per k.w.h. (mills): 1981, N.A.; 1980, N.A.

Hiram O. Clarke—Houston—Constructed in 1951; last unit installed in 1973. Capacity, ...k.w.; net generation (k.w.h.): 1981, ...,000; 1980, 235,585,000. Fuel cost (natural gas) per k.w.h. (mills): 1981, 48.13; 1980, ...

Greens Bayou—near Houston—Constructed in 1949. Last unit installed in 1973. Capacity ...,710 k.w.; net generation (k.w.h.): 1981, ...,000; 1980, 2,528,441,000; fuel cost (natural gas) per k.w.h. (mills): 1981, 31.12; 1980, ...

...—near Webster—Constructed in ...; last unit installed in 1965. Capacity, ... k.w. Net generation (k.w.h.): 1981, ...,000; 1980, 2,184,762,000; fuel cost (natural gas) per k.w.h. (mills): 1981, 35.15; 1980, 23.41.

...—near La Porte—Constructed in ...; Last unit installed in 1960. Capacity, ... k.w.; net generation (k.w.h.): 1981, ...,000; 1980, 3,120,137,000; fuel cost (natural gas) per k.w.h. (mills): 1981, 34.44; ....

W.A. Parish—near Richmond—Constructed in ...; last unit installed in 1980. Capacity, ... k.w.; net generation (k.w.h.): 1981, ...,000; 1980, 16,216,501,000; fuel cost (natural gas and coal) per k.w.h. (mills): 1981, ...; 1980, 22.76.

...Clarton—near Houston—Constructed in ...; last unit installed in 1960. Capacity, 286,000 k.w.; net generation (k.w.h.): 1981, 449,882,000; 1980, 1,328,831,000; fuel cost (natural gas) per k.w.h. (mills): 1981, 36.11; 1980, 29.21.

P.H. Robinson—near Bacliff—Constructed in 1966, last unit installed in 1973. Capacity, 2,177,694 k.w.; net generation (k.w.h.): 1981, 11,584,827,000; 1980, 13,193,277,000; fuel cost (natural gas) per k.w.h. (mills): 1981, 24.19; 1980, 19.70.

Cedar Bayou—near Baytown—constructed 1970. Last unit installed in 1974. Capacity, 2,093,800 k.w. Net generation (k.w.h.): 1981, 12,792,830,000; 1980, 13,073,113,000; fuel cost (natural gas) per k.w.h. (mills): 1981, 29.66; 1980, 19.96.

Gas Turbine Generating Units—Installed in 1967, 1968, 1972, 1974, 1975 and 1976 in various locations. Capacity 1,479,504 k.w.; net generation (k.w.h.): 1981, 4,309,614,000; 1980, 4,284,208,000.

Construction Program: Company estimates construction program will entail expenditures of approximately $767,000,000 in 1982, $1,120,000,000 in 1983, and $1,260,000,000 in 1984. Program includes construction of one 600,000 k.w. coal-fired steam unit at W.A. Parish plant scheduled for service in 1983; two 385,000 k.w. nuclear units at South Texas Project representing Co.'s portion of the two 1,250,000 k.w. units scheduled for service in 1987 and 1989; two 750,000 k.w. lignite-fired units known as the Limestone Electric Generating Station, to be located 18 miles southeast of Groesbeck; first unit scheduled for completion in 1986 and second in 1987; two 750,000 k.w. lignite-fired units known as the Malakoff Electric Generating Station, to be located approximately 200 miles north of Houston near the town of Malakoff; first unit scheduled for operation in 1988; the second in 1989. The Company is currently re-evaluating its planned construction of the 12,000 k.w. Allens Creek nuclear plant.

FRANCHISES

Corporate existence of the company was limited by charter to 50 years from January 9, 1906, but could be extended another 50 years at any time within 10 years of expiration by majority vote of stockholders provided company was solvent and capital unimpaired. In 1951, stockholders authorized an extension of corporate existence of company to Jan. 8, 2006. Amendment of company charter in April 1959 provided for perpetual corporate existence. Company holds a 50-year franchise from each of the 84 incorporated communities served, none of which expire before 2007. All 50-year franchises provide for payment annually by company to respective municipalities of a nominal sum of $500 plus 4% of company's gross receipts for preceding year from electric sales (other than street lighting) within corporate limits of respective municipalities. All franchises are nonexclusive.

REGULATION

Since Sept. 1976, Co.'s rates and services have been subject either to original or appellate jurisdiction of Public Utility Commission of Texas (Utility Commission). Prior to that time, its rates and services were subject to regulation only by incorporated municipalities it serves. Under Texas Public Utility Regulatory Act which created Utility Commission, each municipality may continue to exercise original jurisdiction over electric utilities operating within its borders or, by ordinance or voter referendum, may surrender its original jurisdiction to Utility Commission. If a municipality does not surrender its original jurisdiction, it may continue to exercise regulatory powers under same standards and rules as those applied by Utility Commission, or under such other standards and rules as are not inconsistent with those of Utility Commission. Sales by Co. over which Utility Commission presently has original jurisdiction accounted for approx. 46% of Company's operating revenues for twelve months ended Dec. 31, 1981.

RATES AND SERVICES

Pursuant to the Texas Public Utility Regulatory Act which was passed in June 1975, the Public Utility Commission of Texas (Utility Commission) has assumed original jurisdiction over electric rates and services in unincorporated areas of the State, and in a number of cities that have relinquished original jurisdiction. In addition, the Utility Commission has appellate jurisdiction over electric rates and services within the remaining incorporated revenues and KWH sales.

In July 1981, HL&P filed applications for general rate increases with the Utility Commission and with the 76 incorporated municipalities that had original jurisdiction over HL&P's rates and services. In its applications, HL&P requested an increase in its base operating revenues for an adjusted test year ended March 31, 1981 of $248 million, a 17.0% return on common equity and inclusion in rate base of approximately $990 million (73%) of its $1,357 million investment in construction work in progress and nuclear fuel in process. In October 1981, as a result of a settlement between HL&P, the staff of the Utility Commission and various intervenors, the Utility Commission authorized new rates designed to increase HL&P's system-wide annual revenues for the adjusted test year by approximately $189 million and to provide a return on common equity of 16.25%, with inclusion in rate base of all of the $990 million of construction work in progress and nuclear fuel in process requested by HL&P. The new rates became effective for service used on and after October 15 for all unincorporated areas and certain cities covered by the Utility Commission's order which together account for approximately 50% of HL&P's revenues. A number of cities, including Houston, issued rate ordinances authorizing smaller increases in electric rates which HL&P subsequently appealed to the Utility Commission. The Utility Commission approved rates are being collected in these cities, subject to refund, pending the outcome of public hearings scheduled for April 1982.

On Sept. 15, 1980, the Utility Commission granted an increase of $135 million on an adjusted test year ended March 31, 1980. HL&P had requested $214 million. The final order issued by the Utility Commission was based upon a settlement agreement entered into by HL&P, the Utility Commission staff and the major intervenors in the case. The final order provided for the inclusion of $677 million or 72% of construction work in progress and nuclear fuel in process in rate base and granted a 15.8% return on common equity. The Company had requested 85% of construction work in progress and nuclear fuel in process in the rate base.

RESIDENTIAL RATES

Electric: (all areas).

Effective date: Oct. 1981, $6.00 (minimum bill) incl. first 30 kwh.

Months of May through Oct.:

3.845¢ per kwh for all additional kwh; however, if aggregate usage in any of these months is less than 750 kwh the Nov. through April rate will apply

Months of Nov. through April:

2.345¢ per kwh for all addit. kwh

COMPETITION

Territory served by company is near the projects constructed by the Lower Colorado River Authority but service areas are clearly defined for both company and the Authority. For details see blue insert; also contract for sale and interchange of power.

Company has made no representation as to possible future effects of the program of the Rural Electrification Administration created by the Federal Government.

The Public Utility Commission, under the authority granted it by the Public Utility Regulatory Act, has established the service area boundaries of the Company.

CONTRACT

HL&P has contracted with the City of Austin, Texas to purchase up to 800 megawatts of Austin's generating capacity through 1987. HL&P has also contracted with the City Public Service Board of San Antonio to purchase varying amounts of capacity during the years 1982 through 1987, ranging from 200 to 500 megawatts.

In connection with the Austin agreement, Company entered into an agreement with the Lower Colorado River Authority to transmit the power purchased from the City of Austin. The transmission services started on Jan. 1, 1980 and will end December 31, 1988.

...ATISTICS

OPERATING STATISTICS, YEARS ENDED OR ON DEC. 31

(Taken from reports to Federal Energy Regulatory Commission)

	1981	1980	1979	1978	1977	1976	1975
[illegible]	3,023,000	2,885,000	3,006,000	2,980,000	2,721,000	2,625,000	2,529,000
[illegible]	982,035	909,016	849,319	778,850	[illegible]	663,095	623,865
[illegible]	135,573	125,931	118,896	112,574	103,168	95,969	89,653
...& [illegible]	76	76	76	87	83	81	77
	1,117,684	1,035,023	968,291	891,509	[illegible]	[illegible]	713,595
[illegible]	12,917,358,000	[illegible]	11,6[illegible]8,887,101	10,956,913,791	9,739,136,999	8,329,177,260	8,427,429,212
...& [illegible]	36,666,804,000	[illegible]	38,123,125,176	36,377,330,137	[illegible]	29,735,[illegible]	27,470,103,149
[illegible]	3,496,102,000	3,230,274,[illegible]	3,158,440,[illegible]	2,941,322,283	2,[illegible]	[illegible]	2,248,716,342
Total	56,880,364,000	54,805,619,214	52,300,502,[illegible]	50,275,566,531	45,[illegible]	40,8[illegible]	38,146,548,703

STATISTICS (Cont'd):

	1981	1980	1979	1978	1977	1976	1975
Revenues:							
[1] Residential & rural	$812,414,077	$628,599,064	$453,354,216	$367,729,764	$301,821,360	$241,583,676	[illegible]
Commercial & industrial	1,822,369,349	1,387,906,010	1,140,715,305	867,331,661	707,901,942	556,182,050	[illegible]
Other	134,431,796	107,451,810	85,531,921	60,967,951	50,852,654	39,402,479	[illegible]
Total	$2,769,215,222	$2,123,956,884	$1,679,601,442	$1,296,029,376	$1,060,578,957	$837,167,605	[illegible]
K.w.h. generated (net)	57,165,347,000	57,228,126,000	54,678,417,000	53,101,474,000	48,534,625,000	43,353,203,000	[illegible]
K.w.h. purchased	2,448,366,000	720,293,000	377,387,000	222,670,000	325,000	610,000	[illegible]
System peak load k.w.	10,540,000	10,266,000	9,602,000	9,362,000	8,645,000	8,219,000	[illegible]
SALARIES AND WAGES:							
Electric	$140,321,239	$118,743,648	$102,862,737	$78,151,579	$69,244,390	$53,287,229	[illegible]
Utility plant	53,026,367	42,811,250	38,441,531	30,465,964	27,842,296	21,579,863	[illegible]
Other	20,395,684	14,370,741	12,112,457	7,190,437	5,193,131	2,861,070	[illegible]
Total	213,743,290	$175,925,639	$153,416,725	$115,807,980	$102,279,817	$77,728,162	[illegible]

[1]Residential only.

INCOME ACCOUNTS

COMPARATIVE INCOME ACCOUNT, YEARS ENDED DEC. 31
(Taken from reports filed with the Securities and Exchange Commission)
(in thousands of dollars)

	1981	1980	1979	1978	1977	1976	1975
Total operating revenue (electric)	2,769,215	2,123,957	1,707,527	1,303,604	1,069,786	841,616	[illegible]
Operating expenses	1,940,606	1,440,334	1,137,102	823,849	633,244	449,876	[illegible]
Maintenance	117,205	97,598	77,703	55,354	43,719	33,344	[illegible]
Depreciation	115,411	101,134	93,448	73,261	63,792	57,030	[illegible]
Amort. of limited term util. invest.	19	19	19	19	19	19	[illegible]
Amort. of prop. losses	3,044	2,618	278	......	......	......	......
Federal taxes:							
Income	44,168	26,233	10,911	10,229	19,194	37,601	[illegible]
Deferred income taxes	61,049	59,811	44,515	37,831	30,879	24,782	[illegible]
Investment tax credit	60,764	44,414	56,726	46,665	44,944	26,195	[illegible]
Other taxes	10,167	7,430	6,054	4,736	3,620	2,996	[illegible]
State and local taxes	80,160	73,426	63,915	55,436	47,815	44,368	[illegible]
Total oper. revenue deductions	2,432,593	1,853,017	1,490,671	1,107,370	887,226	676,211	[illegible]
Net operating revenue	336,622	270,940	216,901	196,234	182,560	165,405	[illegible]
[1]Allow. for funds used during constr.	......	......	......	......	......	16,384	[illegible]
[1]Allow. for other funds used during constr.	39,058	32,735	31,928	17,029	14,088	......	......
Other income	3,692	4,682	914	4,271	1,865	1,450	[illegible]
Gross income	379,372	308,357	249,743	217,534	198,513	183,239	[illegible]
Interest on long term debt	146,513	122,695	101,566	84,307	71,799	61,098	[illegible]
Amortiz.—debt disc. & exp. (net)	380	153	45	cr21	cr9	cr30	[illegible]
[1]Allow. for borrowed fds. used during constr.	cr11,470	cr9,619	cr10,911	cr11,639	cr9,821	......	......
[2]Tax alloc. of AFUDC	cr9,770	cr8,194	cr9,294	......	......	......	......
Other interest charges	7,388	5,159	2,136	5,208	2,293	6,867	[illegible]
Other deductions	1,129	808	485	300	127	148	[illegible]
Total income deduction	134,170	111,002	84,027	78,155	64,389	68,083	[illegible]
Net income	245,202	197,356	165,716	139,379	134,124	115,156	[illegible]
Retained earnings, beg. of year	691,489	620,034	553,213	497,079	429,550	368,656	[illegible]
Total credits	936,691	817,390	718,928	636,458	563,674	483,812	[illegible]
Preferred dividends	20,042	20,042	19,765	17,330	13,711	12,362	[illegible]
Common dividends (stock)	137,954	105,859	79,129	65,913	52,884	41,900	[illegible]
Retained earnings, Dec. 31	778,695	691,489	620,034	553,213	497,079	429,550	[illegible]

[1]Effective Jan. 1, 1977, Federal Power Commission, predecessor of Federal Energy Regulatory Commission (which does not have jurisdiction over Co. or its rates), issued an order which provides a formula for computing a maximum allowable AFC rate and requires reclassification of AFC into a "borrowed funds" and an "other funds" component. Since Jan. 1, 1977 accrual of AFC has been reclassified for income statement presentation to show such components.

[2]Prior to Jan. 1979, deferred income taxes were not recognized on the interest component of AFUDC which is deducted currently for federal income tax purposes.

Statement of Changes in Financial Position (in $000):

Source of Funds:	1981	1980
Net income	245,202	197,356
Depreciation	125,329	108,298
Deferred inc. taxes—net	51,280	51,617
Inv. tax credit def. net	53,130	44,414
Funds used during constr. (cr.)	(50,528)	(43,354)
Sale of first mtge. bonds	125,000	100,000
Sale of com. stk.	162,925	172,465
[1]Sale of poll. contr. bds.	96,260	5,000
Chge. in notes pay. & temp. cash invest.	(29,292)	101,915
Recl. to curr. mat. of lg. tm. debt	......	[illegible]
Other—net	(24,001)	[illegible]
Total	755,305	[illegible]
Application of Funds:		
Prop. add. (net of allow. for funds used dur. constr.)	643,762	[illegible]
Dividends	157,996	[illegible]
Total	801,758	[illegible]
[2]Incr. in Working Capital	d46,453	d42,1[illegible]

[1]Net of proceeds held by Trustee.
[2]Excl. notes payable & temporary cash invest.

Record of Earnings, years ended Dec. 31 (in thousands of dollars):

	Oper. Revenues	Oper. Expenses	Maintenance	Depreciation	Taxes	Net Oper. Revenue	Gross Income	Income Deduct.	Net Income	Common Divs.	[1]No. of Com. Shs.	[1]Earn. per Com. Sh.
1975	634,153	323,502	36,455	51,091	94,099	129,004	138,654	68,269	70,385	34,713	23,752,127	[illegible]
1974	486,837	212,406	31,217	45,146	89,022	109,044	118,277	48,399	69,878	32,628	21,752,127	[illegible]
1973	409,060	158,061	29,091	39,224	85,062	97,620	106,586	34,677	71,909	29,928	21,752,127	[illegible]
1972	363,640	129,636	28,187	34,969	79,825	91,023	98,045	32,372	65,673	27,543	20,252,127	[illegible]
1971	317,794	113,158	21,378	30,936	69,839	82,483	86,975	27,489	59,486	26,125	20,252,127	[illegible]
1970	282,752	99,605	21,744	27,760	61,841	71,802	77,131	23,280	53,851	24,303	20,252,127	[illegible]
1969	262,534	88,007	17,020	26,203	65,559	65,745	68,404	20,454	47,949	22,682	20,252,127	[illegible]
1968	235,529	79,628	16,507	23,149	57,922	58,323	61,211	18,406	42,805	22,075	20,252,127	[illegible]
1967	206,133	71,113	14,110	20,463	48,021	52,425	55,276	14,481	40,795	20,252	20,252,127	[illegible]
1966	190,999	64,165	10,904	18,714	47,424	49,792	50,184	9,081	41,103	20,252	20,252,127	[illegible]
1965	180,220	57,950	9,055	17,434	47,388	48,393	48,864	8,132	40,731	18,632	20,252,127	[illegible]
1964	166,100	53,977	10,036	16,407	43,628	42,052	42,707	7,918	34,789	15,797	20,252,127	[illegible]
1963	155,193	49,906	7,584	15,719	42,838	39,146	39,588	8,086	31,502	13,974	20,252,127	[illegible]
1962	141,649	45,436	6,774	15,261	3[illegible],786	35,577	35,843	8,456	27,397	11,476	6,750,709	[illegible]
1961	120,497	39,182	5,913	14,642	30,814	29,946	29,976	8,444	21,532	10,801	6,750,709	[illegible]
1960	115,837	36,640	5,459	13,309	30,352	30,073	30,101	7,618	22,483	10,801	6,750,709	[illegible]
1959	104,675	32,484	5,084	11,904	27,915	27,288	27,324	6,401	20,923	10,801	6,750,709	[illegible]
1958	94,362	28,976	4,663	10,102	25,577	25,043	25,312	5,104	20,208	10,801	6,750,709	[illegible]
1957	87,102	26,978	4,748	8,785	23,713	22,879	23,026	4,079	18,947	10,244	6,750,709	[illegible]

[1]Does not reflect 3-for-2 stock split effective May 26, 1981.

BALANCE SHEETS

COMPARATIVE BALANCE SHEET, AS OF DEC. 31
(Taken from reports filed with the Securities and Exchange Commission)
(in thousands of dollars)

ASSETS	1981	1980	1979	1978	1977	1976	1975
Electric plant	5,107,441	4,455,713	3,816,988	3,316,468	2,887,930	2,162,603	[illegible]
Depreciation reserve	777,203	678,717	591,465	512,604	450,946	396,417	[illegible]
Nuclear fuel	121,683	104,947	83,947	69,995	61,291	32,109	[illegible]
Net utility plant	4,451,921	3,881,943	3,309,470	2,873,859	2,498,275	2,098,295	[illegible]

BALANCE SHEETS (Cont'd):	1981	1980	1979	1978	1977	1976	1975
Other physical property	......	......	......	......	......	26	9
Cash	9,747	11,840	11,614	10,051	11,563	9,995	12,704
Temporary cash investments	......	......	52,129	68,664	......	......	......
Special deposits	8,838	4,937	4,927	4,253	3,683	3,243	3,384
Working funds	290	440	339	391	270	212	167
Accounts and notes receivable (net)	126,144	102,885	82,207	85,812	62,611	62,559	39,826
Materials and supplies	129,656	97,544	79,139	70,945	69,439	77,143	83,998
Prepayments	3,119	2,934	14,046	2,192	2,727	2,749	1,565
Total current and accrued assets	277,794	220,580	244,401	242,308	150,293	155,927	141,653
Miscellaneous deferred debits	66,937	48,786	43,111	24,662	19,695	9,842	4,612
Total assets	4,796,652	4,151,309	3,596,982	3,140,829	2,668,263	2,264,064	1,989,786
LIABILITIES							
Common stock	923,666	760,741	588,276	456,758	391,534	324,094	258,688
Preferred stock	243,518	243,518	243,518	213,945	214,000	163,847	124,482
Retained earnings	778,695	691,489	620,034	553,213	497,079	429,550	368,656
Total stockholders' equity	1,945,879	1,695,748	1,451,828	1,223,916	1,102,613	917,490	751,826
Mortgage debt	1,610,000	1,505,000	1,405,000	1,280,000	1,055,000	930,000	805,000
Other long-term debt	138,460	42,200	37,200	34,926	18,000	18,000	18,000
Conv. debenture	40,000	40,000	40,000	40,000	40,000	40,000	40,000
Total long-term debt	1,788,460	1,587,200	1,482,200	1,354,926	1,113,000	988,000	863,000
Notes payable	21,578	50,870	1,084	2,197	• 24,829	6,304	131,866
Curr. portion l.t. debt	......	20,000	......	......	......	......	......
Accounts payable	236,532	142,851	126,646	115,389	79,810	70,784	39,033
Customer deposits	18,148	11,542	9,008	6,364	6,321	4,908	4,494
Taxes accrued	51,809	44,245	27,278	33,571	24,430	43,039	32,160
Interest accrued	37,269	29,324	28,086	26,844	22,309	20,557	18,933
Other current liabilities	69,591	61,720	48,227	42,004	31,674	25,753	19,468
Total current and accrued liabilities	434,927	360,552	240,329	226,369	189,373	171,345	245,954
Customers advances for construction	17,198	22,121	18,578	19,103	19,563	15,050	9,128
Accum. def. investment tax credits	289,575	235,791	192,606	145,452	106,589	67,660	42,931
Other deferred credits	3,379	*cr*19,732	*cr*1,747	704	2,105	2,716	87
Unamortized premium on debt, net	*cr*8,470	*cr*6,005	*cr*2,200	*cr*959	*cr*274	*cr*453	81
Total deferred credits	301,682	232,175	207,237	162,892	127,983	84,973	52,227
Accum. deferred income taxes	317,584	267,249	206,569	163,818	126,940	94,511	69,729
Injuries and damages reserve	......	......	450	408	354	244	50
Other reserves	8,120	8,385	8,369	8,500	8,000	7,500	7,000
Total liabilities	4,796,652	4,151,309	3,596,982	3,140,829	2,668,263	2,264,064	1,989,786
Net current assets	*d*157,133	*d*139,972	4,072	15,939	*d*39,080	*d*15,418	*d*104,301

Due to accelerated amortization and liberalized depreciation.

Represented by no par shares:
$4 series: 1974-80, 97,397 shares.
$6.72 series: 1973-79, 250,000 shares.
$7.52 series: 1973-79, 500,000 shs.
$9.52 series: 1975-79, 400,000 shs.
$9.08 series: 1976-79, 400,000 shs.
$8.12 series: 1977-79, 500,000 shs.
$9.04 series: 1979, 300,000 shs.

Represented by no par shares: 1981, 74,081,841; 1980, 42,964,777; 1979, 36,217,276; 1978, 31,314,966; 1977, 29,004,642; 1976, 26,752,127; 1975, 23,752,127.

Notes: (a) Prior to May 14, 1943, company was a subsidiary of a public utility holding company and subject to the provisions of the Public Utility Holding Company Act of 1935. On that date company ceased to be such subsidiary. Company, while such a subsidiary, was required to adopt FERC Uniform System of Accounts pursuant to Securities and Exchange Commission Rule U-27, promulgated under P.U.H. Act of 1935. Subsequent to May 14, 1943, company generally follows FERC Uniform System of Accounts and files reports with FERC but expressly denies jurisdiction of FERC over facilities owned by company or the right of FERC to require reports in connection therewith. Company in 1945 completed a study and reclassification of plant, property and equipment (including intangibles). The reserve previously designated as amortization, depreciation, renewals and replacement reserve was subdivided to correspond with related assets accounts and effective Jan. 1, 1945, company instituted straight-line depreciation accounting, annual provisions being approximately 3% of total depreciable cost of electric plant.

(b) Deferred Federal Income Taxes: After 1969, Co. began using liberalized depreciation method for federal income tax purposes. Co. uses tax guideline lives for property acquired before 1971, and elected to adopt federal income tax "class life system" for 1973-72 property additions. Pursuant to the Economic Recovery Tax Act of 1981, the ACRS method is used for post 1980 properties. Deferred income taxes have been provided on difference between depreciation computed using these methods and straight-line tax depreciation otherwise allowable.

Investment tax credit applied as a reduction of federal income taxes has been deferred and is being amortized over estimated lives of related property. Credits deferred aggregated $60,764,000 in 1981 and $44,414,000 in 1980.

Auditor's Report: The following is an excerpt from the Report of Independent Auditors, Deloitte Haskins & Sells, as it appeared in 1981 Annual Report.

"As discussed in Note 7, the Company recently began a re-evaluation of its Allens Creek nuclear generating facility. Certain alternatives under consideration could result in substantial unrecoverable costs, but the ultimate outcome cannot be determined at this time. In our report dated February 16, 1981, our opinion on the 1979 and 1980 financial statements was unqualified; however, in view of the matter referred to above, our present opinion on such financial statements, as expressed herein, is different from that expressed in our previous report.

In our opinion, subject to the effects on the financial statements of such adjustments, if any, as might have been required had the outcome of the uncertainty referred to in the preceding paragraph been known, such financial statements present fairly the financial position of the Company at December 31, 1980 and 1981 and the results of its operations and the changes in its financial position for each of the three years in the period ended December 31, 1981, in conformity with generally accepted accounting principles applied on a consistent basis.

Our examinations also comprehended the supplemental schedules V, VI, VIII and IX for each of the three years in the period ended December 31, 1981. In our opinion, subject to the effects on Schedule V of such adjustments, if any, as might have been required had the outcome of the uncertainty referred to in the second preceding paragraph been known, such supplemental schedules, when considered in relation to the basic financial statements, present fairly in all material respects the information shown therein."

FINANCIAL & OPERATING RATIOS

(Ratios and data compiled from reports to Federal Energy Regulatory Commission)

ELECTRIC OPERATIONS	1981	1980	1979	1978	1977	1976	1975
Ratio pop. to res. cust.	3.08	3.17	3.65	3.72	3.85	3.96	4.04
Res. sales % of total	22.71	22.93	21.16	21.79	21.27	20.87	22.09
Res. revs. % of total	29.33	29.60	26.99	28.37	28.46	28.90	31.94
Res. av. rate per k.w.h.—cents	6.29	5.00	4.09	3.36	3.09	2.8	2.4
Res. aver. cust. use (k.w.h.)	13,590	14,219	13,522	14,734	14,266	13,146	13,508
INCOME ACCOUNT							
Deprec. of gross oper. rev.	4.3	4.9	5.5	5.6	6.0	6.8	8.1
Maintenance of gr. oper. revenue	4.2	4.6	4.55	4.25	3.09	3.96	5.7
Deprec. of utility plant	2.3	2.3	2.5	2.2	2.2	2.3	2.3
Net oper. rev. to net util. plant	7.6	7.0	6.6	6.8	7.3	7.9	7.0
Operating ratio	81.85	84.10	80.74	77.68	74.05	69.9	71.5
Times charges earned before inc. taxes	3.6	3.56	3.68	3.62	3.09	3.00	2.84
Times charges earned after inc. taxes	2.52	2.54	2.60	2.50	2.81	2.69	2.03
Times charges & pfd. div. earned aft. inc. tax.	2.23	2.20	2.18	2.13	2.37	2.28	1.86
Earned per share preferred	$100.19	$80.64	$68.38	$64.91	$78.38	$71.43	$36.43
Earned per share com. (year end shs.)	$3.01	$4.13	$4.03	$3.90	$4.15	$3.84	$2.69
Earned per sh. com. (yr. end)—adj.	$3.04	$2.75	$2.69	$2.60	$2.77	$2.56	$1.79
Dividend per share common (avg.)	$3.26	$4.52	$4.34	$3.97	$4.21	$3.92	$2.89
Earned per sh. com. (avg.)—adj.	$3.26	$3.01	$2.89	$2.65	$2.81	$2.61	$1.93
Book value per common share (actual)	$23.00	$33.80	$33.36	$32.25	$30.64	$28.58	$28.25
Net tang. assets per sh.—adj.	$23.00	$22.53	$22.24	$21.50	$20.33	$19.05	$18.83
Number of shares—$4 preferred	97,397	97,397	97,397	97,397	97,397	97,397	97,397
$6.72 preferred	250,000	250,000	250,000	250,000	250,000	250,000	250,000
$7.52 preferred	500,000	500,000	500,000	500,000	500,000	500,000	500,000
$9.52 preferred	400,000	400,000	400,000	400,000	400,000	400,000	400,000
$9.08 preferred	400,000	400,000	400,000	400,000	400,000	400,000	......
$8.12 preferred	500,000	500,000	500,000	500,000	500,000		......
$9.04 preferred	300,000	300,000	300,000	......			
Com. (avg.)	69,053,418	39,247,183	33,633,932	30,748,381	28,621,146	26,752,127	22,997,900
Com. (avg.)—adj.	74,081,841	55,870,774	50,116,548	46,122,572	42,941,719	40,128,190	33,145,500

FINANCIAL RATIOS (Cont'd):	1981	1980	1979	1978	1977	1976	1975
—com. (year end)	74,001,841	42,964,777	36,217,276	31,314,996	29,004,642	26,752,127	[illegible]
—com. (year end)—adj.	69,053,418	64,447,166	54,325,914	46,972,494	43,506,963	40,128,190	[illegible]
BALANCE SHEET							
% of total capitalizat. represented by:							
Common stock & surplus	45.6	44.5	41.2	39.2	40.1	39.5	[illegible]
Preferred stock	6.5	7.5	8.3	8.3	9.7	8.6	[illegible]
Long term debt	47.9	48.0	50.5	52.5	50.2	51.9	[illegible]
% Mtge. debt of deprec. plant	37.2	39.9	43.6	45.7	44.6	47.1	[illegible]
Ratio gross plant to gross revs.	1.84	2.10	2.23-1	2.54-1	2.70-1	2.93-1	[illegible]
% deprec. res. to gross plant	15.23	15.24	15.5	15.5	15.6	16.1	[illegible]
PRICE RANGE							
First 3s, 1989	51-45⅞	55-45	63¾-56	60⅞-57⅞	62.428-54⅝	62½-54	[illegible]
First 3¼s, 1986	66⅝-62⅝	67-57	71⅝-64¼	70⅞-67	72-66¾	71⅝-62	[illegible]
First 4¾s, 1987	63¾-59⅛	68-58	75¼-67⅜	77⅞-68½	78¼-72	75¾-70	[illegible]
First 4⅞s, 1989	58-52¾	64-53	73⅜-65¼	74-57	76-72¾	76½-66	[illegible]
First 4½s, 1992	48⅝-42	55-43	64¾-56¼	66⅞-61	69½-64⅞	70½-59	[illegible]
First 5¼s, 1996	47⅜-39½	55¾-42	66⅜-57⅛	70-62¾	71⅝-68¼	72-65	[illegible]
First 5¼s, 1997	46½-38¾	54¾-41	65¾-56½	69½-61¾	72-70	74¼-65	[illegible]
First 6⅝s, 1997	55⅞-46	63¾-50	77⅛-66½	83½-74	85¼-81⅞	88⅝-78	[illegible]
First 6¼s, 1998	55⅛-45¾	63¾-50	77-66¼	83½-73¾	85½-81⅝	86¼-78½	[illegible]
First 7½s, 1999	58¾-49½	68¾-55	83⅞-70⅞	90½-80	93½-87⅞	98⅛-85	[illegible]
First 7¼s, 2001	56¼-47¼	67½-53	81-68½	86¾-77	90½-85½	92¼-82	[illegible]
First 7½s, 2001	57⅝-48⅜	69½-54	83⅛-69⅞	89¼-79	91⅛-86	92-84	[illegible]
First 8⅛s, 2004	61-51½	79-58	88¾-73⅞	95¼-84¼	98⅝-92⅛	101⅛-90	[illegible]
First 10⅛s, 2004	73¼-62⅛	90½-72	104⅜-88½	109⅞-101¼	111½-107¼	114-104	[illegible]
First 8¾s, 2005	64⅞-54⅝	81-62	93¾-78	100-90	103¾-99⅝	105-95	[illegible]
First 8⅝s, 2006	62¼-52½	76½-59	90¼-75¼	98¼-86	102-98.115	102¾-96	[illegible]
First 8⅝s, 2007	62-52⅜	76-58	90⅞-75	98¼-86	100¾-98.100	......	[illegible]
First 8⅞s, due 2008	65-54¾	79½-62	94¾-78⅜	100-95⅝	......	......	[illegible]
First 9¼s, due 2008	67⅜-56¾	82½-65	98-80¾	99½-97⅝	......	......	[illegible]
First 11¼s, due 2009	79⅝-67⅞	105⅞-78½	96½-96½	......	......	......	[illegible]
First 12s, due 2010	83⅝-71¾	105-82	......	......	......	......	[illegible]
First 13⅞s, due 1991	97½-88⅜	......	......	......	......	......	[illegible]
$4 cum. preferred	30¼-25¾	43¼-29¼	44¾-35⅜	43-37	49-45	48½-41⅝	[illegible]
$6.72 cum. preferred	50¾-43⅜	72⅝-49	75-60	......	85¼-81	84-73	[illegible]
$7.52 cum. preferred	56¾-48½	81¼-54⅞	84-67⅛	92¼-92¼	95¾-92¼	91⅛-82¼	[illegible]
$9.52 cum. preferred	71⅞-61⅜	102⅞-69½	106⅜-85	......	112-107	110-101⅛	[illegible]
$9.08 cum. preferred	68½-58½	98⅛-64¼	101½-81	99-99	109¾-101	108½-99½	
$8.12 cum. preferred	61¼-52⅜	87⅞-59¼	90¾-72½	100-97½	99¾-99⅝	......	
$9.04 cum. preferred	68¼-58⅜	97¾-66	101-80¾	......	......	......	

[1]Residential only.

Additional Miscellaneous Ratios and Data (Compiled from Uniform Statistical Reports):

	1981	1980	1979	1978	1977	1976	1975
Financial Ratios							
Gross inc. % long term debt	30.4	27.9	24.4	23.0	26.4	27.5	[illegible]
Margin of safety—%	14.8	15.4	16.3	18.0	21.4	24.2	[illegible]
% of rev. available for common	8.1	8.3	8.6	9.4	11.3	12.2	[illegible]
Dividend payout—%	61.2	59.7	54.2	54	44	41	[illegible]
Avg. annual yield—%	10.4	[1]9.5	[1]8.2	[1]7.0	[1]5.7	6.1	[illegible]
Avg. times earnings	5.9	[1]6.2	[1]6.7	[1]7.6	[1]7.8	6.8	[illegible]
Miscellaneous							
Fuel cost—% of rev.	57.0	56.8	56.11	52.34	48.4	42.0	[illegible]
System capacity, Kw (000)	11,763	11,763	11,193	10,828	10,427	9,791	[illegible]
System peak, Kw (000)	10,540	10,266	9,602	9,362	8,645	8,219	[illegible]
Load factor %	60	62	65	65	64	60	
Heat rate (BTU per kwh)	10,222	10,284	10,285	10,223	10,154	10,042	[illegible]
Fuel—avg. cost per mcf	2.89	2.16	1.75	1.30	1.09	0.84	[illegible]
Fuel—avg. cost per bbl.	18.31	16.63	11.53	12.16	11.48	10.14	[illegible]
Fuel—avg. cost per ton (coal)	42.00	......	......	......	......	......	
Employees	9,317	8,768	7,970	7,252	6,500	5,900	[illegible]
Employees per $1 million rev.	3.36	4.13	4.68	5.56	6.08	7.01	[illegible]

[1]Based on Houston Industries Incorporated shares outstanding. [2]Adjusted for 3-for-2 stock split effective May 26, 1981.

LONG-TERM DEBT

1. Houston Lighting & Power Co. first 2¾s, due 1985:

Outstanding, this series, Dec. 31, 1981, $30,000,000; sold privately in Apr., 1950. Proceeds used to refund first mortgage bonds and balance for construction expenditures.

Dated Apr. 1, 1950; due Apr. 1, 1985; interest payable A&O1; Texas Commerce Bank N.A., Houston, trustee.

Callable as a whole or in part on at least 30 days' published notice at any time to Mar. 31, 1951 at 104.13, premium decreasing annually to par after Mar. 31, 1984; and for sinking fund on like notice to Mar. 31, 1951 at 101.13, premium decreasing annually to par after Mar. 31, 1984.

Security and other provisions same as 3s, 1989, below.

2. Houston Lighting & Power Co., first 3s, due 1989:

Rating—A 1

AUTHORIZED—Unlimited; outstanding, 1989 series, Dec. 31, 1981, $30,000,000.
DATED—Mar. 1, 1954.
MATURITY—Mar. 1, 1989.
INTEREST—M&S1 at office of trustee or Morgan Guaranty Trust Co., New York.
TRUSTEE—Texas Commerce Bank N.A., Houston.
DENOMINATION—Coupon, $1,000; registerable as to principal; fully registered $1,000 or authorized multiples thereof., C&R interchangeable.
CALLABLE—As a whole or in part on 30 days' notice at any time to the last day of each Feb., incl., as follows:

1982	100.71	1983	100.63	1984	100.55
1985	100.62	1986	100.46	1987	100.31
1988	100.20	1989	100.00		

Also callable on like notice as above for sinking or improvement fund (which see), or replacement fund, or with certain deposited cash, at special prices to the last day of each Feb., incl., as follows:

1982	100.71	1983	100.63	1984	100.55
1985	100.47	1986	100.38	1987	100.29
1988	100.20	1989	100.00		

SINKING OR IMPROVEMENT FUND—Annually beginning 1957, in cash or 1989 series bonds or with property additions at 60%, equal to 1% of greatest amount of 1989 series bonds at any one time outstanding, less certain bonds retired. Requirement may not be anticipated.
REPLACEMENT FUND—Annual expenditure for replacements, etc. of $1,450,000 plus 2½% of net additions to depreciable mortgaged property made after Mar. 31, 1948 and prior to July 1 of preceding year. Requirement may be met with cash, bonds, gross property additions, expenditures for repairs, etc. or by taking credit for property additions as certified under the mortgage.
SECURITY—Secured equally and ratably with other series outstanding by first lien on entire property now owned or hereafter acquired, except cash, securities not specifically pledged, materials and supplies, receivables, contracts, rights and royalties. Mortgage provides for release of property made subject to the mortgage or already subject thereto unless such property was owned at Oct. 31, 1944, or made the basis of bonds issued or a credit under the mortgage.
ADDITIONAL BONDS—Of this or other series ranking equally as to lien may be issued (1) for 60% of cost or fair value of net property additions (as defined); (2) for principal of bonds retired and (3) for cash deposited provided net earnings are at least twice annual interest requirements on all bonds outstanding and to be issued except that no earnings test is required to refund prior liens and such test is required to refund bonds under the mortgage only as specified. Company may acquire property subject to liens and company may issue bonds under the mortgage on the basis of such property as provided.
RIGHTS UPON DEFAULT—In event of default (60 day grace period for payment of interest and sinking fund), trustee or holders of 25% of bonds may declare bonds due and payable.
INDENTURE MODIFICATION—Indenture may be modified with consent of 70% of bonds.
PURPOSE—Proceeds for construction.
OFFERED—($30,000,000) at 102.189 (proceeds to company 101.529999) on Mar. 2, 1954 by Halsey, Stuart & Co., Inc., Chicago, and associates.

3. Houston Lighting & Power Co. first 3¼s, due 1986:

Rating—A 1

AUTHORIZED—Unlimited; outstanding, 1986 series, Dec. 31, 1981, $30,000,000.
DATED—Mar. 1, 1956.
MATURITY—Mar. 1, 1986.
INTEREST—M&S1 at office of trustee or Morgan Guaranty Trust Co., New York.
TRUSTEE—Texas Commerce Bank N.A., Houston.
DENOMINATION—Coupon, $1,000; registerable as to principal; fully registered, $1,000 and authorized multiples thereof.
CALLABLE—As a whole or in part on [illegible] days' notice at any time to the last day of each Feb., incl., as follows:

1981	100.72	1982	100.58	1983	[illegible]
1984	100.29	1985	100.15	1986	[illegible]

Also callable on like notice as above for sinking or improvement fund (which see), or replacement fund, or with certain deposited cash, at special prices to the last day of each Feb., incl., as follows:

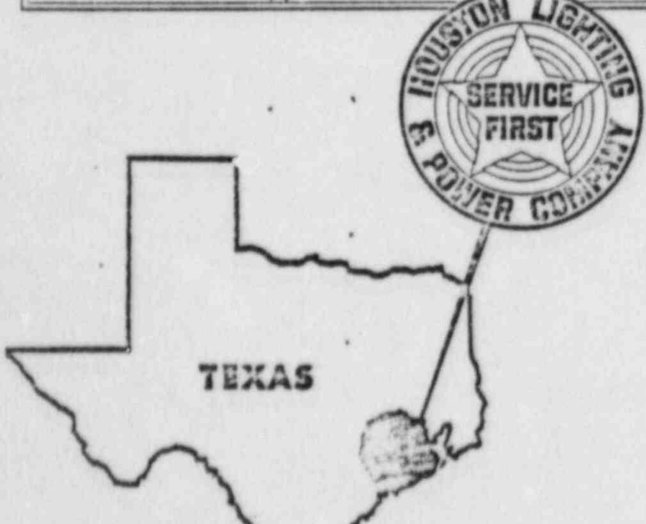
1981	100.33	1982	100.28	1983	[illegible]
1984	100.18	1985	100.12	1986	[illegible]

SINKING OR IMPROVEMENT FUND—Annually, beginning 1959, in cash or 1986 series bonds, or with property additions at 60%, equal to 1% of maximum 1986 series bonds at any one time outstanding, less certain bonds retired. Requirement may not be anticipated.
REPLACEMENT FUND—Same as for first 3s, due 1989.
SECURITY, OTHER PROVISIONS—Same as for first 3s due 1989.
PURPOSE—Proceeds used to repay bank loans; for construction and other corporate purposes.
OFFERED—($30,000,000) at 101.153 (proceeds to company 100.604) on Mar. 8, 1956 by Halsey, Stuart & Co., Inc., Chicago and associates.

4. Houston Lighting & Power Co. first 4¾s, due 1987:

Rating—A 1

AUTHORIZED—Unlimited; outstanding, 1987 series, Dec. 31, 1981, $40,000,000.
DATED—Nov. 1, 1957.
MATURITY—Nov. 1, 1987.
INTEREST—M&N 1 at office of trustee or Morgan Guaranty Trust Co., New York or Halsey Stuart & Co., Inc., Chicago.
TRUSTEE—Texas Commerce Bank N.A., Houston.
DENOMINATION—Coupon, $1,000; registerable as to principal; fully registered, $1,000, $10,000 and authorized multiples of $1,000. C&R interchangeable.
CALLABLE—As a whole or in part, on [illegible] days' notice at any time to Oct. 31 incl. as follows:



SYSTEM MAP
HOUSTON LIGHTING
& POWER COMPANY

345 kv lines ☐ Switch Racks
138 kv lines △ Generating Plants
69 kv lines ◘ Substations

OCT 2 1 1981

AIF

Electricity from Nuclear Power

A 1981 map of Nuclear Power Plants in the U.S.

INFO

Atomic Industrial Forum, Inc.
7101 Wisconsin Avenue
Bethesda, MD 20814
Telephone: (301) 654-9260

State and Utility	Plant	Location	Net MWe	Type/Mfr.	Comm'l Operation
SOUTH CAROLINA					
Carolina Power & Light Co.	**H.B. Robinson 2**	**Hartsville**	**700**	**PWR/W**	**3/71**
Duke Power Co.	**Oconee 1**	**Lake Keowee**	**860**	**PWR/B&W**	**7/73**
Duke Power Co.	**Oconee 2**	**Lake Keowee**	**860**	**PWR/B&W**	**9/74**
Duke Power Co.	**Oconee 3**	**Lake Keowee**	**860**	**PWR/B&W**	**12/74**
Duke Power Co.	Catawba 1 (C)	York County	1,145	PWR/W	3/84
Duke Power Co.	Catawba 2 (C)	York County	1,145	PWR/W	9/85
Duke Power Co.	Cherokee 1 (C)	Cherokee County	1,280	PWR/CE	*
Duke Power Co.	Cherokee 2 (C)	Cherokee County	1,280	PWR/CE	*
Duke Power Co.	Cherokee 3 (C)	Cherokee County	1,280	PWR/CE	*
South Carolina Electric & Gas Co. (South Carolina Public Service Authority)	Virgil C. Summer 1 (C)	Parr	900	PWR/W	6/82
TENNESSEE					
Tennessee Valley Authority	**Sequoyah 1**	**Daisy**	**1,148**	**PWR/W**	**7/81[a]**
Tennessee Valley Authority	Sequoyah 2 (C)	Daisy	1,148	PWR/W	7/82
Tennessee Valley Authority	Watts Bar 1 (C)	Spring City	1,177	PWR/W	1/84
Tennessee Valley Authority	Watts Bar 2 (C)	Spring City	1,177	PWR/W	10/84
Tennessee Valley Authority	Hartsville A-1 (C)	Hartsville	1,233	BWR/GE	7/88
Tennessee Valley Authority	Hartsville A-2 (C)	Hartsville	1,233	BWR/GE	4/89
Tennessee Valley Authority	Hartsville B-1 (C)	Hartsville	1,233	BWR/GE	*
Tennessee Valley Authority	Hartsville B-2 (C)	Hartsville	1,233	BWR/GE	*
Tennessee Valley Authority	Phipps Bend 1 (C)	Surgoinsville	1,233	BWR/GE	2/89
Tennessee Valley Authority	Phipps Bend 2 (C)	Surgoinsville	1,233	BWR/GE	*
Tennessee Valley Authority (Commonwealth Edison Co., U.S. Department of Energy)	Clinch River Breeder Reactor Plant (O)	Oak Ridge	350	LMFBR/W	9/89[b]
TEXAS					
Houston Lighting & Power Co.	Allens Creek 1 (O)	Wallis	1,200	BWR/GE	0/91
South Texas Project [Houston Lighting & Power Co. (project manager), Central Power and Light Co., City Public Service Board of San Antonio, City of Austin]	South Texas Project 1 (C)	Matagorda County	1,250	PWR/W	2/84
South Texas Project [Houston Lighting & Power Co. (project manager), Central Power and Light Co., City Public Service Board of San Antonio, City of Austin]	South Texas Project 2 (C)	Matagorda County	1,250	PWR/W	2/86
Texas Utilities Generating Co. [Dallas Power & Light Co., Texas Electric Service Co., Texas Power & Light Co., Texas Municipal Power Agency, Brazos Electric Power Coop., Inc., Tex-La Electric Coop. of Texas, Inc.]	Comanche Peak 1 (C)	Somervell County	1,150	PWR/W	0/82
Texas Utilities Generating Co. [Dallas Power & Light Co., Texas Electric Service Co., Texas Power & Light Co., Texas Municipal Power Agency, Brazos Electric Power Coop., Inc., Tex-La Electric Coop. of Texas, Inc.]	Comanche Peak 2 (C)	Somervell County	1,150	PWR/W	0/84
VERMONT					
Vermont Yankee Nuclear Power Corp.	**Vermont Yankee**	**Vernon**	**514**	**BWR/GE**	**11/72**
VIRGINIA					
Virginia Electric and Power Co.	**Surry 1**	**Gravel Neck**	**775**	**PWR/W**	**12/72**
Virginia Electric and Power Co.	**Surry 2**	**Gravel Neck**	**775**	**PWR/W**	**5/73**
Virginia Electric and Power Co.	**North Anna 1**	**Mineral**	**865**	**PWR/W**	**6/78**
Virginia Electric and Power Co.	**North Anna 2**	**Mineral**	**890**	**PWR/W**	**12/80**
Virginia Electric and Power Co.	North Anna 3 (C)	Mineral	907	PWR/B&W	0/89

[a] Received full-power operating license 9/16/80 and is expected to go into commercial operation 7/81
[b] Subject to resolution of national policy debate

NOV 1 5 1982

Licensing Tracking System for Nuclear Power Plants

October 1982 Status Report

UDI

Utility Data Institute, Inc.
2011 I Street, NW
Suite 700
Washington, DC 20006

TABLE 6

NUCLEAR LICENSING SCHEDULES
BEYOND 1985

CLASS: 1986

PLANT	STATE	MW	CP ISSUE	MOS SINCE CP ISSUE	EST MOS TO OPERATION	APPLICANT EST CONST COMPLETE	DURATION CP ISSUE TO FULL POWER
BELLEFONTE 2	AL	1235	12/74	94	43	5/86	137
BRAIDWOOD 2	IL	1120	12/75	82	42	4/86	124
CATAWBA 2	SC	1145	8/75	86	48	10/86	134
HOPE CREEK 1	NJ	1067	11/74	95	44	6/86	139
MARBLE HILL 1	IN	1130	4/78	54	44	5/86	98
NINE MILE POINT 2	NY	1080	6/74	100	41	3/86	141
SEABROOK 2	NH	1198	7/76	75	40	2/86	115
SOUTH TEXAS 1	TX	1250	12/75	82	50	12/86	132
VOGTLE 1	GA	1100	6/74	100	47	9/86	147
WPPSS 3	WA	1242	4/78	54	44	6/86	98
TOTALS FOR 1986							
10 Plants		11567		822	443		1265

OCT 1982

TABLE 6

NUCLEAR LICENSING SCHEDULES
BEYOND 1985

CLASS: 1988

PLANT	STATE	MW	CP ISSUE	MOS SINCE CP ISSUE	EST MOS TO OPERATION	APPLICANT EST CONST COMPLETE	DURATION CP ISSUE TO FULL POWER
PERRY 2	OH	1205	5/77	65	67	5/88	132
SHEARON HARRIS 2	NC	915	1/78	57	68	6/88	125
SOUTH TEXAS 2	TX	1250	12/75	82	74	12/88	156
VOGTLE 2	GA	1100	6/74	100	65	3/88	165
TOTALS FOR 1988 4 Plants		4470		304	274		578

SECURITIES AND EXCHANGE COMMISSION
Washington, D.C. 20549

FORM 10-K

ANNUAL REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934

FOR THE FISCAL YEAR ENDED DECEMBER 31, 1980. COMMISSION FILE NO. 1-3187H-1

HOUSTON LIGHTING & POWER COMPANY

(Exact name of registrant as specified in its charter)

Texas (State or other jurisdiction of incorporation or organization)	74-0694415 (I.R.S. Employer Identification No.)
611 Walker Avenue Houston, Texas (Address of principal executive offices)	77002 (Zip Code)

Registrant's telephone number, including area code (713) 228-9211.

Securities registered pursuant to Section 12(b) of the Act:

Title of each class	Name of each exchange on which registered
5½% Convertible Debentures due 1985	New York Stock Exchange

Securities registered pursuant to Section 12(g) of the Act:

Preferred Stock, cumulative, no par:

$4 Series, $6.72 Series, $7.52 Series, $9.52 Series, $9.08 Series, $8.12 Series and $9.04 Series
(Title of class)

Indicate by check mark whether the registrant (1) has filed all reports required to be filed by Section 13 or 15(d) of the Securities Exchange Act of 1934 during the preceding 12 months (or for such shorter period that the registrant was required to file such reports), and (2) has been subject to such filing requirements for the past 90 days. Yes √ No .

As of March 16, 1981, 45,974,649 shares of the registrant's Common Stock, without par value, were issued and outstanding and privately held, beneficially and of record, by Houston Industries Incorporated.

The definitive proxy statement relating to the 1981 Annual Meeting of Shareholders of Houston Industries Incorporated, the registrant's parent, is incorporated by reference in Item 9 and Item 10 of Part III of this form.

HOUSTON LIGHTING & POWER COMPANY

Form 10-K for the Year Ended December 31, 1980

Table of Contents

PART I

Item 1. *Business.*

The Company

Houston Lighting & Power Company (HL&P) is engaged in the generation, transmission, distribution and sale of electric energy, serving an area of the Texas Gulf Coast Region, estimated at 5,000 square miles, in which are located Houston (the largest city in Texas) and 157 smaller cities, villages and communities. The address of the Company's principal executive offices is 611 Walker Avenue, Houston, Texas 77002 (telephone number 713-228-9211).

HL&P is a subsidiary of Houston Industries Incorporated (Houston Industries) which owns all of HL&P's outstanding common stock. Houston Industries is a holding company as defined in the Public Utility Holding Company Act, but is exempt from regulation as a "registered" holding company under that Act except with respect to the acquisition of securities of other public utility companies. The other subsidiaries of Houston Industries are Primary Fuels, Inc. and Utility Fuels, Inc. Primary Fuels participates in joint ventures that engage in oil and gas exploration, development and production activities offshore Texas and Louisiana and onshore within the continental United States. Such ventures are not presently regarded as potential sources of fuel for HL&P's utility operations. Utility Fuels provides coal and lignite supply services to HL&P. See "Fuel – Coal and Lignite Supply".

Certain Factors Affecting Electric Utilities

HL&P, in common with electric utilities in general, has experienced problems in a number of areas, including difficulty in securing timely rate increases in sufficient amounts to finance its construction program and provide an adequate return on common equity, increased cost of fuel, substantial increases in construction and operating costs, greater reliance on fuels other than natural gas, increased expenditures due to pollution control and environmental considerations, uncertainties and delays respecting the licensing and construction of nuclear and fossil fueled generating units resulting in the need to purchase power from other electric utility systems, high costs in raising large amounts of capital in competition with other major users of capital, and an unpredictable rate of growth of energy sales due to weather, uncertain economic conditions and energy conservation measures by customers. As discussed herein, certain of these problems have had and are expected to have an impact on HL&P's operations. See "Construction Program", "Peak Loads and Capability" and Item 7, "Management's Discussion and Analysis of Financial Condition and Results of Operations".

In November 1978, federal energy legislation was enacted which was designed to achieve, through various regulatory provisions, the conservation of energy and the development and use of more plentiful domestic fuels. As discussed herein (see "Fuel – General"), the portion of such National Energy Act known as the Power Plant and Industrial Fuel Use Act of 1978 imposes restrictions on the use of natural gas or oil as fuel in certain industrial and utility facilities and, if strictly enforced, will adversely affect HL&P and its service area. Other provisions of the National Energy Act provide for the establishment of federal electric rate design standards and federal authority to order interconnections and wheeling of power under specified circumstances. Because of their complexity and uncertainties in their interpretation and implementation, the effect on HL&P of these other provisions cannot be predicted.

During 1977, federal legislation was enacted which provided for regulation of, among other things, construction which results in new sources of emission in clean air attainment areas, control technologies for the limitation and removal of plant emissions, and the imposition of penalties for not complying with air quality control standards commensurate with the economic value of noncompliance. The implementation of this legislation has significantly increased HL&P's construction costs, will increase its future operating costs and may reduce the rate of industrial expansion in HL&P's service area. See "Construction Program" and "Regulatory Matters – Environmental Quality".

Service Area and Franchises

HL&P's service area includes major producers of oil, gas, sulphur, refined products, chemicals, petrochemicals, steel, oil tools and related manufacturing, processing and servicing activities. It is characterized by a favorable year-round climate and ready access to air, land and water transportation. Electronics, paper, cement, building materials, cotton, rice, cattle, salt, magnesium and other minerals are also important products of the service area.

Expansion of industrial activity in HL&P's service area has been accompanied by a corresponding increase in the construction of industrial structures and complexes and building activity in many other fields including multi-block office building complexes, apartment buildings, single and multi-family dwellings, hotels and motels, hospitals and other commercial structures.

HL&P operates in the City of Houston under a franchise which expires in October 2007. Franchises granted by other incorporated municipalities expire in 2007 or in later years.

Construction Program

HL&P has a continuing program of major construction to provide facilities to meet increased customer demands and utilize more plentiful domestic fuels. As described below, HL&P recently completed a reassessment of its construction program as a result of substantial increases in cost estimates and the related difficulties it and its parent, Houston Industries, could expect to encounter in raising large amounts of capital to finance its construction activities. Based on such reassessment, the program for the three-year period 1981-1983 is currently estimated to cost $2.4 billion, with $691 million to be spent in 1981, $759 million to be spent in 1982 and $947 million to be spent in 1983. The new three-year program (exclusive of allowance for funds used during construction and payments for nuclear fuel) consists of the following principal items:

	Amount	%
Fossil-fueled generating facilities	$ 886,000,000	37
Nuclear-fueled generating facilities	609,000,000	25
Transmission facilities	281,000,000	12
Distribution facilities	457,000,000	19
General plant facilities	164,000,000	7
Total	$2,397,000,000	100

At December 31, 1980 HL&P owned and operated generating facilities with an aggregate name-plate capacity of 11,607,502 kilowatts. The 1981-1983 construction program includes expenditures in connection with the following major generating projects aggregating 5,450,000 kilowatts of capacity.

				Millions of Dollars		
Plant and Location (County)	Estimated Unit Capacity (KW)	Fuel	Scheduled In-Service Date(a)	Expenditures Through December 31, 1980	Estimated Completed Cost	Estimated Cost per KW
W. A. Parish No. 8 (Fort Bend)	600,000	Coal	1983	$147	$ 408	$ 680
South Texas No. 1 (Matagorda)(b)	385,000	Nuclear	See Note (b) below			
South Texas No. 2 (Matagorda)(b)	385,000	Nuclear				
Limestone No. 1 (Limestone)	750,000	Lignite	1987	56	1,600	1,067
Limestone No. 2 (Limestone)	750,000	Lignite	1988			
To be determined No. 1(c)	690,000	Lignite	1989	1	1,870	1,355
To be determined No. 2(c)	690,000	Lignite	1990			
Allens Creek (Austin)	1,200,000	Nuclear	1991	249	2,090	1,742

(See notes on following page)

(a) The scheduled in-service date indicates the year the unit is expected to be available to meet peak demand.

(b) The capacity for each of the South Texas nuclear units represents HL&P's 30.8% share of a 2.5 million kilowatt project which is jointly owned with the Cities of Austin and San Antonio and Central Power and Light Company. As approved by all participants in the project in late 1979, the scheduled in-service dates for the two units are 1984 and 1986, respectively, with HL&P's share of the total estimated completed cost for both units being $832 million or $1,080 per kilowatt. These figures do not give effect to significant developments during 1980 described below under "Matters Affecting Nuclear Construction" which are expected to adversely affect the scheduled in-service dates and completed cost for the project. Through December 31, 1980, HL&P had spent approximately $450 million on its share of the project.

(c) Selection of a site for these units is dependent upon HL&P's ability to obtain a long-term fuel supply.

The foregoing amounts do not include estimates of the allowance for funds used during construction or nuclear fuel expenditures. Through December 31, 1980, HL&P had spent $98 million for uranium concentrate and nuclear fuel processing services, including $39 million for its share of the fuel for the South Texas units. It expects to spend $60 million for such purposes during the 1981-1983 period. Additional nuclear fuel expenditures, which could include substantial sums for long-term storage of spent nuclear fuel, will be required after 1983. During the 1981-1983 period, Utility Fuels, a subsidiary of Houston Industries which provides coal and lignite supply services to HL&P, expects to acquire additional railroad cars and coal handling facilities costing $79 million (a portion of which is expected to be financed through leveraged lease arrangements) in order to be able to meet the increased coal delivery requirements of HL&P's W. A. Parish Plant. Utility Fuels expects to spend an additional $11 million during the same period for transportation equipment and lignite mining and handling facilities for the Limestone plant.

Actual construction expenditures will vary from the above estimates as a result of numerous factors, including continuing inflation at an annual rate in excess of 10%, changes in equipment delivery schedules, construction delays, availability of fuel, environmental protection expenditures, licensing delays, additional changes in the construction program, legislative changes and changes in customer demand and business conditions. A significant portion of HL&P's generating facilities in the early 1990's is scheduled to be natural gas and oil-fired, but enforcement of the federal Fuel Use Act could require HL&P to supplement, convert or replace such generating capacity earlier than presently planned.

Federal and state action to protect the environment may also materially affect the current esimates of future construction expenditures. Expenditures for environmental protection facilities for the five years ended December 31, 1980 aggregated $104 million, including expenditures of $27 million in 1980. Environmental protection expenditures for 1981-1983 are estimated to be $212 million, of which $60 million is expected to be expended during 1981, $54 million during 1982 and $98 million in 1983. Because of uncertainties surrounding the disposal or long-term storage of spent nuclear fuel, fuel costs associated with the continuing operation of nuclear units could be substantial.

Total gross additions to the plant of HL&P during the five years ended December 31, 1980 amounted to $2.5 billion and during the same period retirements amounted to $86 million. Gross additions during the period amounted to approximately 55% of total utility plant at December 31, 1980.

HL&P's construction program for the 1981-1983 period previously contemplated expenditures totaling $3.3 billion, with $761 million to be spent in 1981, $1.044 billion to be spent in 1982 and $1.494 billion to be spent in 1983. The revised program provides for a two-year delay in the completion of each of the four lignite units and the Allens Creek nuclear unit with the result that estimated construction expenditures have been reduced by $70 million in 1981, $285 million in 1982 and $547 million in 1983. Utility Fuels' estimated expenditures in connection with the Limestone units were reduced by \$99 million from the previous estimate of \$110 million for the same three-year period. The delayed in-service dates have also resulted, however, in increases in estimated completed costs of \$159 million for the two Limestone lignite units, \$382 million for the two lignite units at the site which has yet to be determined and \$230 million for the Allens Creek nuclear plant. In addition, as discussed below under "Peak Loads and Capability", the planned delays for bringing these five units into service will require HL&P to contract for additional quantities of purchased power and to implement additional load management and conservation measures in order to be able to maintain adequate reserve margins in the mid and late 1980's.

In the reassessment of the construction program as previously scheduled, particular attention was given to the need to alleviate the anticipated difficulties of financing the program during periods when other major users of capital would also be seeking substantial external funds. Even assuming that HL&P could continue to obtain rate relief on a timely basis at a level comparable to that most recently granted to it by the Texas Public Utility Commission, approximately 70% to 75% of the previous 1981-1983 construction budget would have had to be financed from external sources. Principally because of these capital requirements, Moody's Investors Service, Inc. lowered its rating of HL&P's First Mortgage Bonds and Preferred Stock in November 1980 from "Aa" to "A" and from "aa" to "a", respectively. Such securities continue to be rated "double A" or equivalent by Standard & Poor's Corporation and Fitch Investor's Service, Inc. Under the revised program, it is expected that approximately 65% to 70% of the 1981-1983 budget will still have to be financed from external sources, assuming HL&P can obtain adequate and timely rate relief.

Matters Affecting Nuclear Construction. Throughout most of 1980, certain major construction activities on the South Texas project, principally complex concrete pouring and safety-related welding, were voluntarily suspended pending an evaluation by HL&P (which is the project manager) and the principal contractor of irregularities in some of the work previously performed. During such suspension, the Nuclear Regulatory Commission (NRC) found various procedural deficiencies in the project's quality assurance and quality control programs, fined HL&P \$100,000 (the maximum permitted under applicable law) and ordered HL&P to show cause why safety-related construction activities on the project should not be stopped until specified steps have been taken to assure the NRC that the programs for quality assurance and quality control meet NRC standards and that the procedural deficiencies identified by the NRC have been corrected. In July 1980, HL&P submitted to the NRC detailed plans for improving the quality assurance program and for correcting such deficiencies. In November 1980 and January 1981, respectively, the NRC authorized full resumption of structural welding and limited resumption of complex concrete pouring and safety-related pipe welding. HL&P is unable to predict when all major construction activities on the project can be fully resumed; however, if such activities continue to be limited or curtailed for a protracted period of time, HL&P's earning power, reliability of service and ability to finance its other construction projects will be adversely affected. In connection with the application to the NRC for operating licenses for each of the generating units in the project, it is anticipated that hearings will be conducted during 1981 to consider, among other things, whether the findings by the NRC as to the adequacy of the project's previous quality assurance and quality control programs affect HL&P's qualifications to become a licensee.

In February 1980, an independent engineering firm recommended that the commercial operation date of each unit in the South Texas project be extended by six months, that the total size of the work force on the project be expanded, that multi-shift overtime work programs be utilized, and that \$136 million (\$42 million for the account of HL&P) be added to the allowances for contingencies. Such report was based on the status of the project prior to the suspensions described above.

The scheduled in-service dates and estimated completed costs set forth in Note (b) to the construction table do not reflect the delays expected to be experienced or substantial additional cost expected to be incurred on the basis of the matters discussed in the two preceding paragraphs. The extent to which such dates and costs have been affected by these developments must be determined jointly by all participants in the project following a comprehensive engineering and financial review which is expected to be completed in mid-1981. The existing construction permits for the two units in the South Texas project are scheduled to expire in May 1982 and October 1983, respectively. In order to complete construction of the project, it will be necessary to obtain authorization of the NRC for extension of such permits.

Completion of construction of the Allens Creek nuclear unit as shown in the table is dependent upon the issuance of a construction permit by the NRC by mid 1982. Based on current concerns relating to safety and siting of nuclear power plants and the activities of citizens and environmental groups that have intervened in opposition to the project, there can be no assurance that such permit can be obtained.

Financing of Construction Program. HL&P proposes to finance its construction program through the use of internally generated funds and the proceeds received from the issuance of securities including, on an interim basis, short-term debt. Except for $125 million of 13⅞% First Mortgage Bonds due February 1, 1991 which were sold by HL&P in February 1981 and 3,000,000 shares of Common Stock sold by Houston Industries in March 1981 (resulting in total net proceeds of approximately $196 million), the types, amounts and time of issuance of such securities have not yet been determined. HL&P's ability to provide internally generated funds for, and thereby continue with, its presently proposed construction program will be dependent upon its ability to obtain adequate and timely rate relief. See "Regulatory Matters – Rates and Services".

Peak Loads and Capability

The following table sets forth information with respect to the installed net capability of HL&P at the time of peak demand, the net maximum hourly demand on the system (excluding demand which is interruptible), and the reserve margin at the time of its system net maximum hourly demand:

		Net Maximum Hourly Demand			
Year	Installed Net Capability (Megawatts)	Date	Megawatts	% Increase Over Prior Year	Reserve Margin (%)
1976	9,810	August 9	8,019	10.6	22.3
1977	10,170	July 25	8,445	5.3	20.4
1978	10,828	July 18	9,114	7.9	18.8
1979	11,193	August 2	9,336	2.4	19.9
1980	11,763	August 22	10,266	10.0	14.6

The net capability and reserve margins presented above do not reflect additional firm capability available through interconnections with other utility systems. Although historically such interconnections were maintained principally for the purpose of meeting emergency conditions, they are now also used for HL&P's supplemental power needs discussed below. The substantial increase in peak demand in 1980 over 1979 reflects the record high temperatures experienced in the HL&P service area in 1980 as compared to the relatively mild summer of 1979.

In conjunction with its decision to extend the scheduled in-service dates for the four lignite units and the Allens Creek nuclear plant (see "Construction Program" above), HL&P is actively pursuing comprehensive load management measures. A program to reduce system voltage during periods of emergencies is under development and rate studies designed to encourage industrial customers to reduce their demands during periods of peak system loads are being conducted.

It is presently estimated that HL&P's compound growth rate in peak demand for the five-year period 1981-1985 will be approximately 3% to 4%. The current estimate is derived from a continuing survey of industrial customers which reflects expectations for power consumption, assessment of the effect of additional residential customers on peak demands, the prospect of more intensive energy conservation measures by all classes of customers, and assumptions as to the effectiveness of the load management program discussed above. HL&P has contracted with the City of Austin, Texas to purchase up to 800 megawatts of Austin's generating capacity through 1987. HL&P has also contracted with the City Public Service Board of San Antonio to purchase varying amounts of capacity during the years 1982 through 1987, ranging from 200 to 500 megawatts. Performance of these contracts is subject to, among other things, fuel limitations that may be imposed on Austin, San Antonio or their fuel suppliers. In the event of fuel limitations, HL&P will be entitled to arrange for delivery of natural gas from its own suppliers to Austin or San Antonio for use in providing such capacity. The terms of the contracts include fixed capacity charges for each year and variable charges for fuel and operation and maintenance expenses. HL&P expects to recover all fuel charges and a substantial portion of the operation and maintenance expenses through its fuel adjustment clauses. Capacity charges associated with 500 megawatts of the Austin contract are presently recoverable through base rates. Recovery of additional capacity charges will be requested in future rate proceedings.

Assuming it is able to purchase the supplemental capacity it has contracted for from Austin and San Antonio, HL&P expects to maintain a minimum reserve margin of at least 15% in excess of its current estimate of peak-load requirements through 1985. Up to 300 megawatts of additional supplemental capacity in 1986 and up to 500 megawatts in 1988 and 1989 will be required in order to maintain a reserve margin at or above 15% subsequent to 1985. No assurances can be given that additional power purchase contracts can be obtained or that, if obtained, they will be upon terms favorable to HL&P.

Fuel

General. Approximately 82% of HL&P's generating fuel requirements during 1980 was met with natural gas, 17% was met with coal and the balance was met with oil. Prior to 1979 substantially all of such requirements were met with natural gas. HL&P currently expects its future use of gas, oil, coal and lignite, and nuclear fuel in its own generating units to be in the following relative proportions:

	% of Generating Requirements				
	1981	1982	1983	1985	1990
Gas	83%	75%	76%	72%	55%
Oil	1	8	1	1	1
Coal and lignite	16	17	23	24	38
Nuclear	–	–	–	3	6
Total	100%	100%	100%	100%	100%

HL&P's actual fuel mix in future years could vary substantially from the percentages shown in the table. Such percentages are based upon numerous estimates and assumptions relating to, among other things, environmental protection requirements, load growth, the cost and availability of fuels, and scheduled in-service dates of its planned generating facilities. The percentages for 1990 are further based upon the assumption that the Power Plant and Industrial Fuel Use Act of 1978, which generally prohibits the use of oil or gas as a fuel for electric generation beginning in 1990, will be amended to allow the use of natural gas in existing generating units throughout their useful lives. If such Act is not so amended, it will have a material adverse effect upon HL&P and its service area.

Natural Gas Supply. HL&P purchases natural gas from Exxon Company, U.S.A. (Exxon) and United Texas Transmission Company (United) under three separate long-term contracts. The Exxon contract expires after delivery of a specified quantity of gas, but in no event later than December 31, 1996. The two contracts with United provide for delivery of a specified quantity of gas through 1989. Approximately 80% of the natural gas requirements presently contemplated through 1989 and 25% for 1990 are expected to be met through these two suppliers. HL&P is currently negotiating for additional natural gas supplies to meet its remaining natural gas requirements. Should HL&P be unable to contract for additional natural gas supplies through 1989, it has sufficient quantities of oil under contract to meet its remaining fuel requirements with respect to units which are normally gas-fired.

Gas deliveries by Exxon are being made from its reserves which have been dedicated to meet the requirements of HL&P during the term of the Exxon contract, while deliveries by United consist principally of gas purchased from unaffiliated suppliers. Under the priorities contained in a gas curtailment program approved by the Railroad Commission, deliveries by jurisdictional suppliers to customers such as HL&P must be curtailed before any curtailment of deliveries to other contract customers, exclusive of those served on an interruptible basis.

All of the natural gas being delivered to HL&P is intrastate gas. The Natural Gas Policy Act of 1978 has not adversely affected HL&P's supply of natural gas. HL&P cannot accurately predict the effect such Act may have on its future supply of natural gas. It appears that the phased price decontrol provisions of such Act have increased and will continue to increase the cost of natural gas to HL&P.

Oil Supply. As indicated above, HL&P expects to rely on oil in meeting a portion of its future generating fuel requirements. HL&P has storage facilities for 6,700,000 barrels of oil and has installed a pipeline system linking most of its major power plants to provide for distribution of oil to those units capable of using oil. There is sufficient oil presently on hand to permit the exclusive use of oil for 17 days in those units that are capable of burning oil on a continuous basis. HL&P has a contract with Exxon under which it is entitled to purchase sufficient quantities of oil to satisfy substantially all of its presently anticipated oil requirements through 1989. However, the contract may be re-opened once at any time at the election of either party and if agreement on new terms cannot be reached after such a re-opening, the contract may be cancelled at the election of either party. The contract is also subject to re-negotiation and cancellation in the event of material changes in existing laws and regulations affecting fuel oil. The contract provides for deliveries of oil having a maximum sulphur content which is less than that permitted under current air quality standards for oil-burning generating units. Deliveries are made through an Exxon pipeline from its Baytown, Texas refinery directly to HL&P's oil pipeline facilities.

If oil instead of gas were to be burned in all of HL&P's units capable of continuous use of either fuel, such equipment's generating capacity would be reduced by 3%. In addition, it is anticipated that increased costs will be incurred for repair and maintenance, as well as for operation in a manner that insures compliance with applicable air quality control requirements, when oil instead of gas is used as boiler fuel. See "Regulatory Matters – Environmental Quality" below.

Coal and Lignite Supply. It is estimated that the three coal-fired generating units now in operation at HL&P's W. A. Parish plant and the additional coal-fired unit being constructed at that location (see "Construction Program") will require an aggregate of 200 million tons of low-sulphur Western coal for the first 25 years of operation of each unit. The actual amount of coal used will depend on, among other things, its heat content. Coal supply services for the W. A. Parish plant are being provided by Utility Fuels, another subsidiary of Houston Industries. Utility Fuels is presently purchasing Wyoming coal from Kerr-McGee Coal Corporation (Kerr-McGee) and Montana coal from Spring Creek Coal Company (Spring Creek), under long-term coal supply contracts. Substantially all of the coal requirements of HL&P's W. A. Parish coal units are expected to be met under such contracts, which provide for deliveries of coal having a relatively low sulphur content. See "Regulatory Matters – Environmental Quality". The cost of the coal under both agreements is governed by formulas containing various escalation provisions relating to changes in specified costs and cost indices. A major component of the delivered cost is the railroad charge for transporting the coal from surface mines in Wyoming and Montana operated by Kerr-McGee and Spring Creek. Such mines are 1,700 railroad miles from Houston. The Interstate Commerce Commission (ICC) currently authorizes a railroad charge for the Wyoming coal of $21.70 per ton and Montana coal of $22.73 per ton in contrast to the cost per ton of coal which is approximately half the cost of such rail charges.

In August 1979, HL&P acquired lignite leases located in the Texas counties of Limestone, Leon and Freestone, and Utility Fuels contracted with Northwestern Resources Co. (NWR) for an additional supply of lignite located in the same counties. The estimated recoverable lignite represented by HL&P's leases and those dedicated under the NWR contract are expected to meet 65% to 75% of the total fuel requirements of the Limestone Electric Generating Station. Total fuel requirements for the first 30 years of operation are 240 million tons of lignite. NWR and Utility Fuels are currently negotiating for additional lignite reserves needed to meet the remaining fuel requirements of the plant.

Additional long-term commitments for coal and for lignite are being sought. Federal legislation enacted in 1977 relating to surface mining and mine safety could adversely affect the availability of coal and lignite under any future contracts. The legislation has not affected, and is not expected to affect, the availability of coal presently under contract, but has resulted in increases in cost. The operating and maintenance expenses for coal and lignite-fired units are substantially higher than those for HL&P's gas-fired units.

Nuclear Fuel Supply. Generally, the supply of fuel for nuclear generating facilities involves the acquisition of uranium concentrate, its conversion to uranium hexafluoride, enrichment of gaseous uranium hexafluoride, and fabrication of nuclear fuel assemblies. Following use of the nuclear fuel assemblies, they must either be disposed of or shipped and reprocessed for reuse.

Westinghouse Electric Corporation has contracted to provide the South Texas nuclear units with up to 9,377,000 pounds of uranium concentrate which, together with a minimum of 5,600,000 pounds to be provided by another supplier, is expected to satisfy the fuel requirements for the first 14 years of operation of each unit. Westinghouse has also contracted to furnish fuel fabrication services for the initial core and 16 years of reloads for each unit, certain additional services and equipment, and additional concentrate subject to the development of additional uranium reserves. Contracts with Westinghouse and others provide for conversion services for the South Texas units through 1988 and for enrichment services for a period of up to 30 years.

Contracts have been concluded for HL&P's proposed Allens Creek nuclear plant which provide for uranium concentrate in sufficient quantities to supply the initial core, for conversion services for the initial core, for enrichment services for a period of up to 30 years, and for fabrication of the nuclear fuel assemblies to be used in the initial core and one year of fuel reloads. HL&P is currently seeking other long-term arrangements for uranium concentrate and for additional nuclear fuel components and services that will be required for the Allens Creek facility.

As part of current federal energy policy, reprocessing of spent nuclear fuel has been indefinitely deferred. If the fuel discharged from the South Texas and Allens Creek units cannot be reprocessed, it must eventually be placed into long-term off-site storage. The South Texas and Allens Creek plants will have on-site storage facilities with the capacity to store approximately ten years of spent fuel discharged from each unit. HL&P cannot predict the extent to which the indefinite deferral of reprocessing will increase the cost of and demand for uranium concentrate.

Cost of Fuel. The cost of fuel to HL&P has increased substantially over the past three years. See "Operating Statistics" and Item 8, "Financial Statements and Supplementary Data". The unit cost of coal includes the actual cost of the coal delivered to the boiler as well as a carrying charge for inventory and the use of related facilities. HL&P is unable to accurately estimate its future cost of fuel, but expects that it will continue to increase. Substantially all of the increases in costs for fuel are presently covered by fuel adjustment clauses contained in HL&P's rate tariffs. However, recent rate orders have limited the recovery of a portion of the carrying charge referred to above with respect to coal.

Regulatory Matters

Rates and Services. Prior to 1976, HL&P's general rate levels were based on ordinances of the City of Houston and the other incorporated municipalities in HL&P's service area. In September 1976, pursuant to the Texas Public Utility Regulatory Act passed in June 1975, the Public Utility Commission of Texas (Utility Commission) assumed original jurisdiction over electric rates and services in unincorporated areas of the State (which accounted for 46% of HL&P's operating revenues and 53% of KWH sales for the twelve months ended December 31, 1980) and appellate jurisdiction over electric rates and services within incorporated municipalities.

In November 1978, following HL&P's request for a rate increase of 12.6% for an adjusted test year ended March 31, 1978, the Utility Commission granted an increase of 7%. In January 1980, following HL&P's request in July 1979 for a rate increase of $179 million or 10.5% for an adjusted test year ended March 31, 1979, the Utility Commission issued an order granting HL&P an increase of $82 million or 4.9%. In the January 1980 order, the Utility Commission included $454 million or 60% of construction work in progress and nuclear fuel in process in HL&P's rate base, while only $179 million or 40% of such items was included in the rate base in the Utility Commission's 1978 order. HL&P requested inclusion of 100% of these items for both test years.

On September 15, 1980, the Utility Commission granted an increase of $135 million or 6.3% for an adjusted test year ended March 31, 1980. HL&P had requested $214 million which represented a 10% increase. The final order issued by the Utility Commission was based upon a settlement agreement entered into by HL&P, the Utility Commission and the major intervenors in the case. The final order provided for the inclusion of $677 million or 72% of construction work in progress and nuclear fuel in process in rate base and granted a 15.8% return on common equity. The Company had requested 85% of construction work in progress and nuclear fuel in process in the rate base.

HL&P's actual returns on common equity have been somewhat lower than those granted in the Utility Commission's rate orders. See Item 7, "Management's Discussion and Analysis of Financial Condition and Results of Operations."

The City of Houston and certain other incorporated municipalities within HL&P's service area attempted to grant rate increases which were lower than the increases authorized by the Utility Commission. Following appeals from the municipal rate orders, the Utility Commission permitted HL&P, pending final disposition of such appeals, to set rates in the incorporated areas on an interim basis at the same level permitted for unincorporated areas. HL&P expects to seek another general rate increase prior to the end of 1981 and may be required to seek general rate relief in the future on a more frequent basis.

Environmental Quality. HL&P is subject to regulation with respect to air and water quality, solid waste disposal and other environmental matters by various federal, state and local authorities. Environmental regulations continue to evolve as a result of regulatory response to new legislation, administrative actions, and judicial review and interpretation. As a result, the precise effect of existing and potential regulations upon existing and proposed facilities and operations cannot presently be determined. However, developments in these and other areas of regulation have in the past required HL&P to modify, supplement or replace equipment and facilities and may in the future delay or impede construction and operation of new facilities at costs which could be substantial.

The Texas Air Control Board (Air Board) has jurisdiction and enforcement power to determine the level of air contaminants emitted in the State of Texas. HL&P is of the opinion that its generating facilities currently in operation are in compliance with the Texas Clean Air Act and with the current rules and regulations adopted thereunder by the Air Board. HL&P is also of the opinion that units under construction will, when operational, comply with the current requirements of the Texas Clean Air Act and the Federal Clean Air Act as amended. The standards established by the Texas Clean Air Act and the rules of the Air Board are subject to modification by standards promulgated by the federal Environmental Protection Agency (EPA). Although HL&P believes that its existing facilities and the facilities under construction will comply or can be modified to comply with such standards, there can be no assurance that such will be the case without substantial expense. A substantial portion of the cost to be incurred in constructing the W. A. Parish No. 8 unit and the four planned lignite-fired generating units (see "Construction Program") is the cost of scrubbers to control emissions of sulphur dioxide and other pollutants. As a result of EPA new-source performance standards and restrictions on deterioration of air quality applicable to HL&P's service area, the rate of future growth in kilowatt-hour sales to industrial customers may be lower than in the past. See "Operating Statistics."

The Texas Department of Water Resources (TDWR) has jurisdiction over all water discharges in the State of Texas and is empowered to set water quality standards and issue permits required for water discharges which might affect the quality of Texas water. The EPA is authorized to set such standards and issue permits in respect of discharges into navigable streams. HL&P has obtained permits from both the TDWR and the EPA for all of its generating facilities currently in operation which require such permits. Applications for permits with respect to the facilities included in HL&P's construction program are being submitted as required.

HL&P is also subject to regulation by the TDWR and the EPA with respect to the handling and disposal of solid waste generated on-site. In 1980 the EPA promulgated a number of regulations under the Resource Conservation and Recovery Act to protect human health and the environment from the improper management of hazardous waste. Applications for hazardous waste permits have been submitted by HL&P for each generating station and other facilities.

Nuclear Licensing. HL&P is subject to licensing and regulation by the Nuclear Regulatory Commission (NRC) with respect to environmental, public health and safety aspects of the construction and operation of nuclear power plants. In its capacity as manager of the South Texas nuclear project, HL&P is constructing two nuclear generating units pursuant to construction permits issued by the NRC in December 1975. HL&P has submitted an application for an operating license for both South Texas units. In connection with such application, hearings are expected to be conducted in 1981 to consider, among other things, whether the findings by the NRC as to the adequacy of the project's quality assurance and quality control programs affect HL&P's qualifications to become a licensee. An operating license is not issuable by the NRC until construction is substantially complete.

An application for a construction permit for the Allen Creek unit is pending before the NRC. Hearings in connection with the environmental aspects of such construction permit commenced in January 1981 and are expected to be completed by mid-1981. See "Construction Program".

Executive Officers

Name	Age	Officer Since(1)	Business Experience 1976-1980 Position(s)	Terms
D. D. Jordan	48	1971	President and Chief Executive Officer and and Director(2)(3)	1977-
			President and Director	1976-1977
G. W. Opera, Jr.	54	1971	Executive Vice President and Director(3)	1976-
J. D. Cowart	55	1975	Group Vice President — Administrative	1978-
			Vice President — Administrative	1976-1978
H. R. Dean	54	1966	Group Vice President — Accounting and Finance and Director(3)	1978-
			Group Vice President and Comptroller and Director	1977-1978
			Group Vice President and Comptroller	1976-1977
K. R. Hinckley	59	1972	Group Vice President — Corporate Planning and Development	1980-
			Group Vice President — External Relations	1977-1980
			Group Vice President	1976-1977

(Continued on following page)

Name	Age	Officer Since(1)	Business Experience 1976-1980 Position(s)	Terms
A. R. Beavers	57	1978	Vice President – Purchasing and Services	1978-
			General Manager – Purchasing and Stores	1976-1978
R. L. Evans, Jr.	65	1971	Vice President – Energy Supply	1980-
			Vice President – Operations	1976-1980
J. H. Goldberg	49	1980(4)	Vice President – Nuclear Engineering and Construction	1980-
			Vice President & Deputy Director of Construction – Stone & Webster Engineering Corp.	1977-1980
			Chief Engineer for Engineering Mechanics – Stone & Webster Engineering Corp.	1976
R. M. McCuistion	64	1971	Vice President – Power System Development	1980-
			Vice President – Engineering	1976-1980
C. L. McNeese	67	1975	Vice President and Assistant to the President	1980-
			Vice President – Federal Relations	1978-1980
			Vice President – Public Affairs	1976-1978
D. E. Simmons	55	1972	Vice President – Engineering and Transmission and Distribution	1980-
			Vice President – Corporate Planning	1976-1980
D. D. Sykora	50	1977	Vice President – Customer and Public Relations	1980-
			Vice President – Customer Relations	1978-1980
			Vice President – Commercial	1977-1978
			General Manager – Marketing	1976-1977
E. A. Turner	53	1978	Vice President – Power Plant Engineering and Construction – Fossil Projects	1980-
			Vice President – Power Plant Construction and Technical Services	1978-1980
			General Manager – Transmission and Distribution	1976-1978
			General Manager – Power Plant Engineering and Construction	1976
J. R. Johnston	57	1979	Secretary and Treasurer	1979-
			Assistant Secretary and Assistant Treasurer	1976-1979
R. S. Letbetter	32	1978	Comptroller	1978-
			Assistant Comptroller	1977-1978
			Assistant Secretary and Assistant Treasurer	1976-1977

(1) Executive officers were elected April 23, 1980 to serve for one year and until their successors are duly elected and qualified.

(2) Member of the Executive Committee.

(3) Member of the Finance Committee.

(4) Elected September 22, 1980.

Operating Statistics

	Year Ended December 31, 1978	1979	1980
Electric Energy Generated and Purchased (Mkwh):			
Generated — Net Station Output	53,101,474	54,678,417	57,228,126
Purchased	222,670	377,387	720,293
Total	53,324,144	55,055,804	57,948,419
Company Use, Lost and Unaccounted for	2,857,928	2,512,650	2,951,893
Other	190,449	182,651	192,907
Energy Sold	50,275,767	52,360,503	54,803,619
Electric Sales (Mkwh):			
Residential	10,956,914	11,078,887	12,566,097
Commercial	8,568,636	8,813,791	9.324,496
Industrial	27,808,895	29,309,384	29,672,733
Street Lighting — Government and Municipal	103,049	106,848	91,307
Total	47,437,494	49,308,910	51,654,633
Other Electric Utilities	2,838,273	3,051,593	3,148,986
Total	50,275,767	52,360,503	54,803,619
Number of Customers (End of Period):			
Residential	778,850	849,319	909,016
Commercial	111,050	117,324	124,298
Industrial	1,522	1,572	1,633
Street Lighting — Government and Municipal	81	70	70
Total	891,503	968,285	1,035,017
Other Electric Utilities	6	6	6
Total	891,509	968,291	1,035,023
Operating Revenue (Thousands of Dollars):			
Residential	$ 367,730	$ 453,354	$ 628,599
Commercial	274,081	350,000	436,360
Industrial	593,251	790,715	951,546
Street Lighting — Government and Municipal	3,608	6,634	9,257
Other Electric Utilities	57,359	78,898	98,353
Total	1,296,029	1,679,601	2,124,115
Miscellaneous Electric Revenues	7,575	27,971	(158)
Total	$1,303,604	$1,707,572	$2,123,957
Installed Generating Capacity (Kw) (End of Period)	11,056,353	11,056,353	11,607,502
Costs of Fuel (Cents per Million Btu):			
Gas	124.3	166.3	205.5
Oil	196.9	187.0	270.1
Coal	208.7	218.1	204.5
Average	126.2	171.0	205.9

Item 2. *Properties.*

All of the electric generating stations and all other operating property of HL&P are located in the State of Texas. HL&P considers this property to be well maintained and in good operating condition.

Electric Generating Stations. HL&P has eleven electric generating stations (79 generating units) with an installed capacity of 11,607,502 Kw.

Substations. As of December 31, 1980, HL&P owned 186 major substations having a total installed rated transformer capacity of 45,219,234 Kva (exclusive of spare transformers).

Electric Lines. As of December 31, 1980, HL&P operated 23,566 miles of transmission and distribution lines, including 1,440 miles operated at 138,000 volts and 392 miles operated at 345,000 volts.

General Properties. HL&P own various properties which include a 27-story headquarters office building, division offices, service centers and other facilities used for general purposes.

Titles. The electric generating plants and other important units of property of HL&P are situated on lands owned in fee by HL&P. Transmission lines and distribution systems have been constructed in part on or across privately owned land pursuant to easements or on streets and highways and across waterways pursuant to authority granted by municipal and county permits and by permits issued by state and federal governmental authorities. Under the laws of the State of Texas, HL&P has the right of eminent domain, whereby it may secure or perfect rights-of-way over private property, if necessary.

The major properties of HL&P are subject to liens securing their long-term debt and titles to some of their properties are subject to minor encumbrances and defects, none of which impair the use of the property in the operation of its business.

See Item 1, "Business".

Item 3. *Legal Proceedings.*

Controversy With Central and South West Corporation

In January 1976, the Securities and Exchange Commission (SEC) initiated proceedings under the Public Utility Holding Company Act for purposes of considering whether Central and South West Corporation (CSW), a registered holding company, is or can become a single integrated and coordinated system as required by that Act. CSW's principal operating subsidiaries are Central Power and Light Company (CPL), West Texas Utilities Company (WTU), Public Service Company of Oklahoma and Southwestern Electric Power Company. CPL is a participant with HL&P in the South Texas nuclear project. See Item 1, "Business-Construction Program". CPL and WTU, as members of the Electric Reliability Council of Texas (ERCOT), have historically conducted their respective utility operations in a manner so that, whenever interconnected directly or indirectly with HL&P and other ERCOT members, they would not transmit electric energy across any state lines. In the proceedings before the SEC, CSW submitted various proposals regarding the future operations of its system, including proposals that would require HL&P and other members of ERCOT to become interconnected directly or indirectly, with CSW's non-Texas subsidiaries. HL&P opposed CSW's synchronous interconnection proposals, because, in its judgment, their implementation would have a substantial detrimental effect on HL&P's cost of operation and reliability of service. In addition, participation by HL&P in a synchronous interstate interconnection could subject it to regulation under the Federal Power Act. As a result of such opposition, CSW has attempted to compel HL&P and other ERCOT members to become interconnected with its non-Texas subsidiaries by initiating proceedings in the federal courts, the Federal Energy Regulatory Commission and the NRC. Proceedings have also been conducted by the Texas Utility Commission which ruled in May 1977 that, pending the outcome of the federal regulatory and judicial proceedings on this matter, the Texas interconnected system (in which HL&P, CPL, WTU and others are participants) must continue to operate on an intrastate basis.

In June 1980, HL&P reached an agreement with CSW which calls for the settlement of all outstanding controversies concerning the question of whether ERCOT should be interconnected with CSW's non-Texas subsidiaries. The agreement provides for the construction of two direct current non-synchronous interconnections between utilities in Texas and in neighboring states through construction of a 200-megawatt interconnection in north Texas and a 500-megawatt interconnection in south Texas. HL&P would construct and own 200 megawatts of the south Texas interconnection and the CSW subsidiaries would construct and own all of the north Texas interconnection and 300 megawatts of the south Texas interconnection. Although HL&P would be required to wheel, transmit, sell, coordinate, comingle and exchange electric power to, from or within the State of Texas over such interconnections, the system is not expected to materially affect the cost of HL&P's construction program or its service reliability because of the non-synchronous, direct current mode of operation. Implementation of the settlement agreement is subject to numerous conditions, including the condition that it be approved by the Federal Energy Regulatory Commission (FERC) pursuant to those provisions of the Federal Power Act (as amended in 1978 by the Public Utility Regulatory Policies Act) which would not require HL&P to become regulated as a "public utility". Implementation is also subject to the approval of other federal and state agencies. No prediction can be made as to whether such approvals can be obtained. In December 1980, the FERC granted a motion of the U.S. Department of Justice to intervene in the settlement proceedings. Such motion generally opposes the proposed settlement. Whether or not the requisite approvals of the settlement proposal are obtained, HL&P intends to continue to oppose any attempts to force it to participate on a synchronous basis in an interconnected system that includes CSW's non-Texas subsidiaries.

Item 4. ***Security Ownership of Certain Beneficial Owners and Management.***

All of HL&P's Common Stock is owned by Houston Industries Incorporated. As of March 16, 1981, no person or group (as that term is used in Section 13(d)(3) of the Securities Exchange Act of 1934) owned more than five percent of HL&P's or its parent's equity securities. Officers and Directors of HL&P as a group beneficially owned less than ½ of 1% of Preferred Stock of HL&P as of such date.

The following table sets forth as of March 16, 1981, the number of shares of Common Stock of Houston Industries beneficially owned by (i) each director and (ii) all directors and officers as a group and the percent of the class of Common Stock so owned.

	Shares of Common Stock Beneficially Owned	Percent of Class(1)
Searcy Bracewell	1,000	*
Wm. R. Brown	1,743	*
H. R. Dean	4,328	.01%
John C. Echols	1,000	*
Howard W. Horne	459	*
D. D. Jordan	6,647	.01%
Thomas B. McDade	2,000	*
G. W. Oprea, Jr.	5,126	.01%
Stewart Orton	100	*
Willard E. Walbridge	250	*
Joe C. Wessendorff	9,454	.02%
Directors and officers as a group	54,174	.12%

(1) Percentages are rounded to the nearest one-hundredth of one percent. Asterisk indicates that the percentage is less than $.01%.

PART II

Item 5. ***Market for the Registrant's Common Stock and Related Security Holder Matters.***

All of HL&P's Common Stock is privately held, beneficially and of record, by its parent, Houston Industries Incorporated.

Item 6. ***Selected Financial Data.***

The following table sets forth selected financial data with respect to HL&P's financial condition and results of operations and should be read in conjunction with the Financial Statements and the related notes included elsewhere herein.

	(thousands of dollars, except per share amounts) Year Ended December 31,				
	1976	1977	1978	1979	1980
Revenues	$ 841,616	$1,069,786	$1,303,604	$1,707,572	$2,123,957
Income after Preferred Dividends	$ 102,794	$ 120,413	$ 122,049	$ 145,950	$ 177,314
AFUDC as a % of Income after Preferred Dividends	16%	20%	24%	29%	24%
Return on average common equity	14.7%	14.4%	12.7%	13.1%	13.4%
At year-end:					
Total Assets	$2,264,064	$2,668,263	$3,140,829	$3,596,982	$4,151,309
Long-term debt	$ 988,000	$1,113,000	$1,354,926	$1,482,200	$1,567,200
Capitalization:					
Common stock equity	40%	40%	39%	41%	45%
Cumulative preferred stock	9	10	8	8	7
Long-term debt	51	50	53	51	48
Total Capitalization	100%	100%	100%	100%	100%
Construction expenditures (excl. AFUDC)	$ 309,775	$ 441,566	$ 462,439	$ 508,372	$ 636,656
Percent of construction expenditures financed internally from operations	49%	40%	39%	39%	37%
Ratio of earnings to fixed charges	3.97	4.08	3.61	3.62	3.54

Item 7. ***Management's Discussion and Analysis of Financial Condition and Results of Operations.***

General

HL&P's operating results have been mixed over the last three years because of the negative pressures of increasing construction expenditures during the periods of high inflation and erratic electric sales due to uncertain economic conditions, weather and energy conservation. Rate increases, which have been approved and implemented approximately once each year, have allowed HL&P to keep pace with its service area's immediate needs for power, but its overall financial condition has deteriorated since the mid 1970's.

The portion of HL&P's construction program that was financed from internally generated funds from operations and interest coverage declined during 1980 reflecting the 25% increase in construction spending and the substantial increase in interest rates. HL&P's return on average common equity has improved somewhat during the past two years principally as a result of $89 million of rate relief realized in 1979 and $106 million in 1980. Nevertheless, as discussed under "Supplementary Information to Disclose the Effects of Changing Prices", electric rates have not kept pace with inflation. As a result, HL&P has been unable to earn the returns on common equity granted by the Utility Commission in its rate orders. HL&P's authorized returns on common equity for 1979 and 1980 were 13.8% and 15% but the actual earned returns were 13.1% and 13.4%, respectively.

Another indication of HL&P's general financial condition is the portion of net income attributable to the allowance for funds used during construction (AFUDC). Although AFUDC, a non-cash item, rose steadily in 1978 and 1979 because of increases in construction activity and increased AFUDC accrual rates due to higher costs of capital, the amount of AFUDC in relation to net income declined in 1980 due to the allowance of larger portions of construction work in progress in rate base by regulatory authorities and the placing in service of the W. A. Parish No. 7 coal-fired unit.

Results of Operation

Earnings for HL&P increased in each of the last three years as a result of sales growth and rate increases, but were adversely affected by rapid escalation in operation and maintenance costs and rising interest rates. Although fuel expense has nearly doubled since 1978, earnings were generally unaffected due to adjustment clauses in the electric service rate schedules.

Revenues. As shown below, the majority of the increase in electric operating revenues has been due to the recovery of increased fuel costs through fuel adjustment clauses.

	% of Revenue Increase Attributable to		
Comparative Periods	Recovery of Increased Fuel Costs	Rate Increases	Increased KWH Sales
1978 v. 1977	73%	5%	22%
1979 v. 1978	63%	22%	15%
1980 v. 1979	63%	25%	12%

Increasing construction expenditures to meet load growth and comply with federal requirements for the conversion to alternate fuel sources, coupled with inflationary pressures, has required HL&P to seek rate increases more frequently. As a result, new rates have been placed in effect in each of the past three years. KWH sales increases have averaged 6% over the last three years, contributing to the growth in revenue. This growth rate is lower than experienced historically due to some conservation by customers and, in 1980, economic conditions affecting the large industrial customers. Because of the widespread use of air conditioning, weather also significantly affects KWH sales in the HL&P service area, primarily in the residential class. An unseasonably mild summer negatively influenced 1979 electric usage. However, an extended heat wave in 1980 caused residential KWH usage to attain record levels and average usage per residential customer increased from 13,522 KWH in 1979 to 14,219 KWH in 1980.

Fuel Expense. These costs have nearly doubled since 1978. The increase in the price of fuel and, to a lesser extent, increased KWH generation are the contributing factors. The rapid increase in fuel costs has contributed to the increase in HL&P's average residential revenue per KWH from 3.4¢ in 1978 to 5.0¢ in 1980. The increases in cost of coal sold for each year are due to larger coal requirements by HL&P for its W. A. Parish Station. HL&P brought new coal-fired units into service in each of the years 1978-1980.

Purchased Power Expense. The increase in these costs reflects economy purchases of energy from other utilities in Texas.

Operating and Maintenance Expenses. Operation and maintenance costs have increased 58% over the last three years because of general inflationary pressures, the use of larger, more complicated generating and pollution control equipment and substantial increases in labor costs. Increased reliance on coal-fired power plants has added significantly to the costs of operation and maintenance. The employee work force has increased by about 21% over the last three years as a result of increasingly complex construction and business activities, additional government regulations and the growth in the number of customers being served.

Non-Operating Items. AFUDC is an amount representing the cost of funds used to finance construction projects and is capitalized as part of the cost of the asset. AFUDC is a non-cash item of net income and represents a cost recoverable from customers through provisions for depreciation in future periods. Increases in amounts for AFUDC not only correspond to increases in construction expenditures, but also to increases in the AFUDC accrual rate and the level of investment in construction that is not earning a cash return. Since January 1979, AFUDC has been computed on a net of tax rate closely following the rising cost of capital. The AFUDC accrual rates for 1978 through 1980 were 6.5%, 7.5% and 8.5%, respectively. Effective January 1, 1981 HL&P began accruing AFUDC at a rate of 9.25%.

In the Utility Commission's final order relating to HL&P's 1979 rate case, the recovery of its investment in a uranium exploration project was disallowed. As a result, $8,964,000 was charged against other income in December 1979.

Liquidity and Capital Resources

Construction and nuclear fuel expenditures (excluding AFUDC) for 1980 and as estimated for the years 1981, 1982 and 1983 are $637 million, $709 million, $783 million and $964 million, respectively. Maturities of long-term debt for this same period include a single maturity of $20 million in 1981.

HL&P expects to finance a portion of its construction program through funds generated internally from operations. Factors affecting the ability of HL&P to fund a portion of its capital requirements from internal funds include regulatory practices allowing a substantial portion of construction work in progress in rate base, adequate depreciation rates, full recovery of the cost of fuel used in the generation of electricity and the opportunity to earn competitive rates of return. It is presently estimated that during the next three years 30% to 35% of HL&P's construction program can be financed through the use of internally generated funds from operations assuming HL&P can obtain rate relief on a timely basis at a level comparable to that most recently granted by the Utility Commission.

The remainder of HL&P's construction program will be financed through proceeds received from the sale of common stock by Houston Industries and the sales of preferred stocks and long-term debt by HL&P. HL&P's capitalization ratios at December 31, 1980 consisted of 48% long-term debt, 7% preferred stock and 45% common stock and retained earnings with similar ratios expected to be maintained in the future. Principally because of HL&P's large capital requirements, Moody's Investors Service, Inc. lowered its rating of HL&P's First Mortgage Bonds and Preferred Stock in 1980 from double A to single A; however, two other rating agencies continue to rate HL&P's securities double A. As a result of such downgrading, HL&P expects relatively higher capital costs in connection with its future sales of long-term debt and preferred stock.

For information regarding bank lines of credit and short-term borrowings see Note 4 to the Financial Statements.

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Item 8. *Financial Statements and Supplementary Data.*

HOUSTON LIGHTING & POWER COMPANY

STATEMENTS OF INCOME

(Thousands of Dollars)

	Year Ended December 31, 1978	1979	1980
Operating Revenues	$1,303,604	$1,707,572	$2,123,957
Operating Expenses:			
Fuel	682,261	958,112	1,206,872
Operation	134,756	167,665	203,467
Purchased power	4,753	8,440	29,995
Maintenance	55,354	77,703	97,598
Depreciation and amortization	73,280	93,746	103,771
Federal income taxes:			
Current	10,229	10,911	26,233
Deferred:			
Liberalized depreciation	33,064	29,576	37,038
Investment tax credit – current	49,544	61,289	49,891
Amortization of investment tax credit	(2,889)	(4,563)	(5,477)
Other – net	4,767	14,939	22,773
Other taxes	62,251	72,853	80,856
Total	1,107,370	1,490,671	1,853,017
Operating Income	196,234	216,901	270,940
Other Income:			
Allowance for other funds used during construction	17,029	31,928	32,735
Other – net	3,992	383	3,722
Total	21,021	32,311	36,457
Income Before Interest Charges	217,255	249,212	307,397
Interest Charges:			
Interest on long-term debt	84,307	101,566	122,695
Other interest	5,208	2,136	5,159
Allowance for borrowed funds used during construction	(11,639)	(10,911)	(9,619)
Taxes applicable to allowance for borrowed funds used during construction		(9,294)	(8,194)
Total	77,876	83,497	110,041
Net Income	139,379	165,715	197,356
Dividends on Preferred Stock	17,330	19,765	20,042
Income After Preferred Dividends	$ 122,049	$ 145,950	$ 177,314
Ratio of Earnings to Fixed Charges	3.61	3.62	3.54
Ratio of Earnings to Fixed Charges and Preferred Dividend Requirements	2.72	2.76	2.81

See Notes to Financial Statements.

HOUSTON LIGHTING & POWER COMPANY

BALANCE SHEETS

(Thousands of Dollars)

ASSETS

	December 31, 1979	December 31, 1980
Property, Plant and Equipment:		
Electric plant, at original cost —		
Production	$1,578,928	$1,881,347
Transmission	299,483	333,698
Distribution	779,741	879,551
General	183,144	214,849
Construction work in progress	972,526	1,143,102
Nuclear fuel in process	83,947	104,947
Electric plant acquisition adjustments, at cost	3,166	3,166
Total	3,900,935	4,560,660
Less accumulated depreciation and amortization	591,465	678,717
Property, plant and equipment — net	3,309,470	3,881,943
Current Assets:		
Cash in banks	11,614	11,840
Temporary cash investments, at cost	52,129	
Working funds and special deposits	5,266	5,377
Accounts receivable:		
Customers	63,853	84,247
Affiliated companies	127	336
Others	18,227	18,302
Inventory, at average cost:		
Fuel oil	47,843	66,364
Materials and supplies	31,296	31,180
Other	14,046	2,934
Total	244,401	220,580
Deferred Debits	43,111	48,786
Total	$3,596,982	$4,151,309

See Notes to Financial Statements.

HOUSTON LIGHTING & POWER COMPANY

BALANCE SHEETS

(Thousands of Dollars)

LIABILITIES

	December 31, 1979	December 31, 1980
Capitalization (statement on following page):		
Common stock equity	$1,208,310	$1,[illegible],230
Cumulative preferred stock	243,518	243,518
Long-term debt	1,482,200	1,567,200
Total	2,934,028	3,262,948
Current Liabilities:		
Notes payable	1,084	50,870
Accounts payable	114,763	133,305
Accounts payable to affiliated companies	11,883	9,546
Taxes accrued	27,278	44,245
Interest accrued	28,086	29,324
Accrued liabilities to municipalities	36,008	45,557
Dividends declared	5,010	5,010
Current portion of long-term debt		20,000
Other	16,217	22,695
Total	240,329	360,552
Deferred Credits:		
Accumulated deferred federal income taxes	206,569	267,249
Unamortized investment tax credit	192,606	235,791
Other	15,081	16,384
Total	414,256	519,424
Property Insurance Reserve	8,369	8,385
Commitments and Contingencies		
Total	$3,596,982	$4,151,309

See Notes to Financial Statements.

HOUSTON LIGHTING & POWER COMPANY

STATEMENTS OF CAPITALIZATION

(Thousands of Dollars)

	December 31, 1979	December 31, 1980
COMMON STOCK EQUITY:		
Common stock, no par; authorized, 50,000,000 shares; outstanding 36,217,276 shares at December 31, 1979 and 42,964,777 shares at December 31, 1980	$ 588,276	$ 760,741
Retained earnings	620,034	691,489
Total common stock equity	1,208,310	1,452,230
CUMULATIVE PREFERRED STOCK – no par; authorized, 10,000,000 shares; outstanding (entitled upon involuntary liquidation to $100 a share):		
$4 series, 97,397 shares	9,740	9,740
$6.72 series, 250,000 shares	25,115	25,115
$7.52 series, 500,000 shares	50,225	50,225
$9.52 series, 400,000 shares	39,372	39,372
$9.08 series, 400,000 shares	39,395	39,395
$8.12 series, 500,000 shares	50,098	50,098
$9.04 series, 300,000 shares	29,573	29,573
Total Cumulative Preferred Stock	243,518	243,518
LONG-TERM DEBT:		
First mortgage bonds:		
3¼% Series, due 1981	20,000	20,000
2¾% Series, due 1985	30,000	30,000
3¼% Series, due 1986	30,000	30,000
4¾% Series, due 1987	40,000	40,000
3 % Series, due 1989	30,000	30,000
4⅞% Series, due 1989	25,000	25,000
4½% Series, due 1992	25,000	25,000
5¼% Series, due 1996	40,000	40,000
5¼% Series, due 1997	40,000	40,000
6¾% Series, due 1997	35,000	35,000
6¾% Series, due 1998	35,000	35,000
7½% Series, due 1999	30,000	30,000
7¼% Series, due 2001	50,000	50,000
7½% Series, due 2001	50,000	50,000
8⅛% Series, due 2004	100,000	100,000
10⅛% Series, due 2004	100,000	100,000
8¾% Series, due 2005	125,000	125,000
8⅜% Series, due 2006	125,000	125,000
8⅜% Series, due 2007	125,000	125,000
8⅞% Series, due 2008	125,000	125,000
9¼% Series, due 2008	100,000	100,000
11¼% Series, due 2009	125,000	125,000
12 % Series, due 2010		100,000
Total first mortgage bonds	1,405,000	1,505,000
5½ debenture, due 1985	40,000	40,000
Pollution control revenue bonds:		
7⅜% Series, due 2004	18,000	18,000
9.5% Series, due 1998	19,200	19,200
9.9% Series, due 1998		5,000
Subtotal	1,482,200	1,587,200
Less: Current maturity of first mortgage bond, due 1981		20,000
Total long-term debt	1,482,200	1,567,200
Total Capitalization	$2,934,028	$3,262,948

See Notes to Financial Statements.

HOUSTON LIGHTING & POWER COMPANY
STATEMENTS OF RETAINED EARNINGS
(Thousands of Dollars)

	Year Ended December 31		
	1978	1979	1980
BALANCE AT BEGINNING OF PERIOD	$497,079	$553,213	$620,034
ADD – NET INCOME	139,379	165,715	197,356
Total	636,458	718,928	817,390
DEDUCT – CASH DIVIDENDS:			
Preferred:			
$4 Series	390	390	390
$6.72 Series	1,680	1,680	1,680
$7.52 Series	3,760	3,760	3,760
$9.52 Series	3,808	3,808	3,808
$9.08 Series	3,632	3,632	3,632
$8.12 Series	4,060	4,060	4,060
$9.04 Series (annual rate of $9.04 a share from February 6, 1979)		2,435	2,712
Common:			
1978, $2.12; 1979, $2.36; 1980, $2.68 (a share)	65,915	79,129	105,859
Total	83,245	98,894	125,901
BALANCE AT END OF PERIOD	$553,213	$620,034	$691,489

See Notes to Financial Statements.

HOUSTON LIGHTING & POWER COMPANY
STATEMENTS OF CHANGES IN FINANCIAL POSITION
(Thousands of Dollars)

	Year Ended December 31,		
	1978	1979	1980
Sources of funds:			
Operations:			
Net income	$139,379	$165,715	$197,356
Items not requiring an outlay of working capital:			
Depreciation and amortization	74,361	94,764	108,298
Deferred federal income taxes — net	37,831	30,922	51,617
Investment tax credit deferred — net	40,782	48,832	44,414
Allowance for funds used during construction	(28,668)	(42,839)	(42,354)
Total	263,685	297,394	359,331
Dividends declared	(83,245)	(98,894)	(125,901)
Reinvested funds from operations	180,440	198,500	233,430
Financing:			
Sale of common stock	65,224	131,518	172,465
Sale of preferred stock		29,573	
Sale of first mortgage bonds	225,000	125,000	100,000
Pollution control revenue bonds	16,926	2,274	5,000
Sale of coal handling facilities to affiliate	35,424		
Change in notes payable and temporary cash investments	(91,296)	15,422	101,915
Reclassification to current maturity of long-term debt			(20,000)
	251,278	303,787	359,380
Other:			
Decrease (increase) in working capital (exclusive of notes payable and temporary cash investments)	36,277	(3,555)	42,129
Other — net	(5,556)	9,640	1,717
	30,721	6,085	43,846
Total	$462,439	$508,372	$636,656
Application of funds:			
Construction and nuclear fuel expenditures and lignite advance (net of allowance for funds used during construction)	$462,439	$508,372	$636,656
Increase (decrease) in working capital (exclusive of notes payable and temporary cash investments):			
Current assets:			
Cash in banks	$ (1,512)	$ 1,563	$ 226
Customer accounts receivable	16,675	5,614	20,394
Accounts receivable from affiliated companies	(83)	(163)	209
Inventory	1,506	8,194	18,405
Other	6,765	3,420	(10,926)
Total	23,351	18,628	28,308
Current liabilities:			
Accounts payable	29,467	6,424	18,542
Accounts payable to affiliated companies	6,112	4,833	(2,337)
Taxes and interest accrued	13,676	(5,051)	18,205
Other	10,373	8,867	36,027
Total	59,628	15,073	70,437
Increase (decrease) in working capital (exclusive of notes payable and temporary cash investments)	$(36,277)	$ 3,555	$(42,129)

See Notes to Financial Statements.

HOUSTON LIGHTING & POWER COMPANY

NOTES TO FINANCIAL STATEMENTS

For the Three Years Ended December 31, 1980

(1) Summary of Significant Accounting Policies

System of Accounts

The accounting records of HL&P are maintained in accordance with the Federal Energy Regulatory Commission's Uniform System of Accounts which have been adopted by the Public Utility Commission of Texas (Utility Commission).

Electric Plant

Additions to electric plant, reduced by contributions in aid of construction, betterments to existing property, and replacements of units of property are capitalized at cost. Cost includes the original cost of contracted services, direct labor and material, indirect charges for engineering supervision and similar overhead items, and an allowance for funds used during construction (AFUDC).

Maintenance of property and replacements and renewals of items determined to be less than units of property are charged to expense. The actual or average book cost of units of property replaced or renewed are removed from plant and such costs plus removal cost, less salvage, are charged to accumulated depreciation.

HL&P computes depreciation using the straight-line method. The depreciation provision as a percentage of the depreciable cost of plant was 3.2% for 1978, 3.5% for 1979 and 3.6% for 1980.

Allowance for Funds Used During Construction

Prior to 1979, HL&P accrued AFUDC at a rate of 6½% on projects estimated to cost in excess of $50,000 and estimated to require more than 90 days to construct. During 1979, HL&P accrued AFUDC at a 7½% rate, net of federal income taxes, on construction projects and nuclear fuel payments except for amounts included in the rate base by regulatory authorities. Effective January 1, 1980, the accrual rate was increased to 8½%, net of federal income taxes.

Operating Revenues

Revenues are recognized from the sale of electricity as bills are rendered to customers. Rate schedules include fuel adjustment clauses which permit recovery of fuel expenses in the month incurred.

Federal Income Taxes

Houston Industries and its subsidiaries file a consolidated income tax return. HL&P records as its current income tax expense an amount equal to the tax it would have to pay if it filed a separate income tax return.

Since January 1979, HL&P has followed a policy of comprehensive interperiod income tax allocation. Prior to January 1979, deferred income taxes were not recognized on the borrowed funds component of AFUDC which is deducted currently for federal income tax purposes.

Investment tax credits are deferred and amortized over the estimated lives of the related property.

Property Insurance Reserves

The cost of replacing uninsured plant losses, less related tax effects, are charged against the reserve when incurred. Effective January 1980, additional accruals to the reserve have been denied by regulatory authorities.

(2) Preferred Stock

Any part or all of the preferred stock may be redeemed at the option of HL&P at the following per share prices, plus any unpaid accrued dividends to date of redemption:

$4 Series – $105.00. $6.72 Series: through July 31, 1983 – $103.51; thereafter – $102.51. $7.52 Series: through October 31, 1982 – $105.35; thereafter – $103.35 to $102.35. $9.52 Series: through September 30, 1985 – $109.52; thereafter – $105.00 to $101.00. $9.08 Series: through March 31, 1981 – $109.08; thereafter – $105.00 to $101.00. $8.12 Series: through November 30, 1982 – $109.37; thereafter – $106.25 to $102.25. $9.04 Series: through January 31, 1984 – $109.04; thereafter – $105.00 to $101.00.

(3) Long-Term Debt

At December 31, 1980, sinking or improvement fund requirements of HL&P's first mortgage bonds outstanding will be $27,850,000 for the year 1981, $28,700,000 in 1982 and $29,700,000 for each of the years 1983 through 1985. Of such requirements, $15,050,000 for the year 1981 and $14,850,000 for each of the years 1982 through 1985 may be satisfied by certification of property additions at 100% of the requirements and the remainder through certification of such property additions at 166⅔% of the requirements. Sinking or improvement fund requirements for 1980 and prior years have been satisfied by certification of property additions.

Annual maturities of long-term debt are $20,000,000 in 1981 and $70,000,000 in 1985.

The issuable amount of first mortgage bonds is unlimited as to authorization, but limited by property, earnings, and other provisions of the mortgage and deed of trust and the supplemental indentures thereto. Substantially all properties are subject to liens securing its long-term debt.

(4) Short-Term Financing

The interim financing requirements are met through short-term bank loans and the issuance of commercial paper. HL&P has bank lines of credit aggregating $250 million (as compared with $200 million during 1979) which limit its total short-term borrowings and provide for interest at the prime rate. Bank loans and commercial paper outstanding were $20,000,000 and $30,000,000 at December 31, 1980, respectively. There was no short-term indebtedness at December 31, 1979. Compensating balances are not required under the lines of credit.

(5) Retirement Plan

HL&P has a noncontributory retirement plan covering substantially all employees. The policy of HL&P is to fund pension costs accrued, which includes amortization of prior service costs, over a period of thirty to forty years.

The total cost of the retirement plan for each of the years 1978 through 1980 was $4,773,000, $6,223,000 and $7,563,000, respectively. In 1979, the assumed return on plan investments was increased to 7% and the plan was amended to provide substantially increased benefits for all plan participants. The net effect of the change and amendment was to increase prior service costs by $14,210,000 and pension cost accrued by $1,400,000 for 1979. As of January 1, 1980, actuarially computed prior service costs were $34,047,000. A comparison of accumulated plan benefits and plan net assets for the retirement plan is presented below:

	January 1,	
	1979	1980
Actuarial present value of accumulated plan benefits:		
Vested	$49,139,000	$49,280,000
Nonvested	2,341,000	4,179,000
	$51,480,000	$53,459,000
Market value of net assets available for plan benefits	$50,680,000	$67,272,000

NOTES TO FINANCIAL STATEMENTS (Continued)

(6) Commitments and Contingencies

Significant commitments have been incurred in connection with HL&P's construction program and for nuclear fuel purchases. The construction program is presently estimated to cost $691 million in 1981, $759 million in 1982 and $947 million in 1983. These amounts do not include estimated expenditures of $60 million for uranium concentrate and nuclear fuel processing services for the South Texas and Allens Creek nuclear plants. Commitments in connection with the construction program, principally for generating plants and related facilities, are generally revocable by HL&P subject to reimbursement of manufacturers for expenditures incurred or other cancellation penalties. These amounts do not include estimates of the allowance for funds used during construction. HL&P has no material lease commitments.

(7) Jointly Owned Electric Plant

HL&P is project manager and one of four participants in the South Texas Nuclear project which consists of two 1250 megawatt nuclear generating units. Each participant finances its own share of construction expenditures with HL&P's participating interest in the project being 30.8%. As of December 31, 1980, HL&P's share of expenditures included in construction work in progress and nuclear fuel in process were $450 million and $39 million, respectively.

(8) Regulatory Proceedings

As part of the Utility Commission's final rate order in January 1980, the Utility Commission disallowed HL&P's request to amortize its investment in a uranium exploration project terminated in October 1978. As a result $4,661,000 (net of federal income taxes) was charged against income in the month of December 1979. A number of accounting changes were implemented in January 1980 as a result of the Utility Commission's January 1980 order. Such changes include (1) the capitalization of ad valorem taxes related to construction work in progress (2) the capitalization of employee benefits and depreciation of transportation equipment related to construction and (3) the discontinuance of accruals to the reserves for property insurance and injuries and damages.

(9) Federal Income Taxes

Effective federal income tax rates are lower than statutory corporate rates for each year as follows:

	Year Ended December 31,		
	1978	1979	1980
	Thousands of Dollars		
Federal income taxes at statutory corporate rate	$112,365	$125,839	$150,884
Reduction in taxes resulting from:			
Allowance for other funds used during construction	13,761	14,687	15,058
Other – net	3,889	3,303	5,173
Total	17,650	17,990	20,231
Federal income taxes	$ 94,715	$107,849	$130,653
Effective rate	40.5%	39.4%	39.8%

At December 31, 1980, HL&P had an investment tax credit carryover of approximately $7,484,000.

(10) Supplementary Expense Information

	Year Ended December 31, 1978	1979	1980
	(Thousands of Dollars)		
Taxes, other than income taxes, were charged to expenses as follows:			
Ad valorem	$ 38,131	$ 42,666	$ 42,686
State gross receipts	12,686	16,044	20,717
Payroll	4,897	6,189	7,467
PUC assessment	2,079	2,885	3,671
Miscellaneous	4,458	5,069	6,315
Total taxes other than income taxes	$ 62,251	$ 72,853	$ 80,856
Research and development costs charged to expenses	$ 8,775	$ 10,152	$ 12,146

(11) Principal Transactions Between HL&P, its Parent and Other Related Companies

Pursuant to the corporate restructuring in 1977, Houston Industries assumed joint and several liability with HL&P for payment of principal and interest on the $40,000,000 of 5½% Convertible Debentures due 1985 issued by HL&P. In consideration thereof, HL&P issued Houston Industries a $40,000,000, 5½% debenture. Included in "Interest on long-term debt" in the accompanying Statements of Income for each of the years ended December 31, 1978, 1979 and 1980 is $2,200,000 related to this debenture.

HL&P issued 2,310,354, 4,902,280 and 6,747,501 shares in 1978, 1979 and 1980, respectively, of common stock to Houston Industries for a total consideration of $65,224,000, $131,518,000 and $172,465,000 in 1978, 1979 and 1980, respectively. Common stock dividends paid to Houston Industries by HL&P amounted to $65,915,000, $79,129,000 and $105,859,000 in 1978, 1979 and 1980, respectively.

In May 1978, HL&P sold at cost its coal handling facilities to Utility Fuels, Inc., another wholly-owned subsidiary of Houston Industries. "Operating Expenses – Fuel" in the accompanying Statements of Income for the years ended December 31, 1978, 1979 and 1980 includes $20,823,000, $105,686,000 and $202,953,000, respectively, of coal purchased from Utility Fuels.

(12) Unaudited Quarterly Information

The following unaudited quarterly financial information for 1979 and 1980 includes, in the Company's opinion, all adjustments (which comprise only normal recurring accruals) necessary for a fair presentation.

	Revenues	Net Operating Income	Income After Preferred Dividends
	(Thousands of Dollars)		
March 31, 1979	$357,148	$ 44,122	$27,308
June 30, 1979	413,386	49,769	32,223
September 30, 1979	513,157	74,184	57,296
December 31, 1979	423,881	48,826	29,123(a)
March 31, 1980	416,378	46,138	26,031
June 30, 1980	521,515	59,583	37,100
September 30, 1980	676,673	99,072	75,226
December 31, 1980	509,391	66,147	38,957

(a) See Note 8, "Regulatory Proceedings" regarding the December 1979 charge against HL&P's income.

(13) Reclassification

Certain amounts from previous years have been reclassified to conform to the 1980 presentation of the financial statements. Such reclassifications are immaterial and do not affect earnings.

(14) Other

On February 10, 1981, HL&P issued $125,000,000 of 13⅞% First Mortgage Bonds due February 1, 1991.

In March 1981 (subsequent to the date of the Auditors' Opinion), HL&P issued approximately 3,000,000 shares of common stock to Houston Industries. The proceeds were used by HL&P to defray the cost of its construction program including the repayment of short-term debt incurred in connection with such program. To the extent that such proceeds were not immediately so used, they were temporarily invested in short-term interest bearing obligations.

AUDITORS' OPINION

Houston Lighting & Power Company:

We have examined the balance sheets and the statements of capitalization of Houston Lighting & Power Company as of December 31, 1979 and 1980 and the related statements of income, retained earnings and changes in financial position for each of the three years in the period ended December 31, 1980. Our examinations were made in accordance with generally accepted auditing standards and, accordingly, included such tests of the accounting records and such other auditing procedures as we considered necessary in the circumstances.

In our opinion, the above-mentioned financial statements present fairly the financial position of the Company at December 31, 1979 and 1980 and the results of its operations and the changes in its financial position for each of the three years in the period ended December 31, 1980, in conformity with generally accepted accounting principles applied on a consistent basis.

Our examinations also comprehended the supplemental schedules V, VI, VIII and IX for each of the three years in the period ended December 31, 1980. In our opinion, such supplemental schedules, when considered in relation to the basic financial statements, present fairly in all material respects the information shown therein.

DELOITTE HASKINS & SELLS

Houston, Texas
February 16, 1981

SUPPLEMENTARY INFORMATION TO DISCLOSE THE EFFECTS OF CHANGING PRICES (UNAUDITED)

Financial statements of business enterprises, in accordance with generally accepted accounting principles, reflect historical costs and dollars of varying purchasing power and accordingly do not measure the effects of inflation. The following unaudited supplementary information is supplied in accordance with the requirements of Financial Accounting Standards Board (FASB) Statement No. 33, Financial Reporting and Changing Prices, for the purpose of providing certain information regarding the effects of both general inflation (constant dollars) and changes in specific prices (current cost), which are not reflected in traditional financial statements. Constant dollar amounts represent historical costs stated in terms of dollars of equal purchasing power, as measured by the Consumer Price Index for all Urban Consumers (CPI-U). Current cost amounts reflect the changes in specific prices of property from the date the property was acquired to the present, and may differ from constant dollar amounts to the extent that specific prices have increased more or less rapidly than prices in general. This information should be viewed only as an estimate of the approximate effect of inflation rather than as a precise measurement.

HL&P, in common with other electric utility companies in general, continues to be adversely impacted by the effects of an inflationary economy. Certain effects of inflation such as higher interest costs associated with long-term bonds and increased operating and maintenance costs are reflected in traditional financial statements. Increased revenues to recover such expenses, however, tend to lag behind the actual incurrence of such increased costs. Electric rates are established based on costs as of a specific point in time and are designed to allow the electric utility to recover its operating costs and earn a fair rate of return on its investment in property, plant and equipment. However, in a highly inflationary environment, expenses have increased at a much greater rate than the increase in electric sales which has resulted in an erosion of return on invested capital. It is unlikely that rates based on historical costs can keep pace with increased costs during inflationary periods. This has resulted, in part, in the need for larger and more frequent rate increases.

There are a number of other effects of inflation which are not reflected in traditional financial statements and to which the accompanying supplementary information is intended to give effect. One major expense so affected is depreciation. The cost of constructing and replacing property, plant and equipment has been escalating dramatically. Historical financial statements reflect depreciation based on the historical costs of assets and do not reflect the true economic cost of the asset "used up" and which must be replaced at substantially higher future values. However, a substantial amount of such assets are financed with long-term bonds and preferred stock which effectively acts as a hedge against the impact of inflation. Utility plant financed from investment by common shareholders and retained earnings are not afforded such a hedge. While a certain amount of the impact on such depreciation is reduced through higher returns allowed on the common equity investment in property when electric rates are established, the end result of continuing inflation is an erosion of the common equity investment when viewed in terms of real purchasing power.

STATEMENT OF INCOME ADJUSTED FOR CHANGING PRICES

For the Year Ended December 31, 1980

(In thousands of dollars)

	Conventional Historical Cost	Constant Dollar Average 1980 Dollars	Current Cost Average 1980 Dollars
Operating Revenues	$2,123,957	$2,123,957	$2,123,957
Operating Expenses:			
Fuel	1,206,872	1,206,872	1,206,872
Depreciation	103,771	196,174	207,555
Operation and maintenance	301,065	301,065	301,065
Purchased power	29,995	29,995	29,995
Income and other taxes	211,314	211,314	211,314
Interest expense	110,041	110,041	110,041
Other income and deductions – net	(36,457)	(36,457)	(36,457)
Net Income (excluding reduction to net recoverable cost)	$ 197,356	$ 104,953*	$ 93,572
Increase in specific prices (current cost) of property, plant, and equipment held during the year**			$ 601,245
Less increase in cost of property, plant, and equipment adjusted for changes in general price level			715,069
Excess of increase in general price level over increase in specific prices			(113,824)
Reduction of utility property to net recoverable costs		(329,671)	(204,466)
Gain from decline in purchasing power of net amounts owed		271,330	271,330
Net		$ (58,341)	$ (46,960)

* Including the reduction to net recoverable cost, loss on a constant dollar basis would have been $224,718 for 1980.

** At December 31, 1980, current cost of property, plant and equipment, net of accumulated depreciation was $6,706,421, while historical cost was $3,381,943.

FIVE YEAR COMPARISON OF SELECTED SUPPLEMENTARY FINANCIAL DATA ADJUSTED FOR EFFECTS OF CHANGING PRICES

(In thousands of average 1980 dollars, except per share amounts)

	1976	1977	1978	1979	1980
Revenues					
Historical	$ 841,616	$1,069,786	$1,303,604	$1,707,572	$2,123,957
Constant dollar	1,218,245	1,454,673	1,646,517	1,938,495	2,123,957
Net Income					
Historical				$ 165,715	$ 197,356
Constant dollar				110,620	104,953
Current cost				94,767	93,572
Common Stock Equity at year-end (including electric utility property only to the extent recoverable)					
Historical				$1,208,310	$1,452,230
Constant dollar				1,297,133	1,387,036
Current cost				1,297,133	1,387,036
Gain from decline in purchasing power of net amounts owed				$ 283,284	$ 271,330
Excess of increase in general price level over increase in specific prices				$ 294,734	$ 113,824
Average consumer price index	170.5	181.5	195.4	217.4	246.8

Property, plant and equipment as referred to in the accompanying data includes utility plant in service, land, land rights and property held for future use, nuclear fuel in process and construction work in progress. The constant dollar information was determined by adjusting historical amounts by the ratio of the average level of the CPI-U during the year the assets were acquired or constructed to the average CPI-U index for 1980. Current cost of properties was determined primarily by indexing surviving plant by the Handy-Whitman Index of Public Utility Construction Costs. Current cost information does not represent the replacement cost of HL&P's productive capacity since plant would not be replaced precisely in kind, but rather is an approximation of the current cost of existing assets. The constant dollar and current cost provisions for depreciation were determined by applying the Company's historical depreciation rates to the restated property amounts.

As allowed by FASB No. 33, items in the income statement, other than depreciation expenses, were not adjusted. The cost of fuel used in electric generation and operating and maintenance expenses are essentially stated in terms of average current year prices and therefore do not require restatement.

In accordance with FASB No. 33, federal income tax expense has not been adjusted. Current federal income tax policy recognizes to a certain extent the effects of inflation. Liberalized depreciation allowances and the investment tax credit accelerate capital recovery. However, as the statutory federal income tax rate has remained stable the effective rate has increased significantly as a result of the declining purchasing power of the related taxable income. HL&P's effective federal income tax rate in 1980, when adjusted for inflation, is 55 percent under constant dollar and 58 percent under current cost, each of which exceeds its reported effective tax rate of 40 percent and the statutory rate of 46 percent.

Under the rate making prescribed by the regulatory authorities to which HL&P is subject, only the historical cost of plant is recoverable through depreciation. Therefore, the excess of the cost of utility plant stated in terms of constant dollars and current cost that occurred as a result of inflation in the current year over the historical cost of utility plant is not presently recoverable in rates as depreciation and is reflected as a reduction to net recoverable cost.

To properly reflect the economics of rate regulation in the Statement of Income Adjusted for Changing Prices, the reduction of net property, plant, and equipment should be offset by the gain from the decline in purchasing power of net amounts owned. During a period of inflation, holders of monetary assets suffer a loss of general purchasing power while holders of monetary liabilities experience a gain. The gain from the decline in purchasing power of net amounts owed is primarily attributable to the substantial amount of debt and preferred stock which has been used to finance property, plant and equipment. However, since the depreciation on this utility plant is limited to the recovery of historical costs, HL&P does not have the opportunity to realize a holding gain, and is limited to recovery only of the embedded cost of such capital. Thus, to the extent that utility plant is financed with debt and preferred stock the reduction to net recoverable cost and the holding gain essentially offset each other.

As indicated above, the rates charged by HL&P are regulated. As a result it is not as free as a non-regulated enterprise to raise its prices in response to inflation. Further, except in the case of fuel costs, the regulatory process introduces a substantial time lag between the incurrence of operating and capital costs and the recovery of such costs. This is commonly referred to in the industry as "regulatory lag" and is one of the most significant factors contributing to the erosion of investor capital. Compounding the problem is the fact that HL&P must compete in the same marketplace as a non-regulated enterprise for capital necessary to finance its construction program.

PART III

Item 9. ***Directors and Executive Officers of the Registrant.*** **(*)**

Item 10. ***Management Remuneration and Transactions.*** **(*)**

* The information called for by Items 9 and 10, to the extent not set forth under Item 1, "Business – Executive Officers", is set forth in the definitive proxy statement relating to the 1981 Annual Meeting of Shareholders of Houston Industries Incorporated (parent of the registrant), pursuant to the Commission's Regulation 14A (File No. 1-7629). Such definitive proxy statement relates to a meeting of shareholders involving the election of directors and is incorporated herein by reference pursuant to Instruction G to Form 10-K. The Board of Directors of the registrant is composed of the same individuals as the Board of Directors of Houston Industries Incorporated. The principal executive officers of Houston Industries Incorporated serve in substantially identical capacities with the registrant. For the fiscal year ended December 31, 1980, the aggregate remuneration paid by HL&P to all of its directors and officers as a group (24 persons) amounted to $1,790,980.

PART IV

Item 11. ***Exhibits, Financial Statement Schedules, and Reports on Form 8-K.***

(a)(1) **Financial Statements.**

(a)(2) **Financial Statement Schedules.**

Schedules for the three years ended December 31, 1980:

The following schedules are omitted because of the absence of the conditions under which they are required or because the required information is included in the financial statements.

I, II, III, IV, VII, X, XI, XII and XIII.

(a)(3) **Exhibits.**

See Exhibit Index on Page 41.

(b) **Reports on Form 8-K.**

HL&P filed reports on Form 8-K during the fourth quarter of 1980 as follows:

November 21, 1980 (date of earliest event reported) Item 5. OTHER MATERIALLY IMPORTANT EVENTS:

(1) On November 21, 1980, HL&P was advised by Moody's Investors Service that its First Mortgage Bonds and Preferred Stock had been downgraded from Double-A (Aa) to Single-A (A) or equivalent.

(2) On December 3, 1980, HL&P elected to cancel its plans to offer on December 10, 1980, $35 million of a new series of Preferred Stock and deferred its planned offering of $125 million principal amount of First Mortgage Bonds.

SCHEDULE V – PROPERTY, PLANT AND EQUIPMENT

For the Three Years Ended December 31, 1980

(Thousands of Dollars)

Col. A	Col. B	Col. C	Col. D	Col. E	Col. F
Classification	Balance Beginning of Year	Additions at Cost	Retirements	Other Changes — Add (Deduct)	Balance End of Year
For the Year Ended December 31, 1980:					
Production Plant	$1,578,928	$304,475	$ 2,056		$1,881,347
Transmission Plant	299,483	34,925	710		333,698
Distribution Plant	779,741	112,105	12,295		879,551
General Plant	183,144	35,564	3,859		214,849
Plant Acquisition Adjustments	3,166				3,166
Total Plant	2,844,462	487,069	18,920		3,312,611
Construction Work in Progress (A)	972,526	170,576			1,143,102
Nuclear Fuel in Process	83,947	21,000			104,947
Total	$3,900,935	$678,645	$18,920		$4,560,660
For the Year Ended December 31, 1979:					
Production Plant	$1,551,962	$ 27,236	$ 270	$	$1,578,928
Transmission Plant	290,951	9,055	523		299,483
Distribution Plant	683,425	107,052	10,736		779,741
General Plant	165,789	20,014	2,659		183,144
Plant Acquisition Adjustments	3,166				3,166
Total Plant	2,695,293	163,357	14,188		2,844,462
Construction Work in Progress (A)	621,175	351,351			972,526
Nuclear Fuel in Process	69,995	17,912		(3,960)	83,947
Total	$3,386,463	$532,620	$14,188	$(3,960)	$3,900,935
For the Year Ended December 31, 1978:					
Production Plant	$1,296,211	$257,147	$ 1,396		$1,551,962
Transmission Plant	273,381	19,321	1,751		290,951
Distribution Plant	616,936	80,133	13,644		683,425
General Plant	160,127	7,311	1,649		165,789
Plant Acquisition Adjustments	3,166				3,166
Total Plant	2,349,821	363,912	18,440		2,695,293
Construction Work in Progress (A)	538,109	83,066			621,175
Nuclear Fuel in Process	61,291	8,704			69,995
Total	$2,949,221	$455,682	$18,440		$3,386,463

NOTES:

(A) Substantially all additions are originally charged to CWIP and transferred to electric utility plant accounts upon completion. Additions at cost give effect to such transfers.

(B) Additions at cost include non-cash charges for an allowance for other funds used during construction.

(C) HL&P computes depreciation using the straight-line method The depreciation provisions as a percentage of the depreciable cost of plant was 3.2% in 1978, 3.5% in 1979 and 3.6% in 1980.

SCHEDULE VI – ACCUMULATED PROVISION FOR DEPRECIATION AND AMORTIZATION OF PROPERTY, PLANT AND EQUIPMENT

For the Three Years Ended December 31, 1980

(Thousands of Dollars)

Col. A	Col. B	Col. C		Col. D		Col. E
		Additions		Deductions from Reserve		
Description	Balance at Beginning of Period	Charged to Income	Charged to Other Accounts	Retirements, Renewals and Replacements	Other	Balance at Close of Period
Year Ended December 31, 1980 –						
Depreciation and amortization of property, plant and equipment	$591,465	$103,771	$4,527	$21,046		$678,717
Year Ended December 31, 1979 –						
Depreciation and amortization of property, plant and equipment	$512,604	$ 93,746	$1,018	$15,903		$591,465
Year Ended December 31, 1978 –						
Depreciation and amortization of property, plant and equipment	$450,946	$ 73,280	$1,081	$12,703		$512,604

SCHEDULE VIII – RESERVES

For the Three Years Ended December 31, 1980

(Thousands of Dollars)

Col. A	Col. B	Col. C		Col. D	Col. E
		Additions			
Description	Balance at Beginning of Period	Charged to Income	Charged to Other Accounts	Deductions from Reserves (A)	Balance at Close of Period
Year Ended December 31, 1980:					
Accumulated provisions, deducted from related assets on balance sheet:					
Uncollectible accounts	$3,691	$7,876		$7,858	$3,709
Inventory adjustments (B)	1,028	78	$ 393	90	1,409
Reserves other than those deducted from assets on balance sheet:					
Property insurance	8,369			(16)	8,385
Injuries and damages	450			450	–0–
Year Ended December 31, 1979:					
Accumulated provisions, deducted from related assets on balance sheet:					
Uncollectible accounts	$ 250	$8,956		$5,515	$3,691
Inventory adjustments (B)	785	77	$ 278	112	1,028
Reserves other than those deducted from assets on balance sheet:					
Property insurance	8,500	100		231	8,369
Injuries and damages	408	142		100	450
Year Ended December 31, 1978:					
Accumulated provisions, deducted from related assets on balance sheet:					
Uncollectible accounts	$ 453	$3,653		$3,856	$ 250
Inventory adjustments (B)	689	49	$ 294	247	785
Reserves other than those deducted from assets on balance sheet:					
Property insurance	8,000	500			8,500
Injuries and damages	353	450		395	408

NOTES:

(A) Deductions from reserves represent losses or expenses for which the respective reserves were created. In the case of uncollectible accounts reserve, such deductions are net of recoveries of amounts previously written off.

(B) Reserve provided by charges to various accounts on basis of materials issued.

SCHEDULE IX – SHORT-TERM BORROWINGS

For the Three Years Ended December 31, 1980
(Thousands of Dollars)

	Col. A	Col. B	Col. C	Col. D	Col. E	Col. F
Description	Category of Aggregate Short-term Borrowings	Balance at End of Period (A)	Weighted Average Interest Rate at End of Period	Maximum Amount Outstanding During the Period	Average Amount Outstanding During the Period	Weighted Average Interest Rate During the Period
Year Ended:						
December 31, 1980	Bank Loans	$ 20,000	21.00%	$ 75,000	$ 18,962	16.38%
	Commercial Paper	30,000	18.39	38,100	10,242	11.98
Year Ended:						
December 31, 1979	Bank Loans			62,000	10,112	13.69
	Commercial Paper			12,925	1,660	12.10
Year Ended:						
December 31, 1978	Bank Loans	1,000	11.75	96,000	41,570	8.50
	Commercial Paper			27,109	10,037	7.38

NOTES:

(A) The Balance at End of Period excludes land notes of $1,197, $1,084 and $870 as of December 31, 1978, 1979 and 1980, respectively.

SIGNATURES

Pursuant to the requirements of Section 13 or 15 (d) of the Securities Exchange Act of 1934, the registrant has duly caused this report to be signed on its behalf by the undersigned, thereunto duly authorized, in the City of Houston and State of Texas, on the 25th day of March, 1981.

HOUSTON LIGHTING & POWER COMPANY
(Registrant)

D. D. JORDAN
(D. D. Jordan, President)

Pursuant to the requirements of the Securities Exchange Act of 1934, this report has been signed below by the following persons on behalf of the registrant and in the capacities and on the date indicated.

Signature	Title	Date
D. D. JORDAN (D. D. Jordan, President)	Principal Executive Officer and Director	March 25, 1981
H. R. DEAN (H. R. Dean, Group Vice President)	Principal Financial and Accounting Officer and Director	
SEARCY BRACEWELL (Searcy Bracewell)	Director	
WM. R. BROWN (Wm. R. Brown)	Director	
JOHN C. ECHOLS (John C. Echols)	Director	
HOWARD W. HORNE (Howard W. Horne)	Director	
THOMAS B. McDADE (Thomas B. McDade)	Director	
G. W. OPREA, JR. (G. W. Oprea, Jr.)	Director	
STEWART ORTON (Stewart Orton)	Director	
WILLARD E. WALBRIDGE (Willard E. Walbridge)	Director	
JOE C. WESSENDORFF (Joe C. Wessendorff)	Director	

HOUSTON LIGHTING & POWER COMPANY

Exhibits to the Annual Report on Form 10-K
For the Fiscal Year Ended December 31, 1980

INDEX OF EXHIBITS

	– Exhibits not incorporated by reference to a prior filing are designated by an asterisk; all exhibits not so designated are incorporated herein by reference to a prior filing as indicated.
3(a)	– Articles of Incorporation of the Company, as amended February 1979. (Exhibit 2(a), File No. 2-63401).
*3(b)	– Copy of By-Laws of the Company, as amended October 1978.
4(b)(1)	– Mortgage and Deed of Trust, dated as of November 1, 1944, between the Company and South Texas Commercial National Bank of Houston (Texas Commerce Bank National Association, successor trustee), Trustee (Exhibit B-4, File No. 2-5515).
4(b)(2)	– First Supplemental Indenture to Exhibit 4(b)(1) (Exhibit 1 to 1948, Form 10-K).
4(b)(3)	– Second Supplemental Indenture to Exhibit 4(b)(1) (Exhibit 7D to April, 1950, Form 8-K).
4(b)(4)	– Third Supplemental Indenture to Exhibit 4(b)(1) (Exhibit 7E to October, 1951, Form 8-K).
4(b)(5)	– Fourth Supplemental Indenture to Exhibit 4(b)(1) (Exhibit 2(c), File No. 2-12263).
4(b)(6)	– Fifth Supplemental Indenture to Exhibit 4(b)(1) (Exhibit 2 to 1955, Form 10-K).
4(b)(7)	– Sixth Supplemental Indenture to Exhibit 4(b)(1) (Exhibit 2(c), File No. 2-15384).
4(b)(8)	– Seventh Supplemental Indenture to Exhibit 4(b)(1) (Exhibit 1 to August, 1959, Form 8-K).
4(b)(9)	– Eighth Supplemental Indenture to Exhibit 4(b)(1) (Exhibit 1 to 1962, Form 10-K).
4(b)(10)	– Ninth Supplemental Indenture to Exhibit 4(b)(1) (Exhibit 2(c), File No. 2-25829).
4(b)(11)	– Tenth Supplemental Indenture to Exhibit 4(b)(1) (Exhibit 2(c), File No. 2-27512).
4(b)(12)	– Eleventh Supplemental Indenture to Exhibit 4(b)(1) (Exhibit 2(c), File No. 2-28341).
4(b)(13)	– Twelfth Supplemental Indenture to Exhibit 4(b)(1) (Exhibit 2(c), File No. 2-32751).
4(b)(14)	– Thirteenth Supplemental Indenture to Exhibit 4(b)(1) (Exhibit 2(c), File No. 2-39257).
4(b)(15)	– Fourteenth Supplemental Indenture to Exhibit 4(b)(1) (Exhibit 3(f) to 1970, Form 10-K).
4(b)(16)	– Fifteenth Supplemental Indenture to Exhibit 4(b)(1) (Exhibit 3(f) to 1971, Form 10-K).

4(b)(17)	– Sixteenth Supplemental Indenture to Exhibit 4(b)(1) (Exhibit 2(c), File No. 2-50004).
4(b)(18)	– Seventeenth Supplemental Indenture to Exhibit 4(b)(1) (Exhibit 2(c), File No. 2-51731).
4(b)(19)	– Eighteenth Supplemental Indenture to Exhibit 4(b)(1) (Exhibit 2(c), File No. 2-52709).
4(b)(20)	– Nineteenth Supplemental Indenture to Exhibit 4(b)(1) (Exhibit 2(b)(1), File No. 2-57123).
4(b)(21)	– Twentieth Supplemental Indenture to Exhibit 4(b)(1) (Exhibit 3(a)(1) to 1976, Form 10-K of Houston Industries Incorporated).
4(b)(22)	– Twenty-First Supplemental Indenture to Exhibit 4(b)(1) (Exhibit 2 to 1977, Form 10-K).
4(b)(23)	– Twenty-Second Supplemental Indenture to Exhibit 4(b)(1) (Exhibit 2(d), File No. 2-62879).
4(b)(24)	– Twenty-Third Supplemental Indenture to Exhibit 4(b)(1) (Exhibit 1 to 1978, Form 10-K).
4(b)(25)	– Twenty-Fourth Supplemental Indenture to Exhibit 4(b)(1) (Exhibit 1 to 1979, Form 10-K).
*4(b)(26)	– Twenty-Fifth Supplemental Indenture to Exhibit 4(b)(1).
*4(b)(27)	– Twenty-Sixth Supplemental Indenture to Exhibit 4(b)(1).
10(b)(1)	– Gas sales contract, dated September 6, 1963, between the Company and Humble Oil and Refining Company (Exhibit 4(a), File No. 2-24599).
10(b)(2)	– Amendment to Gas Purchase Contract, dated May 29, 1974, between Exxon Company, U.S.A. and the Company, amending gas sales contract, dated September 6, 1963, between the Company and Humble Oil & Refining Company (Exhibit 1 to June 1974, Form 8-K).
10(b)(3)	– Gas sales contract, dated January 14, 1964, between the Company and United Gas Pipeline Company (Exhibit 4(b), File No. 2-24599).
10(b)(4)	– Amendment, dated September 6, 1972 to gas sales contract, dated January 14, 1964, between the Company and United Gas Pipeline Company (Exhibit 5(b), File No. 2-45327).
10(b)(5)	– Franchise granted by City of Houston, Ordinance No. 57-929, effective October 1, 1957, and acceptance by the Company of the same dated September 19, 1957 (Exhibit 5(c), File No. 2-59748).
10(b)(6)	– Letter agreement dated January 21, 1977 amending certain provisions contained in Exhibits 10(b)(3) and 10(b)(4) (Exhibit 5(d)(1), File No. 2-58113).
10(b)(7)	– Coal Supply Agreement, dated June 2, 1978, between Utility Fuels, Inc. and Spring Creek Coal Company (Exhibit 5(f), File No. 2-62291).
10(b)(8)	– Lignite Supply Agreement, dated August, 1979, between Utility Fuels, Inc. and Northwestern Resources Company (Exhibit 1 to August, 1979, Form 8-K of Houston Industries Incorporated).
10(b)(9)	– Coal Supply Agreement, dated April 18, 1980, between Utility Fuels, Inc. and Kerr-McGee Coal Corporation (Exhibit 1 to January-March 1980, Form 10-Q of Houston Industries Incorporated).
10(b)(10)	– Gas sales contract, dated January 19, 1981, between the Company and United Texas Transmission Company (Exhibit 1 to January, 1981, Form 8-K of Houston Industries Incorporated).

11	– None.
*12	– Computation of Ratios of Earnings to Fxed Charges and Earnings to Fixed Charges and Preferred Dividends.
13	– None.
19	– None.
20	– None.
22	– None.

Undertaking.

The undersigned, Houston Lighting & Power Company, hereby undertakes pursuant to Regulation S-K, Item 7, paragraph (b)(4)(c), to furnish to the Securities and Exchange Commission upon request all constituent instruments defining the rights of holders of long-term debt of Houston Lighting & Power Company not filed herewith for the reason that the total amount of securities authorized under any such instruments does not exceed 10% of the total assets of Houston Lighting & Power Company.

Houston Industries Incorporated

Houston Industries is the parent company of three subsidiaries: **Houston Lighting & Power Company** - HL&P is the nation's sixth largest electric utility in terms of kilowatt hour sales. It serves a 5,000-square-mile area which includes Houston, the nation's fifth largest city. **Primary Fuels, Inc.** - Primary Fuels is involved in the exploration for oil and gas offshore along the lower Texas Gulf Coast and onshore in the continental U.S. **Utility Fuels, Inc.** - Utility Fuels' principal efforts are directed toward the acquisition and delivery of fuels to electric generating plants. To date, it has operated primarily as a supplier and transporter of coal to HL&P.

About the Cover

Houston Industries' three subsidiaries are represented in the photos on the cover. A Houston Lighting & Power Company service truck (top), roughnecks changing pipe at a Primary Fuels/Shell Oil drilling rig (middle) and a Utility Fuels coal train streaking southward to HL&P's W.A. Parish plant.

The Report's Headlines

The quarterly dividend was raised in January 1980 to 67 cents per common share and increased again in January 1981 to 74 cents per share.

Net income was up 14 percent. However, earnings per share were down 3 percent on a 17 percent increase in the average number of common shares outstanding.

A three-for-two stock split has been recommended by the Board of Directors for approval by shareholders.

Houston Lighting & Power Company has revised its generating plant construction program.

HL&P was granted two rate increases by the Public Utility Commission of Texas.

HI Financial Highlights	1980	1979
Dividends Paid Per Share	\$2.68	\$2.36
Earnings Per Share	\$4.71	\$4.84
Net Income (thousands)	\$183,981	\$161,846
Return On Average Common Equity	13.6%	14.4%
Book Value Per Share (year-end)	\$35.14	\$34.62
Market Price (year-end closing)	\$28½	\$29⅛

To Our Shareholders:

Nineteen eighty was a successful year for Houston Industries even though earnings per share fell just short of 1979's performance.

Net income was up 14 percent to $184 million. The quarterly dividend per common share was increased from 59 cents to 67 cents in January. A second raise to 74 cents per share was made in January 1981 — a 25 percent increase in the two-year period.

However, earnings per share were down to $4.71, from $4.84 in 1979, as a result of a 17 percent increase in the average number of shares outstanding.

Financing has already begun in 1981. Most recently, three million shares of common stock were sold March 6 at $25.25. Substantial additional sales will be required in 1981, including common stock, bonds and preferred stock as market conditions allow.

The Board Has Recommended a Three-for-Two Stock Split

In the belief that a lower per share market price will make the stock more attractive and broaden our investor base, the Board of Directors has recommended a three-for-two split of HI's common stock.

If approved by shareholders at the annual meeting May 13, an additional share of common stock will be issued to shareholders for every two they own as of May 26.

The following pages will discuss significant developments that affected Houston Industries in 1980. Several areas, however, deserve special mention here.

Five Planned Generating Units Have Been Moved Back Two Years

The company's long-standing program of monitoring conditions affecting its corporate development has brought about a rescheduling of generating plant construction.

Completion of four lignite units originally scheduled to go on line in the years 1985, 1986, 1987 and 1988 has been deferred for two years. The Allens Creek Nuclear Generating Station, formerly scheduled to be completed in 1989, is now scheduled to go in service in 1991.

The scheduled completion dates of three units now under construction — a western coal-fired unit and two nuclear units that comprise the jointly-owned South Texas Project — are not affected by the revision.

Outlay for the former construction program was estimated at $3.3 billion for the three-year period 1981-1983. The two-year deferment will reduce the estimated cost to $2.4 billion, a sum which will still require very substantial rate relief as well as the raising of large amounts of capital in a period of highly volatile market conditions.

The concerns of Moody's Investors Service regarding our ability to finance the former construction program led them to downrate HL&P's first mortgage bonds and preferred stock in November from Aa to A. These securities continue to be rated the equivalent to double A by the other major rating services, Standard & Poor's Corporation and Fitch Investor's Service.

The rescheduling of new generating capacity has certain attendant risks because of the area's continuing load growth and the long lead times needed to bring new units into operation. Factors affecting the need for new units include rate of system load growth, fuel supplies, governmental regulations and effect of customer conservation.

The company will be continually monitoring all factors influencing its corporate development program and will make appropriate adjustments to its generating construction program as circumstances may dictate.

Meeting the area's electric power requirements in the 1980's will require these actions:

* An aggressive load management program to restrain growth in peak electrical demand must be expanded and implemented.
* The provisions of the Fuel Use Act of 1978 prohibiting the burning of natural gas after 1990 must be relaxed.
* Substantial amounts of power from other electric utility systems in the State must be purchased.
* Rate adjustments to support construction of additional generating capacity and maintain the company's financial integrity must be obtained.

Load Management Will Be Essential to Meeting Area Power Requirements

An on-going, effective load management program is absolutely essential. An expansion of earlier programs resulted in the formation of a Load Management Department in 1980 to coordinate all load management activities. A program to reduce system voltage during critical load periods is under development and rate studies designed to encourage industrial customers to reduce their demands during periods of peak system loads are being conducted. These two programs appear to have the potential of substantially reducing system peak demand. Several other programs are under study.

The 1990 Cutoff Date for Gas Is Unrealistic and Unattainable

The 1990 date for termination of natural gas use mandated by the Fuel Use Act is unrealistic and unattainable. The company will continue to seek modifications of the Act to permit the use of natural gas throughout the useful life of existing gas units. Such relaxation will be in the best interests of electric service users and the nation, since it would eliminate the necessity of using substantial amounts of oil to replace natural gas.

Agreements have been signed with two Texas systems for purchase of substantial amounts of power through 1987. The changes in the construction program will require the company to buy more power from neighboring systems. Studies are now under way to determine availability of this power.

The New Administration's Support for Nuclear Power Is Encouraging

The new Administration's early pronouncement of support for nuclear energy gives encouragement for the further development of this critically needed energy resource.

Despite the delays and cost increases which have occurred in the construction of the South Texas Project, studies show that it will produce electricity at a lower cost than a fossil-fueled plant operating in a comparable time frame.

The Nuclear Regulatory Commission has allowed the restart of certain construction activities at STP that were temporarily suspended in 1980. Full construction activity is expected to be re-established in the second quarter of 1981.

Hearings on the company's request for a construction permit for Allens Creek are now in progress. They are expected to last through mid-1981. The granting of a construction permit is anticipated in 1982.

An on-going program to improve operating efficiency and lower costs will continue in 1981. A system-wide study of operations was completed in 1980, and led to a number of changes to improve performance. Another program, which seeks to improve availability and operating efficiency of generating units has already produced tangible results.

A number of organizational changes have been made to strengthen the company's management staff. New vice presidents were named for both Primary Fuels, Inc., and Utility Fuels, Inc., and staffing for these subsidiaries has been increased significantly. Mr. William Will, vice president of Primary Fuels, died unexpectedly in February 1981 and his leadership at PFI will be greatly missed.

The electric utility industry will face unprecedented problems during the decade of the 1980's. The continuing growth experienced in the Texas Gulf Coast area coupled with the need to convert our generating fuel mix from gas and oil to coal and nuclear will require large investments in new plant facilities. Our ability to obtain capital will in large part determine the completion schedule of these facilities.

The company's employees are dedicated to the future development of Houston Industries and we appreciate your support.

Don D. Jordan
President and
Chief Executive Officer

Houston, Texas
March 27, 1981

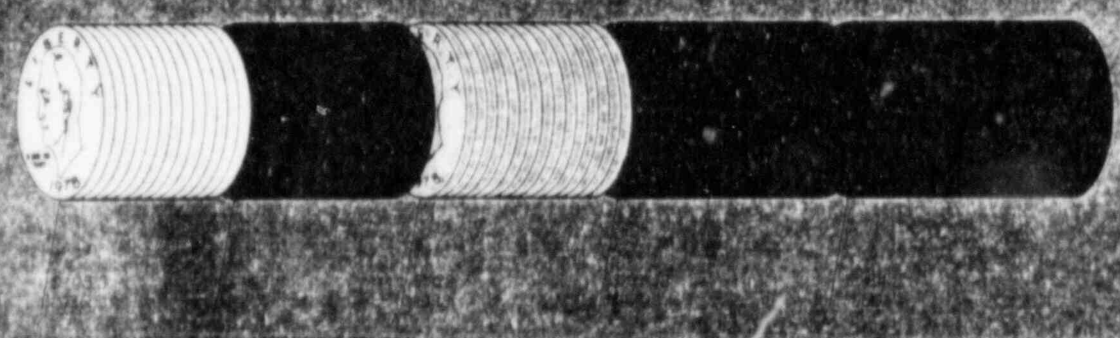
HI's Financial Picture

Houston Industries' 1980 earnings were $[illegible]84 million, an increase of 14 percent over the previous year. Revenues rose 28 percent to $2.4 billion. However, earnings per share were down 3 percent, from $4.84 in 1979 to $4.71, because the average number of shares outstanding increased 17 percent.

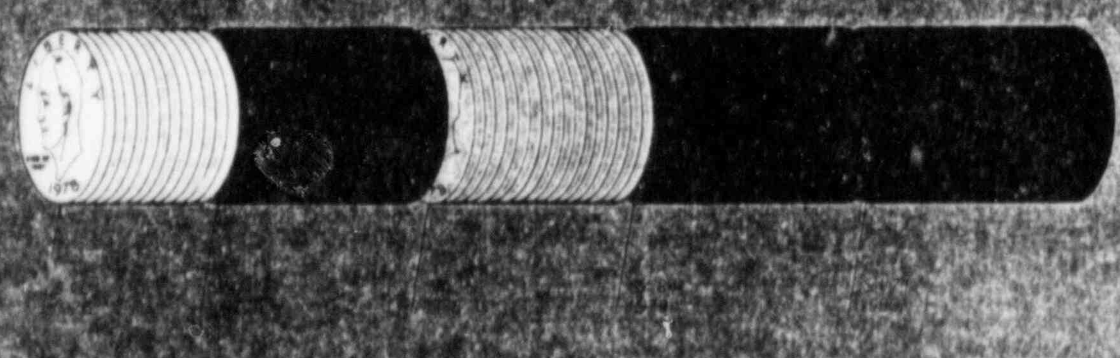
HI's improved net income resulted from a 21 percent increase in Houston Lighting & Power Company's earnings to $177.8 million.

HL&P contributed 90 percent of Houston Industries' revenues and 96 percent of its consolidated net income. HL&P's revenues rose to $2.1 billion as a result of rate

Net Income (Millions)



Earnings Per Share



increases granted [illegible] recovery of increased fuel costs and a 4.7 percent increase in kilowatt-hour sales.

Increased fuel costs were the principal factor in the 24 percent increase in HL&P's fuel expense to $[illegible] billion. Fuel costs amounted to 57 cents of each dollar of [illegible]

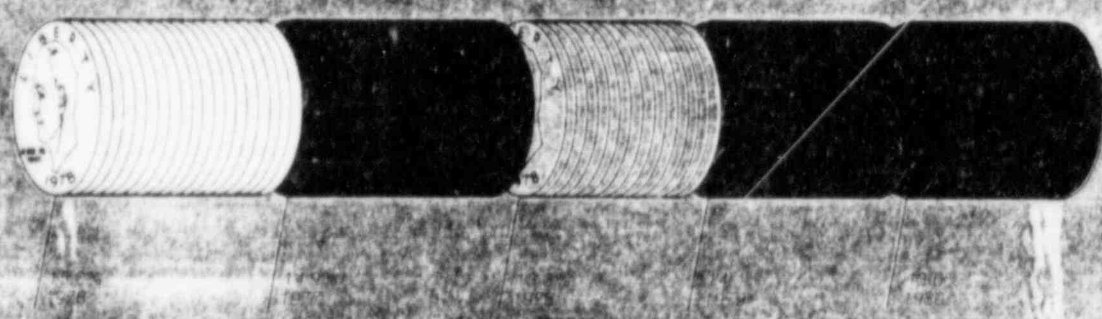
[illegible]

affected by higher general and administrative expenses, reduced interest income and the absence of uranium sales in 1980.

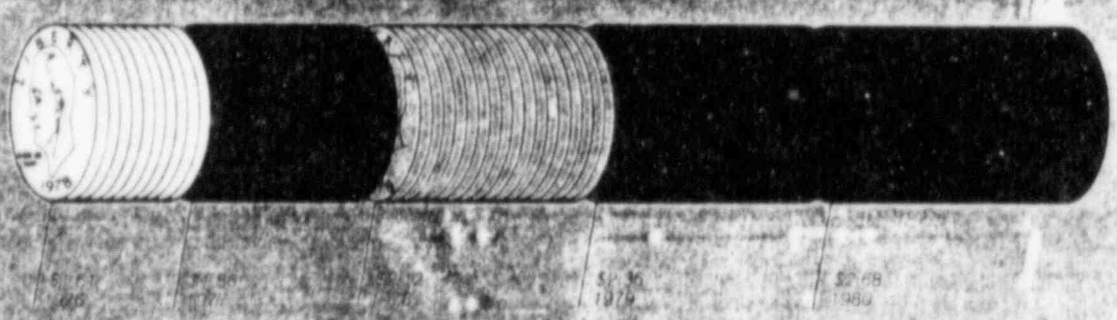
HI's return on average common equity was 13.6 percent, which compares to the electric utility industry's average of 11.3 percent. However, this was down from 1979's 14.4 percent. HI's book value per common share increased to $35.14 from $34.62 in 1979.

The price per share of HI's common stock on the New York Stock Exchange reached a high for the year of $31[illegible] January 11 and a low of $24[illegible] February 28. Yield on a share of common stock was 9.4 percent at year's end.

Return On Average Common Equity



Dividends Paid Per Share of Common Stock



We Increased the Dividend

Houston Industries has maintained one of the highest dividend growth rates in the electric utility industry in the past decade. In January 1980 the quarterly dividend was increased to 67 cents per common share. In January 1981 it was increased again to 74 cents per share, equal to an annual rate of $2.96 per share.

Including the latest increase, the quarterly dividend has been raised six times since the middle of 1975, from 39 cents a share to the current 74 cents.

During the 10-year period 1970-1980 Houston Industries had the third largest increase in dividend payments in the electric utility industry, according to a survey by a New York Stock Exchange firm. HI's annual dividend rate rose 128.3 percent during the decade.

Our Dividend Reinvestment Gained in Popularity

Houston Industries' dividend reinvestment plan continues to grow in popularity. At year's end 5,660 shareholders, or 15 percent of all owners of HI common stock, were participating in the plan. This is a 17 percent increase from the number of shareholders who participated in 1979.

Shareowners may reinvest quarterly dividends and/or make optional cash payments of $50 to $3,000 each quarter for more shares. For information on the plan write: Ms. Ann Cherry, Vice President and Trust Officer, Texas Commerce Bank, P.O. Box 2558, Houston, Texas 77001.

A bill has been reintroduced in the Congress which basically would allow deferment of taxes on the first $1,500 per year ($3,000 for a joint return) of reinvested dividends. Reinvested dividends have been taxed as ordinary income. Houston Industries is strongly supporting this proposal.

We Were Granted Two Rate Increases

HL&P was granted two rate increases in 1980. The latest was placed into effect in October after a September 12 settlement among HL&P, the Public Utility Commission of Texas (PUC) and a number of intervenors. HL&P had asked the PUC and the cities it serves for a $214 million rate increase June 30.

The PUC approved new rates designed to increase HL&P's annual operating revenues by about $135 million and granted a 15.8 percent return on common equity. It also allowed 72 percent of construction work in progress and nuclear fuel in process at the end of the test year to be included in the rate base.

The PUC also approved an economy rate for low-volume residential users. If they use 500 kilowatt hours or less during the summer months they will be billed on the lower winter rate.

In January, 1980 the PUC granted the company an $82 million increase, or about 46 percent of the $179 million requested July 2, 1979. The order also provided for a 15 percent return on common equity and allowed 60 percent of construction work in progress and nuclear fuel in process in the rate base.

Considering the increases the PUC has allowed and the huge capital needs of HL&P's construction program, the company expects to request rate increases at least once a year in the 1980's.

PUC Rate Case Decisions

Requested	Amount	Return on Equity	Granted	Amount	Return on Equity
July 1978	$175 million	15.8%	November 1978	$98 million	13.8%
July 1979	$179 million	15.5%	January 1980	$82 million	15%
June 1980	$214 million	16%	October 1980	$135 million	15.8%

Our Financing Was Limited

Unfavorable market conditions and a downrating of HL&P's first mortgage bonds and preferred stock by one rating agency limited financing in 1980.

Houston Lighting & Power Company sold $100 million of 12% 30-year first mortgage bonds in June. However, in December HL&P cancelled the sale of $35 million of preferred stock and deferred the sale of $125 million of 30-year first mortgage bonds to await more favorable market conditions.

Moody's Investors Service had downrated HL&P's first mortgage bonds and preferred stock from Aa to A the previous month, mostly because of its concern about the company's ability to finance its former construction program in the mid-1980's. Standard & Poor's Corporation and Fitch Investor's Service still rate HL&P's bonds and preferred stock the equivalent to double A.

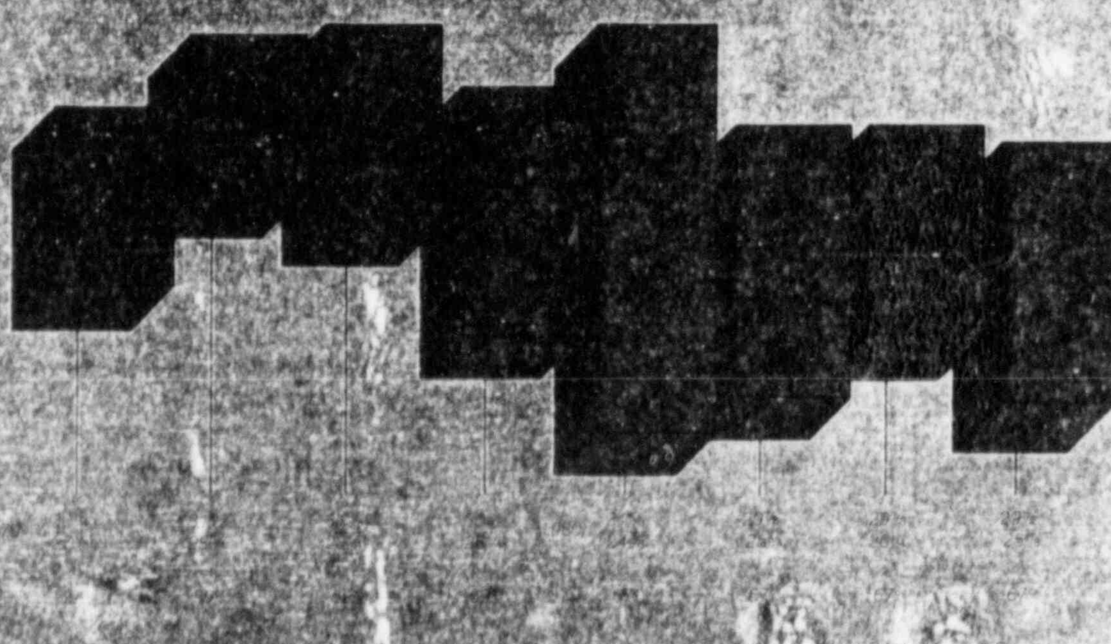
In February 1981, HL&P changed the terms of its $125 million issue of first mortgage bonds to mature in 10 years. The bonds were sold at an interest rate to yield 14.04%.

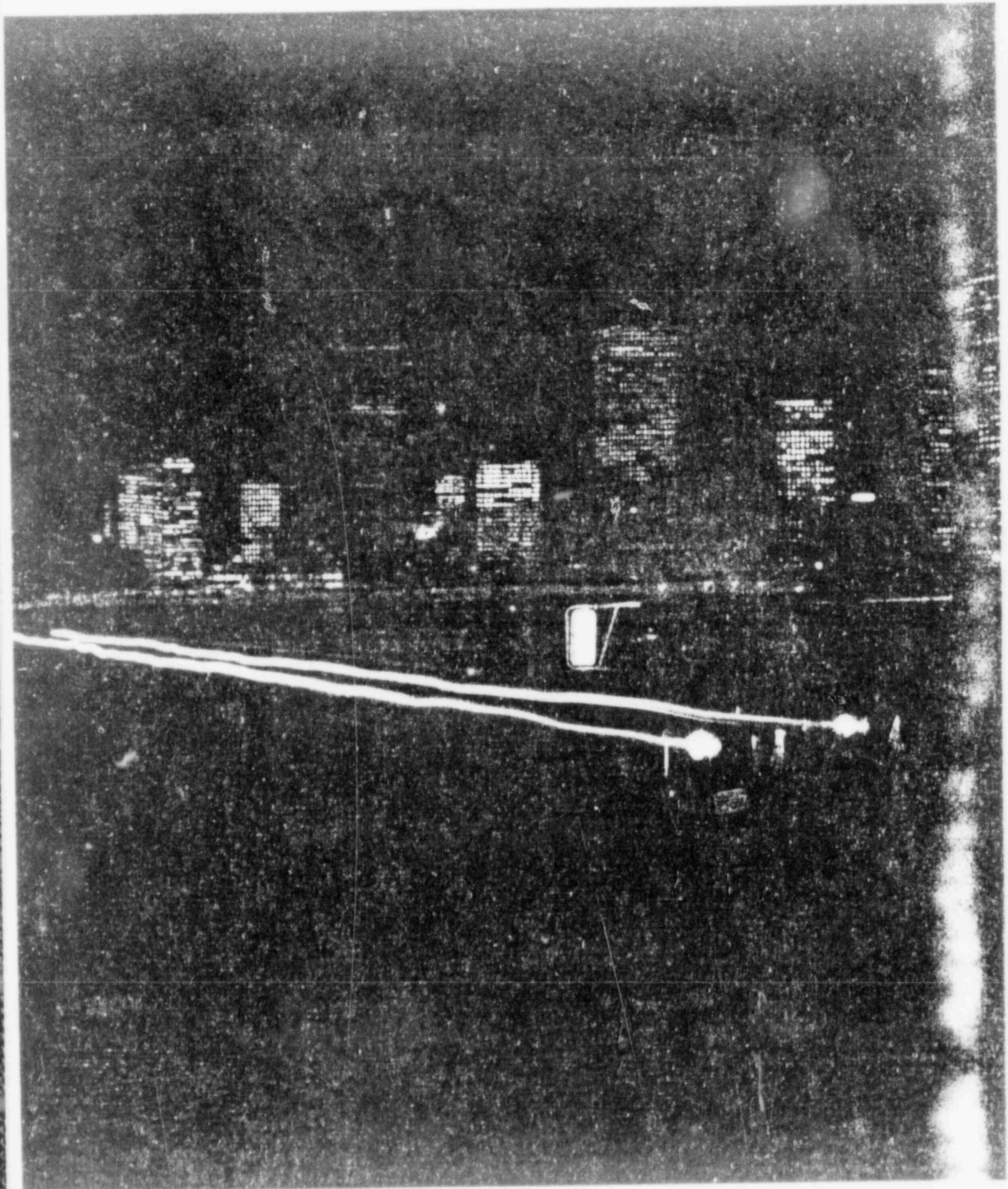
Houston Industries sold three million shares of common stock in April at a price to the public of $27[illegible] per share and another three million shares in October at $26[illegible].

In March 1981, it sold another three million shares of common stock at a price to the public of $25[illegible].

Because of HI's substantial capital needs more sales of debt and equity will be made in 1981 as market conditions allow.

Quarterly High and Low Sale Prices on the New York Stock Exchange and Composite Tape





Houston Lighting & Power Company

According to the United States Census Bureau's 1980 census, the region which largely makes up HL&P's service area led the nation in population gain this past decade. HL&P's operations reflect this growth. During 1980 the company added nearly 67,000 individually metered customers and connected its one millionth customer in June.

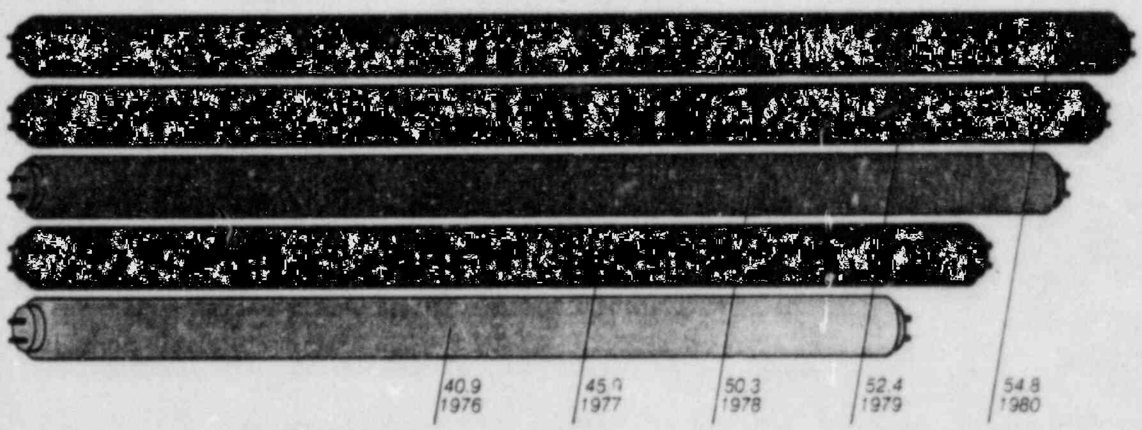
The area's hottest summer since the advent of the general use of air conditioning spurred greater usage than had been expected and masked increasing efforts customers are making to conserve.

Gains in residential and commercial consumption in 1980 were accentuated by the fact that 1979 was the second mildest summer in the last five years. About 93 percent of HL&P's customers have air conditioning. Therefore, its heavy use has a major impact on sales.

Overall kilowatt hour sales were up 4.7 percent, led by a 13.4 percent increase in residential and a 5.8 percent rise in commercial sales. Average annual usage per residential customer was up 5.2 percent to 14,219 kwh. This is nearly 59 percent above the national average. Average residential revenue per kwh rose to 5 cents from 4.09 cents in 1979. Nineteen seventy-nine's residential sales were up only 1.1 percent and average usage per residential customer was down 8.2 percent.

However, the overall increase in 1980 was held down by a modest rise of 1.2 percent in industrial usage. Industrial customers accounted for 54 percent of the company's kilowatt hour sales. The small increase, down from 1979's 5.4 percent gain, was a result of the effect of the nation's depressed economy on area businesses.

Kilowatt Hour Sales (Billions)



A new high demand during a one-hour period of 10,266,000 kilowatts was set August 22, a 10 percent increase over 1979. This is the greatest jump in peak demand since 1976 and nearly four times the increase the country recorded. HL&P's peak demand was up 2.4 percent in 1979.

However, the company doesn't expect the 1980 increase to be typical of what will occur in this decade. The service area's population growth and industrial activity are expected to moderate. More customers are also expected to conserve. For these reasons and the fact the company plans to pursue an aggressive load management program, it calculates demand will increase at a compound annual rate of 3 to 4 percent in the 1980's. This growth rate averaged 8 percent in the 70's.

Business Activity Weathered Recession

Despite the general downturn in the economy, 22 major industrial projects are under construction with scheduled completion dates in 1981 and 1982. Another 40 projects are being considered by their respective companies.

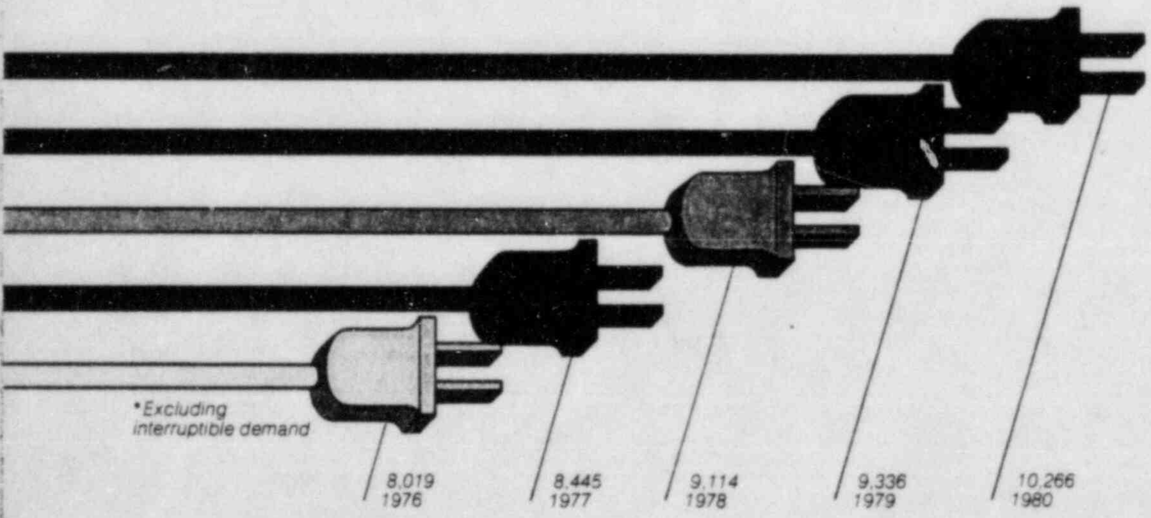
Home construction was down 45 percent from 1979, with approximately 16,000 homes completed. However, Houston still led the nation in home building in 1980. The drop was basically a result of high interest rates and tight money. Apartment construction, including condominiums and townhouses, however, remained strong in Houston. The outlook for residential construction in 1981 will depend much on interest rates.

In the commercial sector, office building construction activity continues to reflect the vitality of the area's economy. More than nine million square feet of office space was completed in Houston alone. Several large office buildings are under construction. They are topped by the 75-story Texas Commerce Tower. Others are the 70-story Allied Bank Place, the 65-story Transco Tower, the 50-story Three Allen Center and the 47-story First City Tower. Except for the new Transco Tower, all these buildings are in the downtown business district.

We've Made Major Decisions on Construction

Because of the compelling need to reduce construction outlays, the company decided March 1981 to extend the in-service dates of five of its planned generating units. The

*Peak Demand Growth (Megawatts)**



*Excluding interruptible demand

scheduled completion dates of four lignite units and the Allens Creek nuclear unit have been moved back two years.

These extensions reduced the construction budget for the three years 1981 through 1983 to $2.4 billion from $3.3 billion. In 1981 the company projects it will spend $691 million under the revised program. HL&P spent $637 million for construction in 1980.

However, these extensions also result in increases in the estimated completion costs of the five units. The projected cost of Limestone Units 1 and 2 has been increased $159 million. The estimated cost of HL&P's other two lignite units has been raised by $382 million. And the projected cost of Allens Creek went up by $230 million. The company will be closely monitoring factors affecting the revised construction program and will make appropriate adjustments as circumstances may dictate.

HL&P plans to complete 3,480 megawatts of coal and lignite and 1,970 megawatts of nuclear capacity in the next 11 years. It increased its generating capacity to 11,607 megawatts in June when it completed a third coal-fired generating unit.

Lignite Units Planned

HL&P has four lignite units in the planning stage. Site X, as it is now called, will have two 690-megawatt units scheduled for completion in 1989 and 1990 at an estimated cost of nearly $1.9 billion. The lignite will come from deposits near the plant. Utility Fuels is expected to supply the lignite with a third party doing the actual mining. A site for the plant will be announced in 1981.

Groundbreaking on the company's other two lignite units is scheduled for 1981. The Limestone Electric Generating Station will have two 750-megawatt generators scheduled for completion in 1987 and 1988. The Limestone plant site is in Limestone County, about 120 miles northwest of Houston.

Coal Unit Progressing

A fourth coal-fired unit at the W.A. Parish plant southwest of Houston is on schedule. Unit 8, a 600-megawatt generator, is scheduled for completion in 1983. Unit 8 will differ from the other three coal-fired units in that it will have a flue gas desulfurization system or "scrubber."

Allens Creek Making Headway

A long-awaited public hearing on construction of the Allens Creek nuclear generating station began January 12, 1981.

Service Area Map
Population Scale

A 1,200-megawatt reactor to be located about 45 miles west of Houston, Allens Creek has experienced many delays. Some have been caused by the obstructive motions of people opposed to the plant and the lack of licensing action by the Nuclear Regulatory Commission after the accident at Three Mile Island.

The hearing is in the first of two phases. The proposed site and surrounding environment are being considered in the first phase. Public health and safety questions will be considered in the second phase.

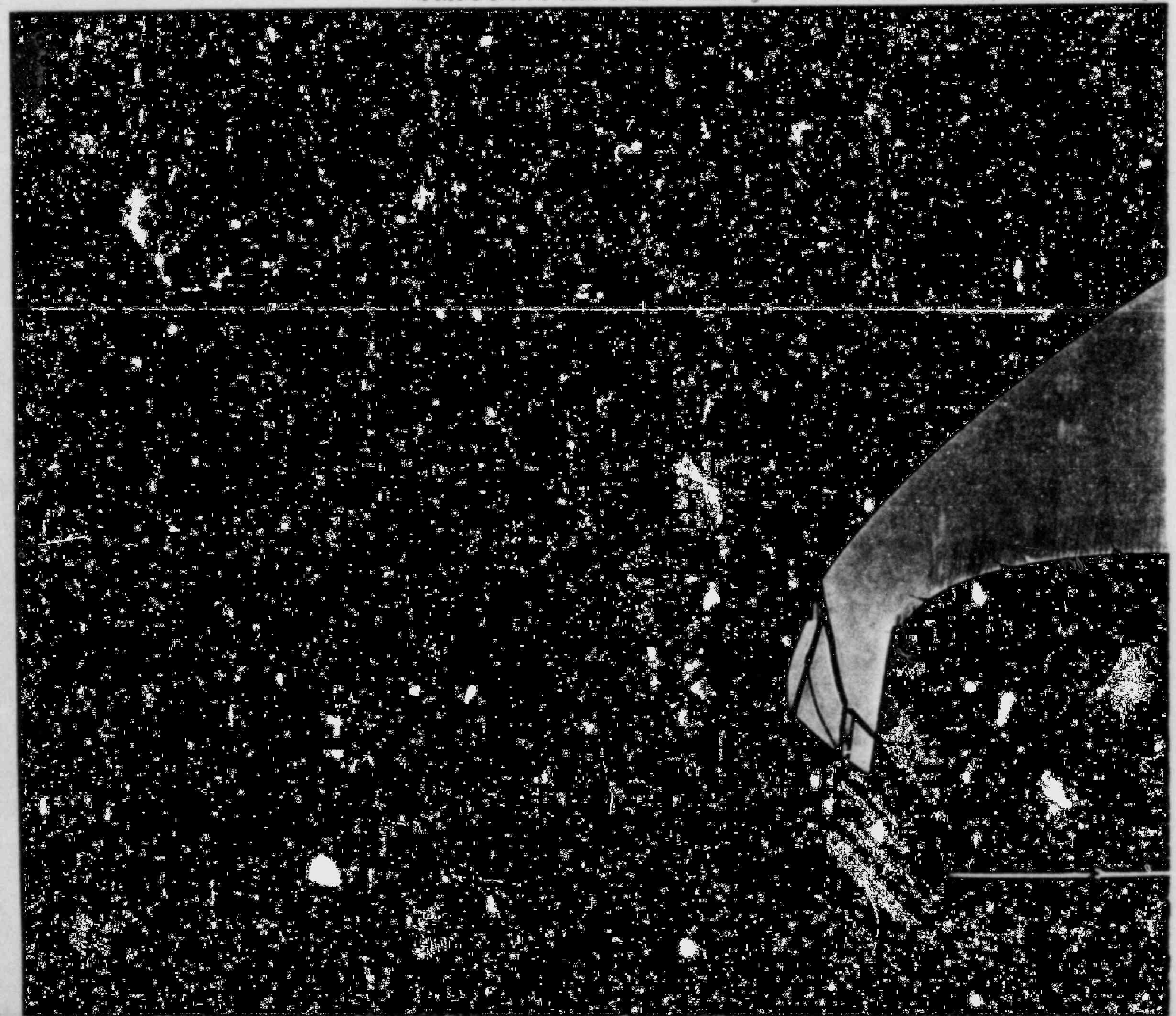
The hearing will extend past mid-1981. HL&P hopes to get a construction permit in 1982. The $2.1 billion plant is scheduled to be operational in 1991.

South Texas Project Moving

Welding and complex concrete pours have resumed at the South Texas Project (STP) after being voluntarily stopped early in 1980.

STP is about 80 miles southwest of Houston in Matagorda County. The $2.7 billion plant is jointly-owned with Central Power and Light Company and the cities of Austin and San Antonio. HL&P is project manager and will receive nearly 31 percent of the electricity from the plant's two 1,250-megawatt units. The units are scheduled to be

The steel shell of the reactor containment building for Unit 2 of the South Texas Project rises in the backgro



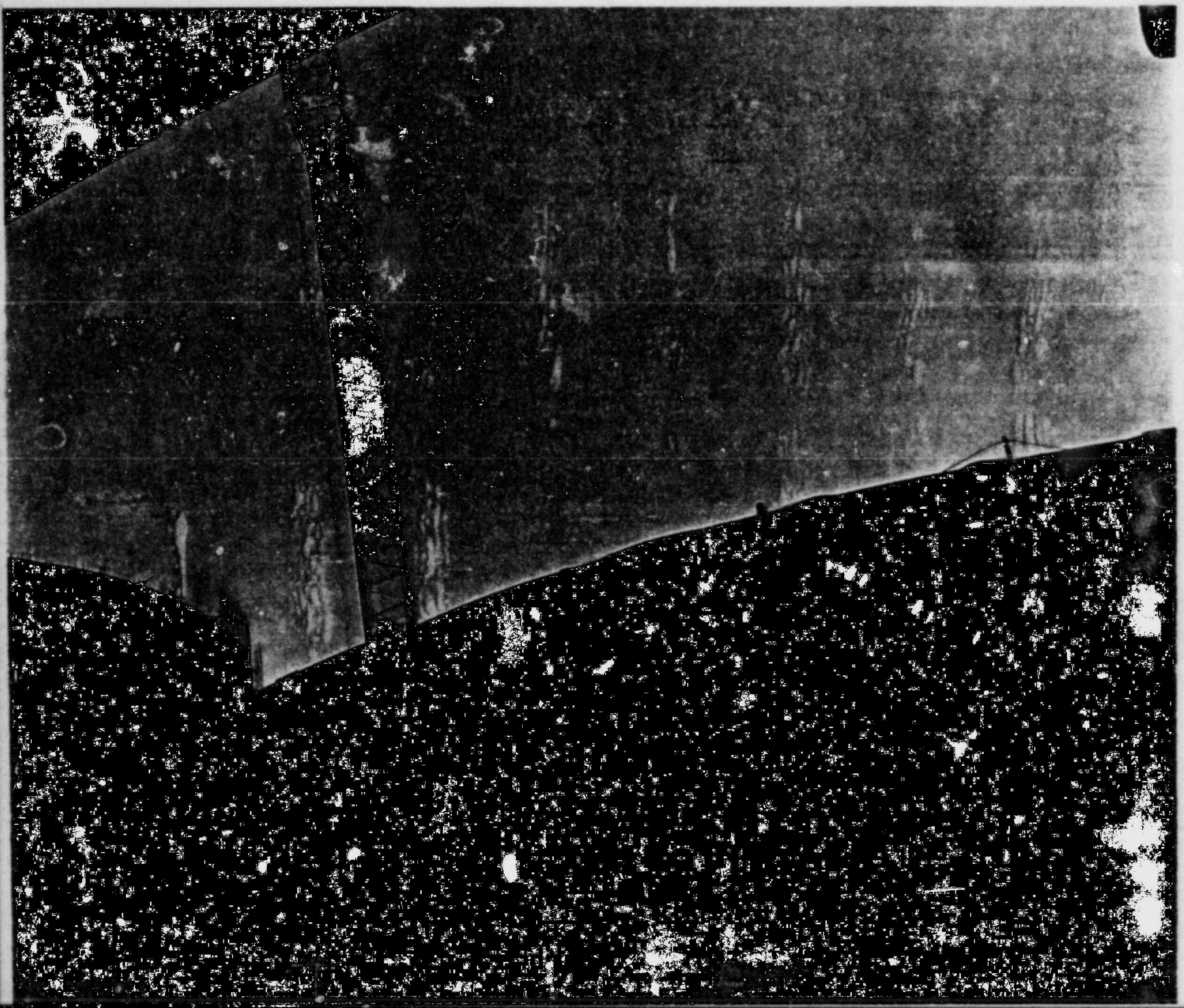
operational in 1984 and 1986. However, the validity of these dates and STP's current estimated completed cost are now being evaluated, in light of the effects the suspension of work has had on the project. The study will be completed in mid-1981.

On April 30 the NRC ordered HL&P to show cause why safety-related work should not be stopped until the company addressed NRC concerns about the plant's quality assurance program.

The order was prompted by an NRC investigation it made in late 1979 and early 1980 of the effectiveness of the project's quality assurance/quality control program. The report stated that the program was not complying with commission standards. As a result, the NRC fined HL&P, as holder of the construction license of the plant, $100,000 which was paid May 23.

During the investigation HL&P and the plant's builder, Brown and Root, Inc., voluntarily stopped complex concrete pours after problems were identified with some pours. Complex concrete pours are placements in areas where at least 50 percent of the volume is reinforcing steel. After more review, safety-related structural and pipe welding was also voluntarily halted in April.

In the foreground is the cap that will be placed on top of the building.



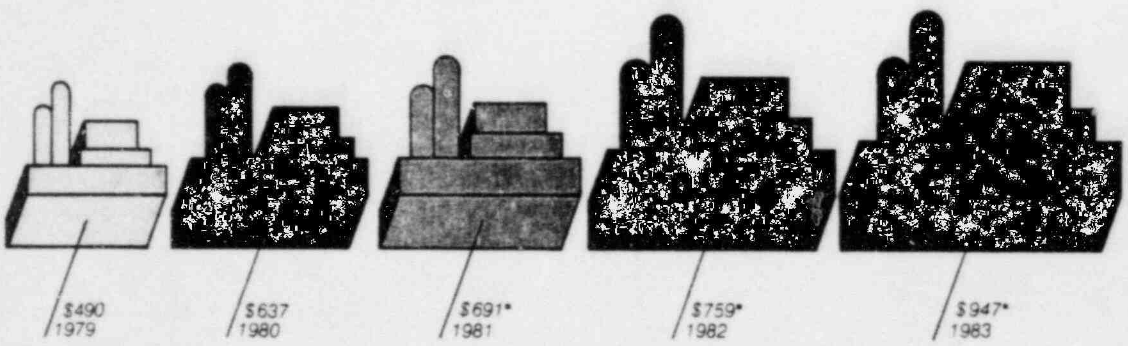
Since that time there have been a number of encouraging developments. In July HL&P answered the NRC order stating it and Brown & Root had made major changes in their organization, personnel and procedures to assure STP construction practices are in accordance with NRC requirements.

The NRC acknowledged, at a public meeting it held in August to discuss the company's response, that HL&P and Brown & Root were making substantial progress toward an improved quality control program at STP.

Executive Vice President George Oprea, Jr., who was responsible for activities surrounding power plants and fuel acquisition, was reassigned to devote all his energies to overseeing the company's nuclear activities.

Later in the year, Jerome Goldberg, who has more than 20 years' experience in engineering and construction of nuclear facilities, was hired as vice president of Nuclear Engineering & Construction. He reports to Oprea with direct responsibility for STP and other nuclear activities.

Construction Expenditures (Millions)



*Projected

In October the NRC allowed HL&P to restart limited structural welding and lifted all limitations on such welding in January 1981. Later that month it permitted resumption of pipe welding and complex concrete pours with some limitations.

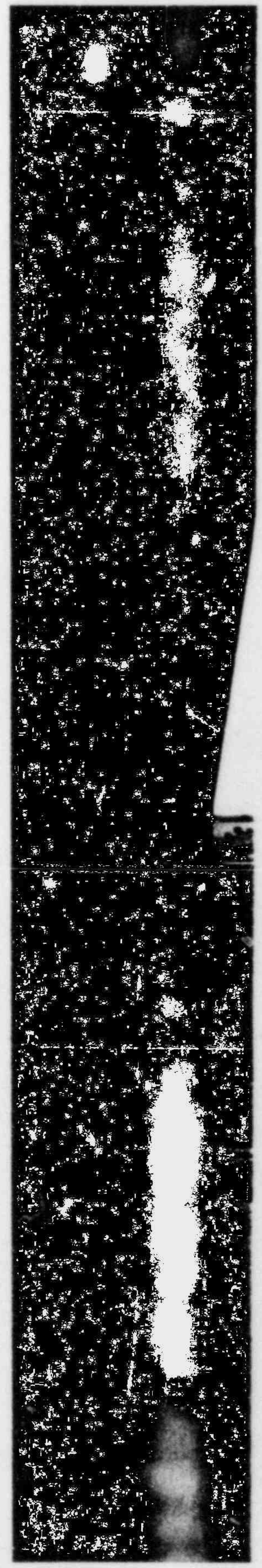
NRC licensing hearings will begin in May to further review the quality of construction at STP and the actions taken in response to the commission's show cause order. The hearing will also air the results of an NRC inspection of HL&P's STP operations on and off the site.

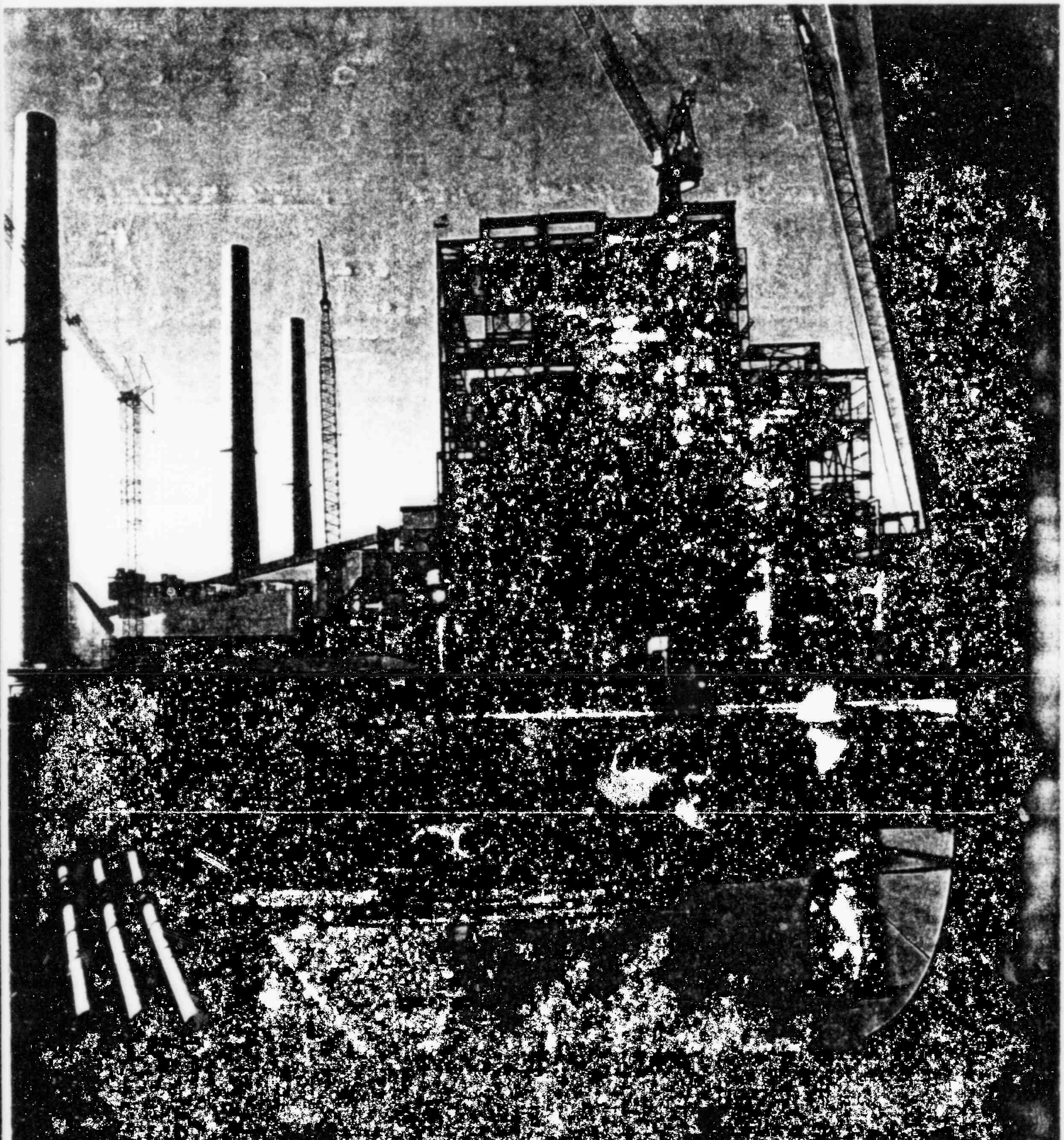
The company looks forward to work on STP without any limitations in the second quarter of 1981.

Generating Plant Construction Program

Plant	Estimated Unit Capacity (MW)	Fuel	Scheduled In-Service Date*	Estimated Completed Cost (millions)
W. A. Parish No. 8	600	Coal	1983	$ 408
South Texas No. 1	385**	Nuclear	1984	832
South Texas No. 2	385**	Nuclear	1986	
Limestone No. 1	750	Lignite	1987	1,600
Limestone No. 2	750	Lignite	1988	
Site X No. 1	690	Lignite	1989	1,870
Site X No. 2	690	Lignite	1990	
Allens Creek	1,200	Nuclear	1991	2,090

* Year plant will be available for peak demand season.
** HL&P's 30.8% interest in the jointly-owned plant.





HL&P's fourth coal-fired unit is moving toward a 1982 completion date

Our Fuel Mix Is Changing Rapidly

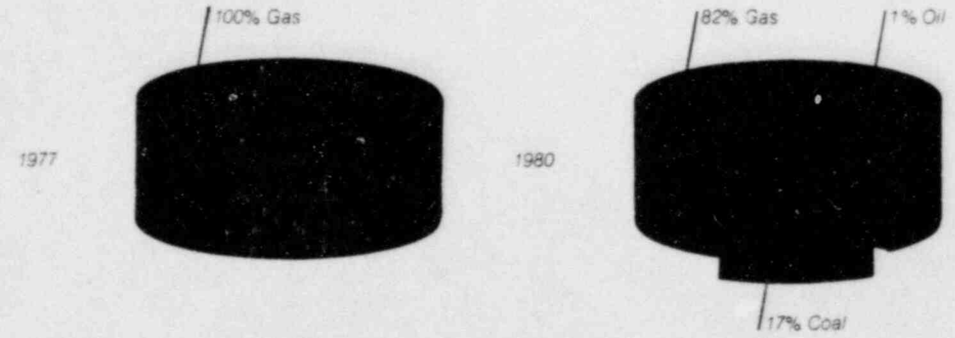
HL&P is moving steadily in its efforts to convert its fuel mix from one formerly based entirely on natural gas to coal, lignite and uranium. The Fuel Use Act of 1978 prohibits the company from using gas as a boiler fuel after Dec. 31, 1989 except where some exemptions apply.

HL&P is strongly supporting legislation to amend the Act so natural gas can be burned in existing gas-fired plants through their useful life. The projected fuel mix for 1990 assumes that the Act will be amended.

Coal and lignite are going to play a greater role in the fuel mix in the 1980's. HL&P burned nearly 5.8 million tons of coal in 1980 to account for 17 percent of its fuel mix.

In July Utility Fuels began delivering coal to HL&P from a Spring Creek Coal Company mine near Decker, Montana. HL&P's other source of western low-sulfur coal is a Kerr-McGee mine near Gillette, Wyoming. When its fourth coal-fired unit becomes operational in 1983, HL&P expects to be burning about eight million tons of coal a year, which will be 23 percent of the fuel mix that year.

HL&P Fuel Mix



Coal transportation costs continue to be of concern to HL&P. During 1980 coal hauling rates charged by Burlington Northern railroad from Wyoming rose from $17.93 to $21.70 a ton, almost twice the cost of the coal at the mine. Burlington Northern was charging $22.73 a ton at the end of the year to haul the Montana coal.

In February the company was denied a hearing by the U.S. Supreme Court on its appeal of increased rates imposed by Burlington and approved by the Interstate Commerce Commission.

The company's plans to use Texas lignite at mine-mouth plants will provide some relief from high coal hauling rates.

When all four lignite units are operational in 1990, HL&P expects to be burning about 13 million tons of lignite a year. Together, coal and lignite are projected to account for 38 percent of HL&P's fuel requirements that year.

Oil's share of the fuel mix is not expected to change significantly as long as adequate supplies of natural gas are available. Oil will represent a small percentage of the fuel mix in the 1980's.

Uranium will not become a factor in HL&P's fuel mix until 1984. By 1990, uranium is projected to represent a 6 percent share of the fuel mix.

The percentage of natural gas in fuel mixes of the 80's will gradually decrease as other solid fuel units are brought on line.

The average cost of fuel continued to rise in 1980, from $1.71 per million BTU in 1979 to $2.06 in 1980. Fuel costs are expected to continue to rise in the 80's.

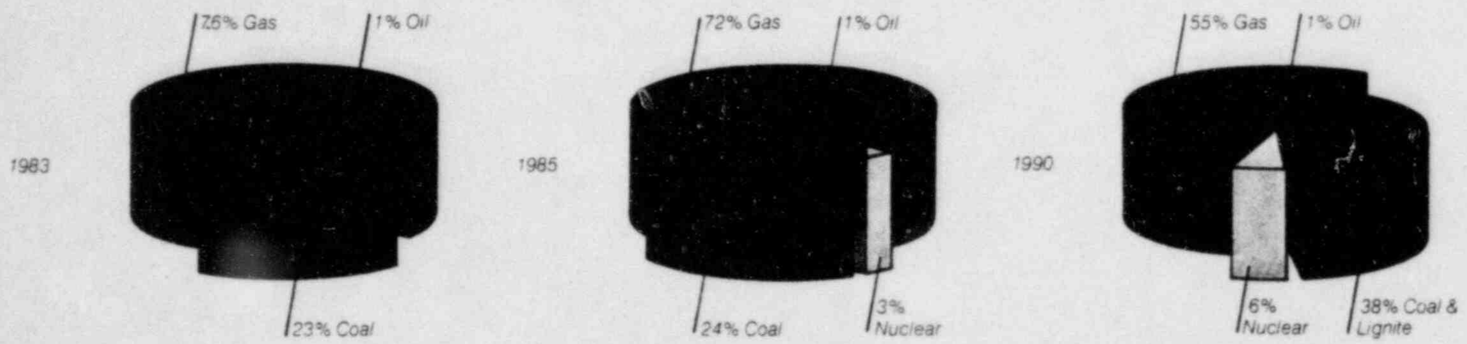
We Must Buy Power in the 80's

HL&P will have to purchase substantial amounts of power to maintain acceptable reserve margins during most of the 1980's.

This has come about as a result of delays in scheduled completion dates of a number of generating units and the extension in the in-service dates of five of HL&P's generating units. The company has considered 15 percent an adequate reserve to ensure reliability.

To maintain at least this level, the company has entered into purchased power agreements with two Texas utilities. In July HL&P signed a contract with City Public Service of San Antonio to purchase varying amounts of generating capacity over a six-year period on an as-needed basis. HL&P can buy 200 to 500 megawatts of capacity during the years 1982 through 1987.

In December the City of Austin agreed to increase the generating capacity available to HL&P from 500 megawatts stipulated in an earlier agreement to 800 megawatts, and to extend the former agreement two years through 1987. HL&P bought substantial amounts of energy from Austin during the record hot summer.



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Both contracts serve the same purpose as if the capacity were installed on HL&P's system. The company is now looking for more sources of purchased power for the late 80's.

Load Management Is A Top Priority

Pursuit of an aggressive load management program has become critically important to HL&P, in light of the changes in its construction program.

Successful load management and energy conservation programs can help hold down peak demand growth which reduces construction costs and financing.

Recognizing this, a Load Management Department was formed in June to work full time developing programs to control peak demands beyond those the company has employed. The department is now actively considering 19 separate programs for controlling peak demands.

A voltage reduction program will be started in the summer of 1981. It will be implemented only during critical load periods. Voltage reduction is expected to lower peak demands by 250-300 megawatts.

The department has begun an experimental program called "SHED." Radio commands from HL&P's Energy Control Center will raise settings of set up/set back thermostats installed in a test group of homes and businesses during hours of peak usage in the summer of 1981 to reduce air conditioning loads. Its effectiveness in lowering demand will be evaluated after the summer.

In November the department began studying how large building air conditioning loads can be controlled without adversely affecting comfort levels.

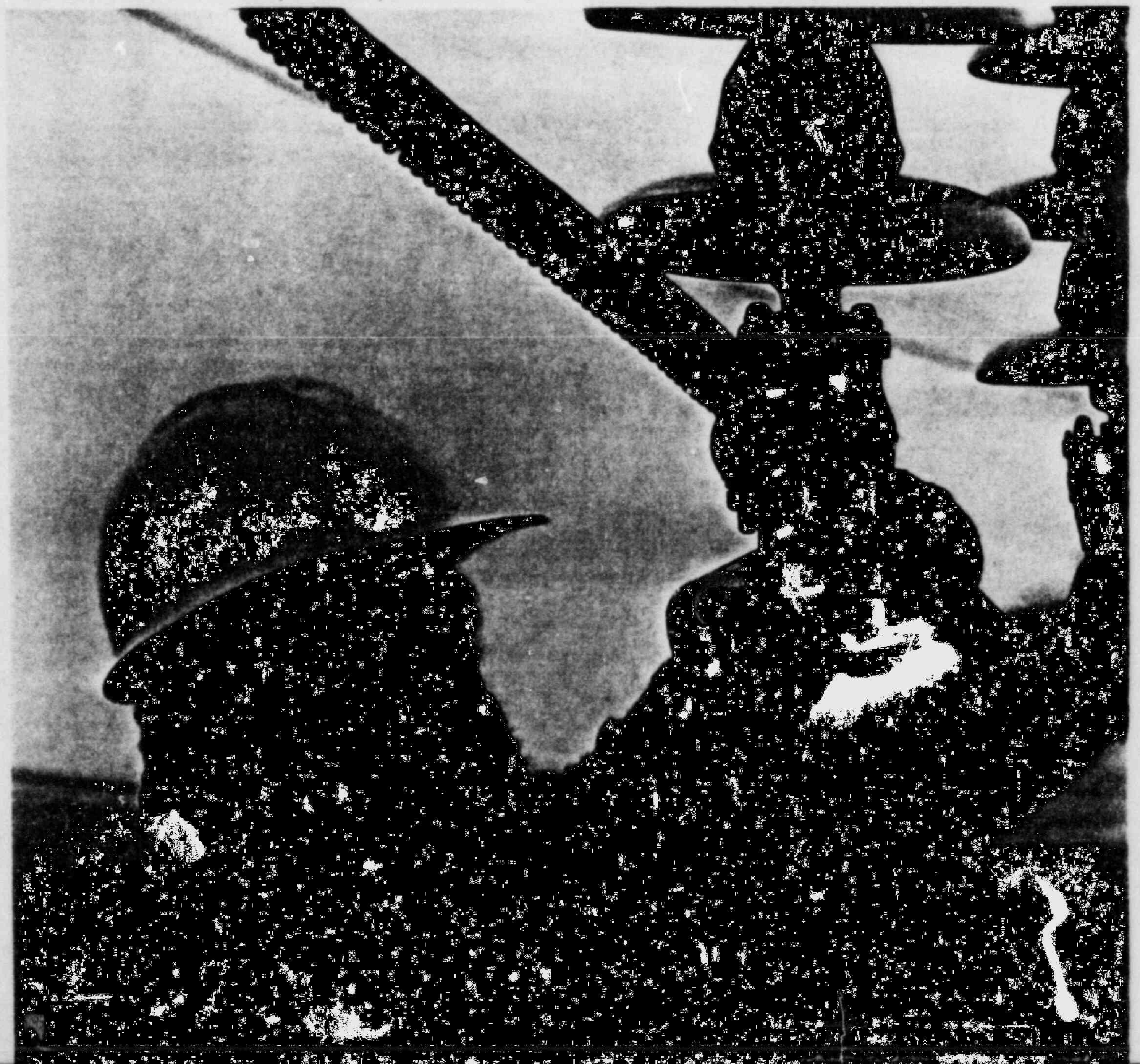
The department is also considering several other programs to lower peak electrical demands, including special rates for industrial customers who cut back usage during peak periods.

In 1981 the Conservation Activities Department will expand and modify its in-home energy audits to conform to the Federal government's Residential Conservation Services (RCS) requirements. The department is now increasing its staff for these RCS audits and will begin offering them in the summer.

The company upgraded the requirements for Energy Checked homes, which are designed to meet energy efficient standards that result in lower peak demands. Forty-three percent of the new homes built in the service area in 1980 signed into the Energy Checked program.

More than 17,000 customers were given advice on saving energy in the home through meetings, individual consultations and telephone conversations. In the

Transmission line construction activity will be heavy in the 80's. Journeyman Lineman Randy Bosley is working on a 138,000-volt line near Katy, Texas.



commercial area, more than 450 walk-through energy audits were made of area businesses.

The Industrial Activities Division continued to help industrial customers form Energy Management Teams to locate energy waste.

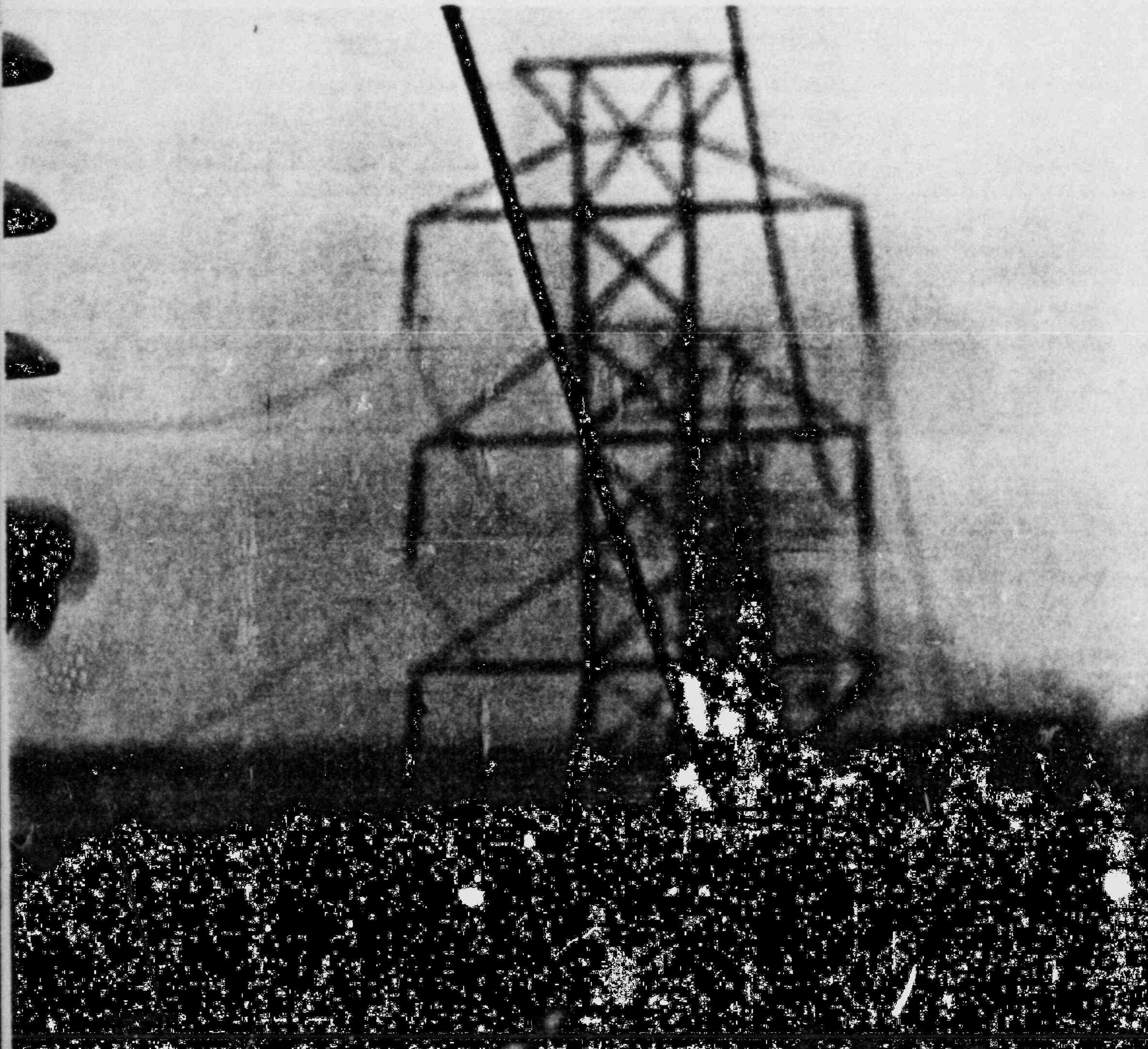
Environmental Expenditures Growing

Expenditures for environmental protection facilities will increase dramatically in the 1980's as HL&P burns more coal. Up to 35 percent of total project cost for new coal and lignite units goes to environmental protection.

In 1980 HL&P spent $27 million for environmental protection. However, it expects to spend more than $212 million in the next three years.

In another environment area, a federal judge vacated in November a 1973 court order that had required HL&P to do extensive monitoring of the biology and water quality around the company's Cedar Bayou plant.

The Environmental Protection Agency was concerned that the plant's cooling water discharge might harm the quality and aquatic life of the water in a nearby bay. The



company had been ordered to expand a monitoring program of the plant's cooling pond and the bay. The plant draws water from Cedar Bayou, passes it through its condensers and discharges the warmed water into a cooling pond that eventually empties into Trinity Bay.

The monitoring demonstrated that no harm has been done to Trinity Bay. In fact, Cedar Bayou has benefited. The ruling will save the company more than $400,000 in monitoring costs planned for 1981 alone.

We're Active in R & D

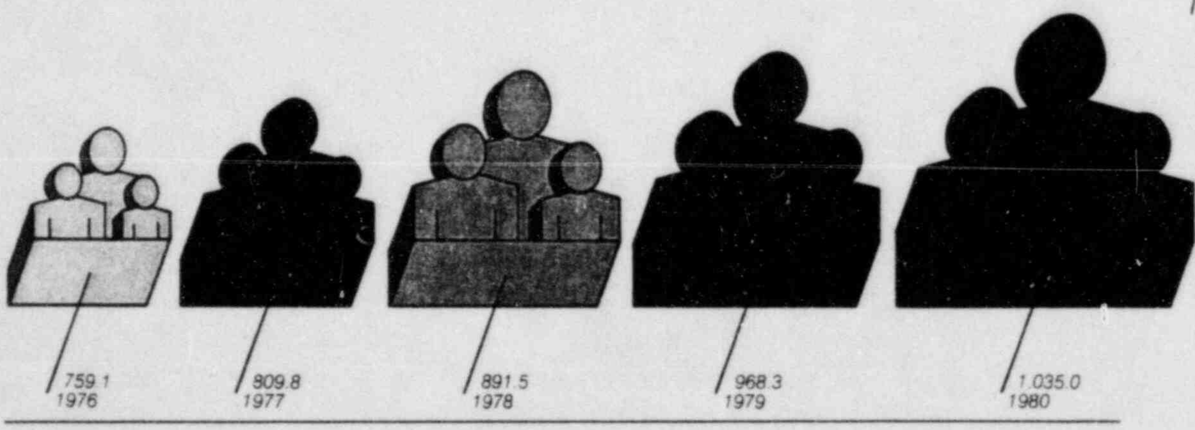
In 1980 the company created a new position of administrator of power system projects. The administrator is now working full time to examine the economics of future generation and alternative fuels projects for existing gas-fired units.

In February 1981 it was announced that Houston Industries and ARCO Petroleum Products Co. will study the feasibility of building a cogeneration plant on the Houston Ship Channel. The electricity produced would add to the supply available to utility customers through an existing network. Steam would be available to the ARCO Houston Refinery and nearby industrial customers.

HL&P continues to help fund fusion research at the University of Texas through the Texas Atomic Energy Research Foundation, which sponsors the UT fusion research center. A new machine designed to contain the fusion reaction was completed in 1980. The Texas Experimental Tokamak (TEXT) will be dedicated in 1981.

The Commercial Research Department is monitoring the energy consumption of several test homes incorporating many energy-saving components. The department is comparing their performance to homes similar in size and design which do not have

Number of Customers (Thousands)



additional energy-saving features. Data from "Project Conservation" through June of 1980 has shown the test homes consume an average of 31 percent fewer kilowatt hours than the conventionally built homes. Monitoring will continue in 1981.

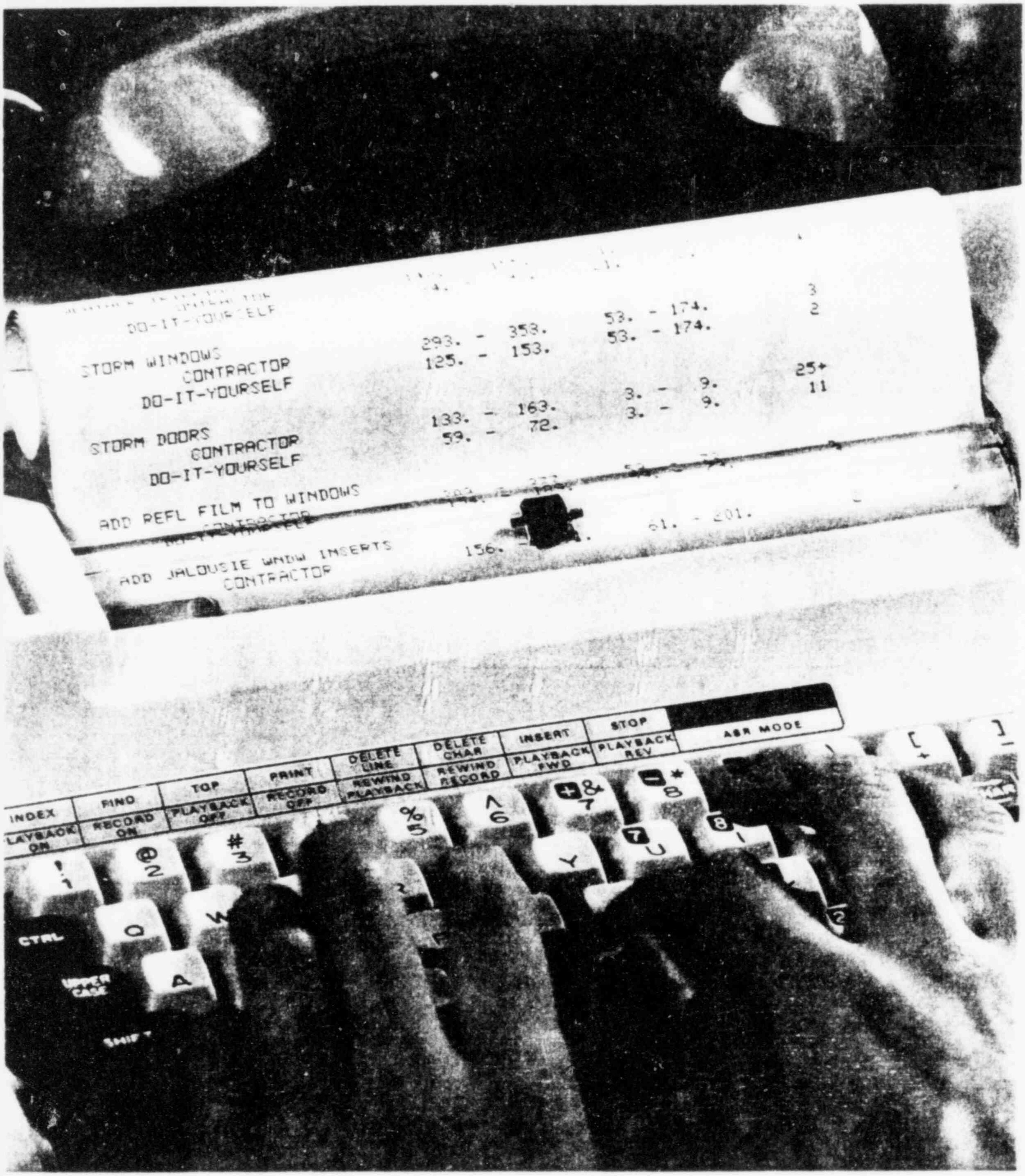
Commercial Research is also testing the effectiveness of programmable set up/set back thermostats and will start a study in 1981 on solar assisted heat pump systems for residential use.

In addition, the company continued financial support of the Electric Power Research Institute (EPRI) which coordinates major research efforts of both public and investor-owned utilities.

Interconnection Agreement Made

In June the company and Texas Utilities Company co-signed an agreement with Central and South West Corporation (CSW) ending a four-year dispute with CSW over whether interconnected electric utilities of the Electric Reliability Council of Texas (ERCOT) should be connected with others.

HL&P is a member of the ERCOT system which operates within the State of Texas.



Portable computer terminals will be used in HL&P's RCS home energy audits so homeowners can be provided an on the spot printout of the costs and payback of taking various energy conservation steps.

If the agreement is approved, two direct current transmission lines would interconnect ERCOT with the Southwest Power Pool (SPP). The pool includes utilities in Oklahoma, Kansas, Missouri, Arkansas, Mississippi, Louisiana and Texas.

The proposed interconnection is not expected to materially affect HL&P's construction costs or the reliability of its service. The Justice Department, which has been granted intervenor status in the Federal Energy Regulatory Commission proceeding, is generally opposed to the proposed settlement. Several months of review by a number of State and Federal regulatory agencies are expected before the agreement becomes final.

We're Communicating to Our Publics

The Public Affairs Department strengthened its nuclear information efforts in 1980 by adding a communicator with a doctorate in physics. To help its own people better understand nuclear power, the company conducted an open house of the South Texas Project. More than 10,000 employees and their families toured the plant October 4.

The South Texas Project Visitor Center operated throughout the year and nearly 16,000 toured the center. It houses displays, working models and an auditorium for viewing films about nuclear power. Van tours of the construction site starting from the center are also available to visitors.

Also in 1980 HL&P ran four advertisements of its "Electricity in the Eighties" series in area newspapers and magazines. The ads discuss the challenges HL&P faces in the areas of power plant construction, fuel supplies and environmental protection.

Advertising continued to urge people to conserve. Customers were asked how they were conserving. Those with the best ideas were featured in television, radio and print advertisements. Ads advocating the purchase of heat pumps, high efficiency air conditioners and Energy Checked homes were also run in 1980.

Volunteer employee members of the Speakers Bureau spoke to more than 20,000 people in 1980 on energy conservation, nuclear power, coal and future energy sources.

About 1,500 civic and opinion leaders and regulators were given tours of STP and the W.A. Parish plant. The tours enable these people to see first hand the magnitude of HL&P's investment in new plant construction.

In the schools, Educational Relations reached more than 8,000 elementary and secondary students with presentations on the basics of electricity and energy.

Greater Efficiency Is an Important Goal

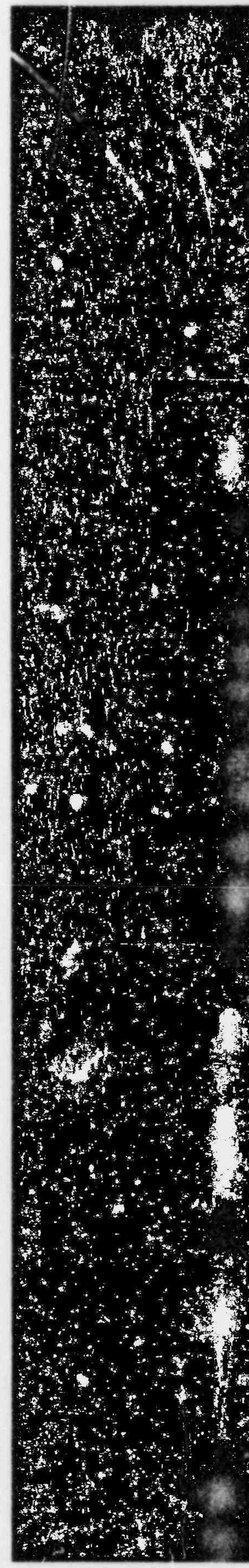
In June the company completed an analysis of its operations that it began on its own initiative in 1975 to improve its efficiency. The study was made under the direction of a management consulting firm with the cooperation and assistance of special company audit teams and the company's Operational Research Division.

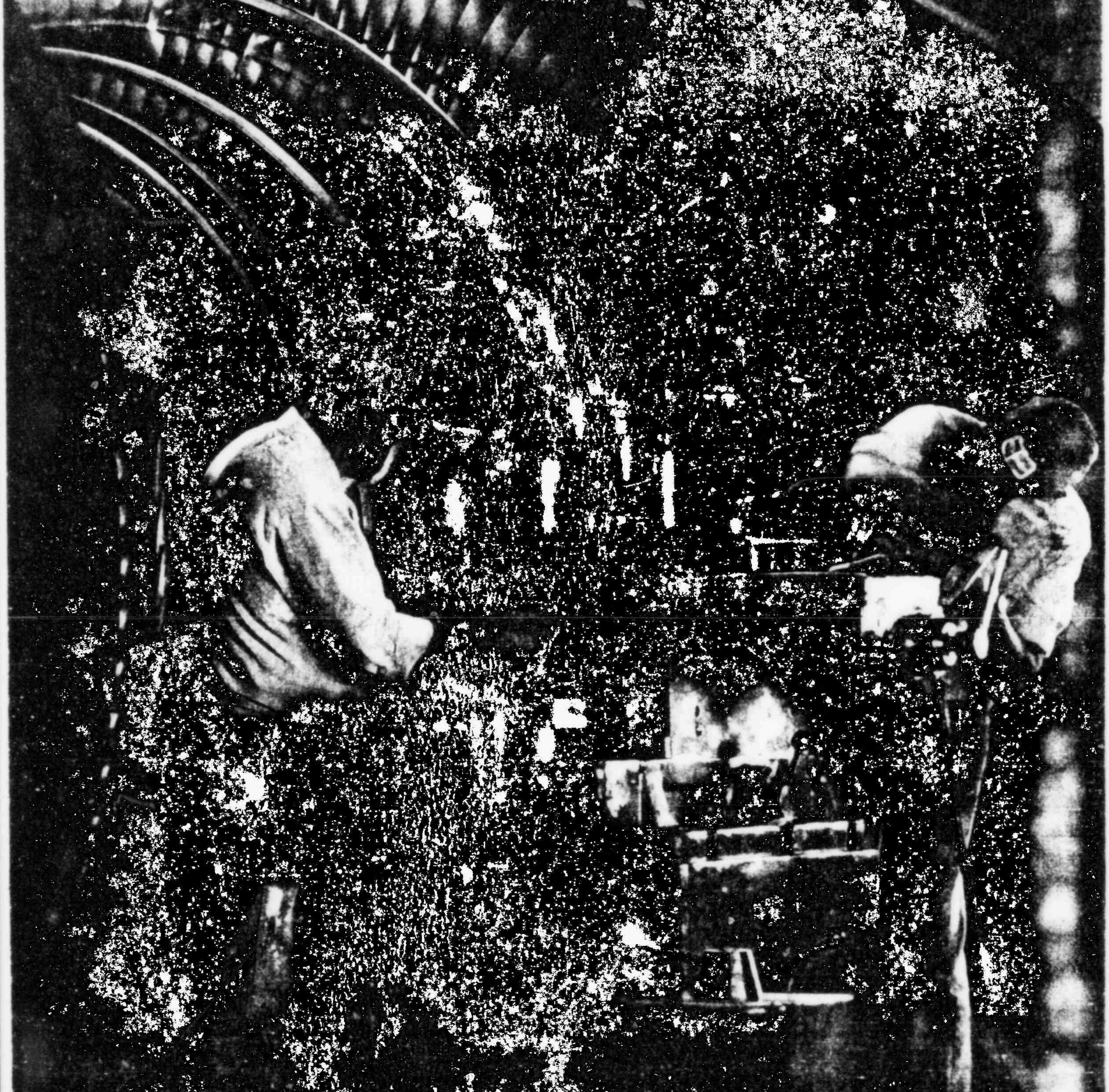
As a result of the recommendations made by the study, HL&P has made a number of organizational changes, begun new programs and procedures and modified or eliminated others. These changes have saved HL&P about $10 million, not including intangible benefits from improved organizational efficiencies and communications.

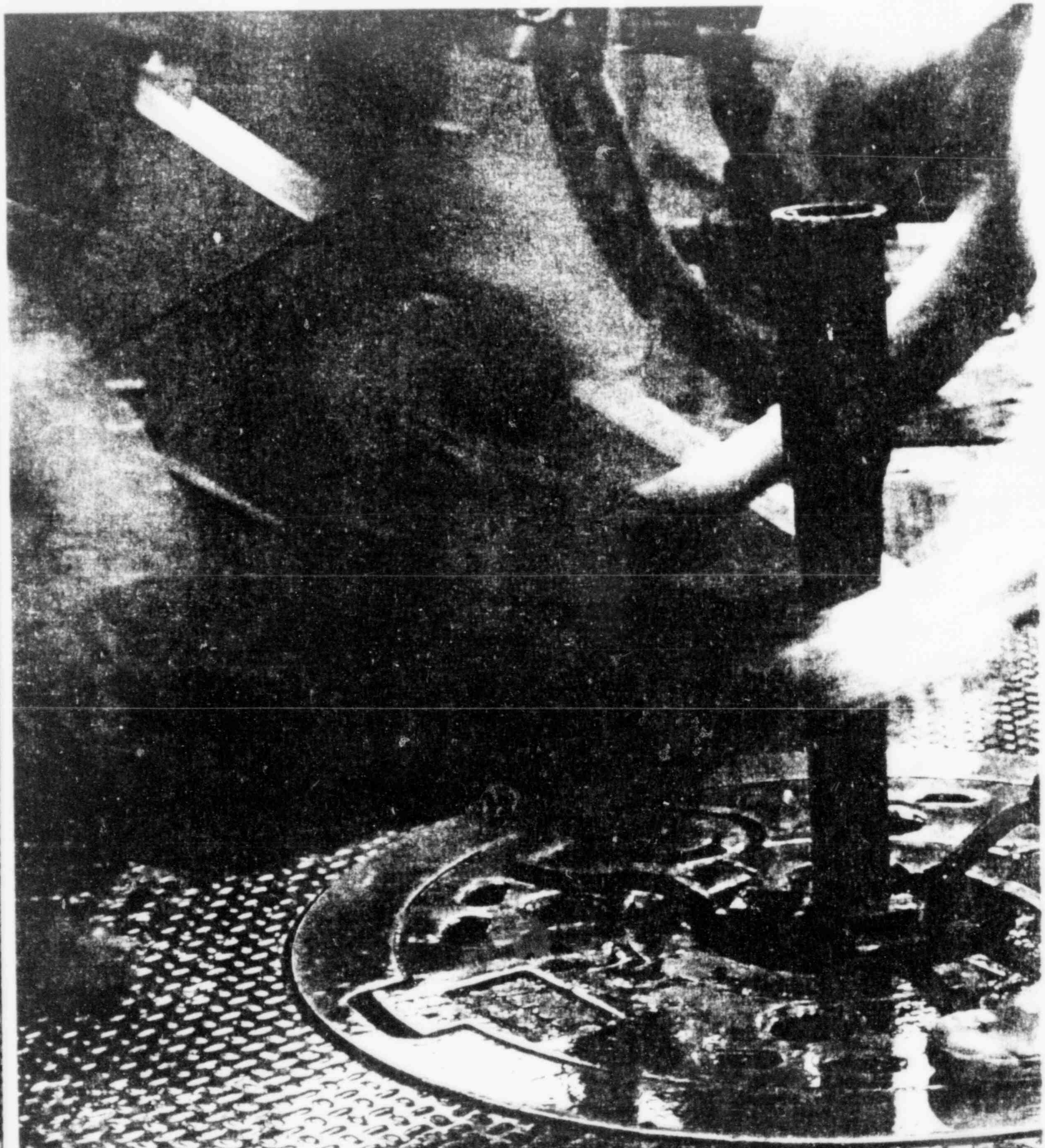
To get maximum production from its older gas-fired units, the company has created a "Unit Availability/Reliability Task Force." At year's end more than 150 megawatts had been recovered through modifications of these existing units. The task force will try to recover more megawatts in the next several years.

To save on fuel costs, the company began participating in a power brokerage system with other Texas utilities in September 1980. The computerized system allows HL&P to buy or sell excess power at prices economically beneficial to the company. Savings in fuel costs to the company in the last four months of 1980 amounted to $160,000.

To more efficiently handle the increasing number of customers' calls, the company installed a new call distribution system in the Customer Service Department.







Primary Fuels, Inc.

Primary Fuels' production and earnings were down from 1979.

PFI's revenues were $40.4 million compared to $40.9 million in 1979. Net income was $3.7 million compared to $11.5 million in 1979. This was a contribution of 10 cents to HI's earnings per share compared to 34 cents per share the previous year.

Production totalled 14 billion cubic feet of gas and 204,000 barrels of oil and condensate, compared to 17 billion cubic feet and 227,000 barrels in 1979. Average daily production was down to 37 million cubic feet of gas from 47 million in 1979.

Net income was down for several reasons. Depreciation, depletion and amortization increased $9.5 million. This was the result of a substantial investment in wells and equipment in its partnership with Shell Oil Company.

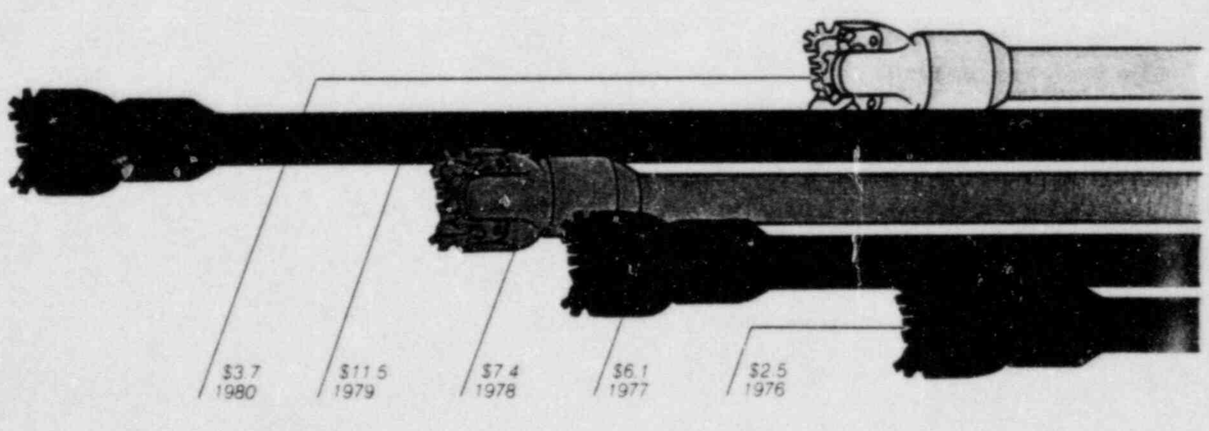
PFI invested $41 million in the Shell partnership in 1980 while revenue from production was less than $800,000. This disparity is due to the fact that significant marketing of oil and gas did not occur in1980. More wells and pipeline facilities must be completed to start marketing of the 11 new fields discovered during 1980.

Higher costs of borrowing plus more debt increased interest expense by $1.7 million, while older properties and inflation increased operating expenses by $2.1 million.

PFI's per share contribution to HI's earnings was also down because of the 17 percent increase in the average number of shares outstanding.

Gas was sold during December at an average price of $2.87 per thousand cubic

Primary Fuels Net Income (Millions)



feet, after all transportation charges and other adjustments. Oil and condensate were selling at $26.38 per barrel. This compares with $2.29 and $14.07 respectively for gas and oil in December 1979. Gas and condensate from El Gordo, the most productive of PFI's nine offshore fields, accounted for about 73 percent of its 1980 production.

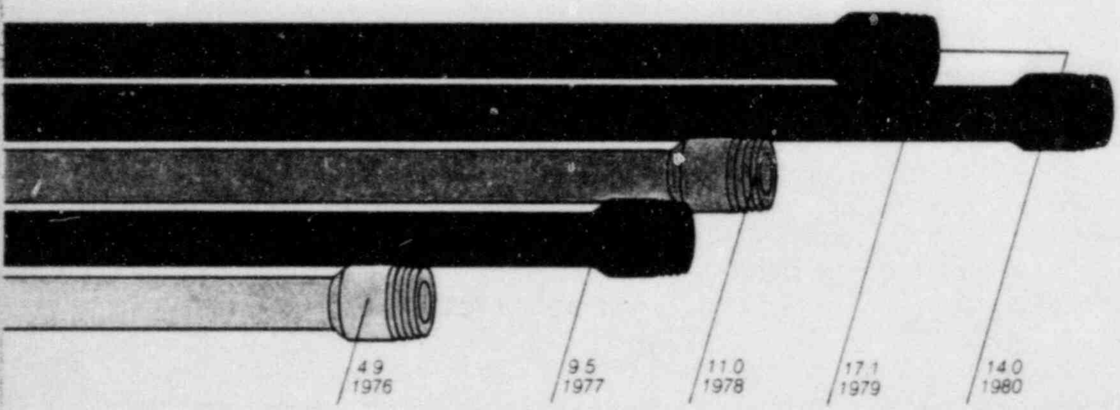
Higher prices bolstered PFI's income from lower production. Primary Fuels renegotiated its contract effective April 1 with Houston Pipeline Company, which buys all of El Gordo's natural gas. The amended contract enables PFI to obtain the maximum price allowed by Federal law for its gas.

Offshore Activity

Primary Fuels has a 50 percent interest in a joint oil and gas exploration and production venture being conducted offshore along the Texas Gulf Coast. At the end of the year, 33 of the 64 wells drilled since the venture began were commercial producers and 30 were dry holes. One well was being drilled.

At year's end, PFI had a 50 percent interest in approximately 71,000 acres of offshore leases acquired from the State of Texas and 5,800 offshore acres under lease from the Federal government. PFI acquired 11,600 acres of offshore leases in 1980. Approximately 12,150 acres will expire in 1981. Of the 1980 acreage about 25 percent was held by production.

Primary Fuels Gas Production (Billions of Cubic Feet)



Primary Fuels has drilled three wells on the Federal tract. Additional wells and platforms are planned for 1981. Production from Clear Field began in March 1981. PFI has an active program for exploring and developing the remaining State acreage.

The following table is based on reports made to Primary Fuels by Miller and Lents, Ltd., independent oil and gas consultants.

	Natural Gas (MMCF)	Oil, Condensate and Natural Gas Liquids (Barrels)
Proved Developed and Undeveloped Reserves:		
As of January 1, 1979	88,666	1,035,094
Revisions of Previous Estimates	4,621	101,048
Extensions, Discoveries and Other Additions	4,613	771,353
Production	(17,064)	(227,071)
As of January 1, 1980	80,836	1,680,424
Proved Developed and Undeveloped Reserves:		
As of January 1, 1980	80,836	1,680,424
Revisions of Previous Estimates	(3,302)	98,549
Extensions, Discoveries and Other Additions	5,895	172,832
Production	(13,666)	(204,352)
As of January 1, 1981	69,763	1,747,453
Proved Developed Reserves:		
As of January 1, 1979	88,666	1,035,094
As of January 1, 1980	80,679	1,598,532
As of January 1, 1981	45,378	1,538,001

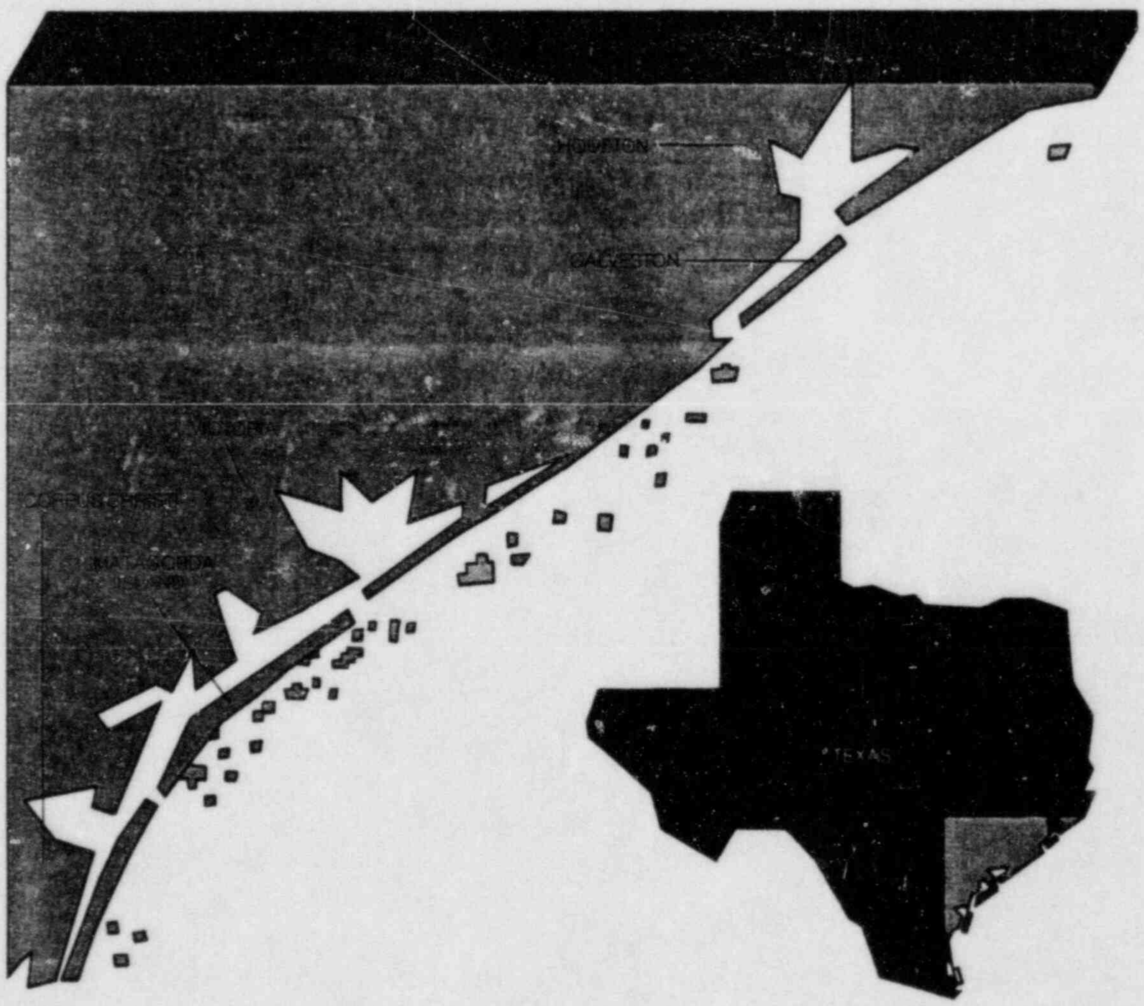
Onshore Activity

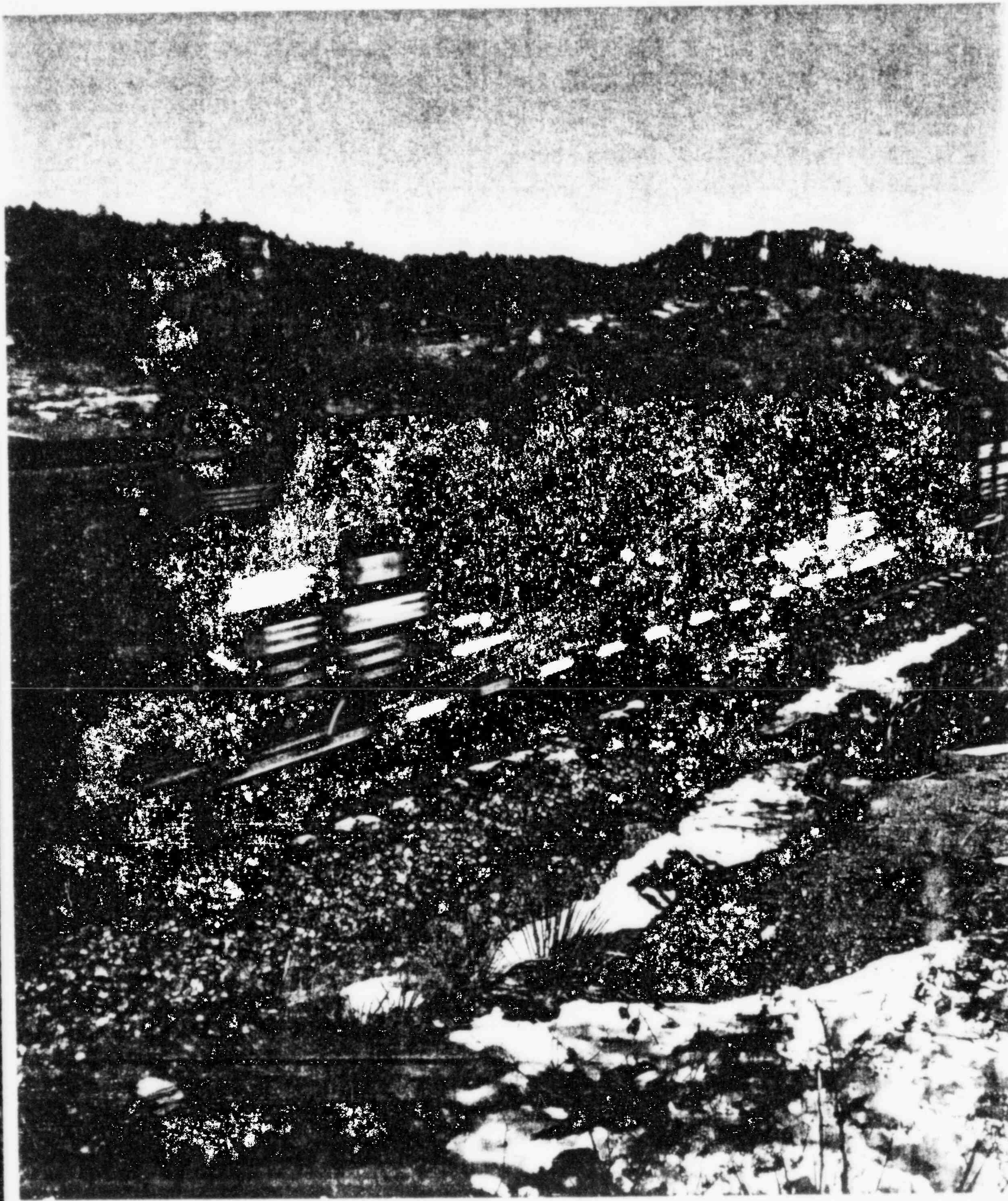
Primary Fuels signed an agreement with Shell in 1978 to be a limited partner in Shell's oil and gas exploration and production in most of the continental U.S. At year's end, PFI had participated in drilling 152 wells with Shell. Forty-five were commercial producers, 13 were being tested, 32 were being drilled and 62 were dry holes.

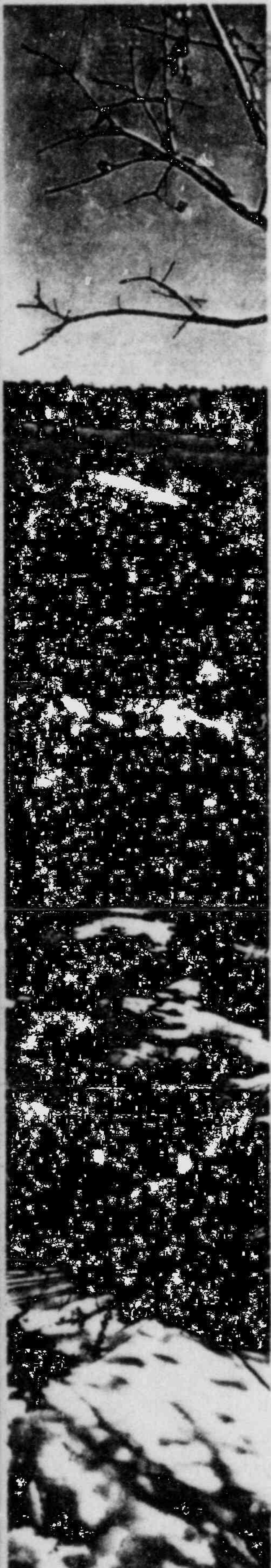
The investment PFI made in the Shell program in 1980 reflects the additional money required to drill very deep and difficult prospects today.

PFI believes that the Shell program provides access to good prospects that will be very important to Primary Fuels in the next few years. Therefore, despite the substantial investment made in 1980, PFI has exercised its option to remain in the program in 1981.

Primary Fuels Offshore Acreage







Utility Fuels, Inc.

UFI's net income was $3.5 million, down from 1979's $4.8 million. This was a contribution of 9 cents to HI's earnings per share compared to 15 cents per share in 1979. To date UFI has operated primarily as a supplier and transporter of coal to HL&P under an agreement signed in 1978.

UFI's undertaking this function saves money for HL&P and its customers. This is because it can take advantage of financing arrangements not available to HL&P because of its financial requirements as a utility. In addition, UFI's making the substantial investments needed to supply fuels reduces HL&P's capital requirements, which has a positive effect on HL&P's financial viability.

UFI began delivering coal to HL&P from Montana in July. Utility Fuels has a 25-year contract with Spring Creek Coal Company for 181.1 million tons of coal. In April, it extended its contract with Kerr-McGee Coal Corporation for 40 million tons of coal through 2003. The contract would have expired in 1980.

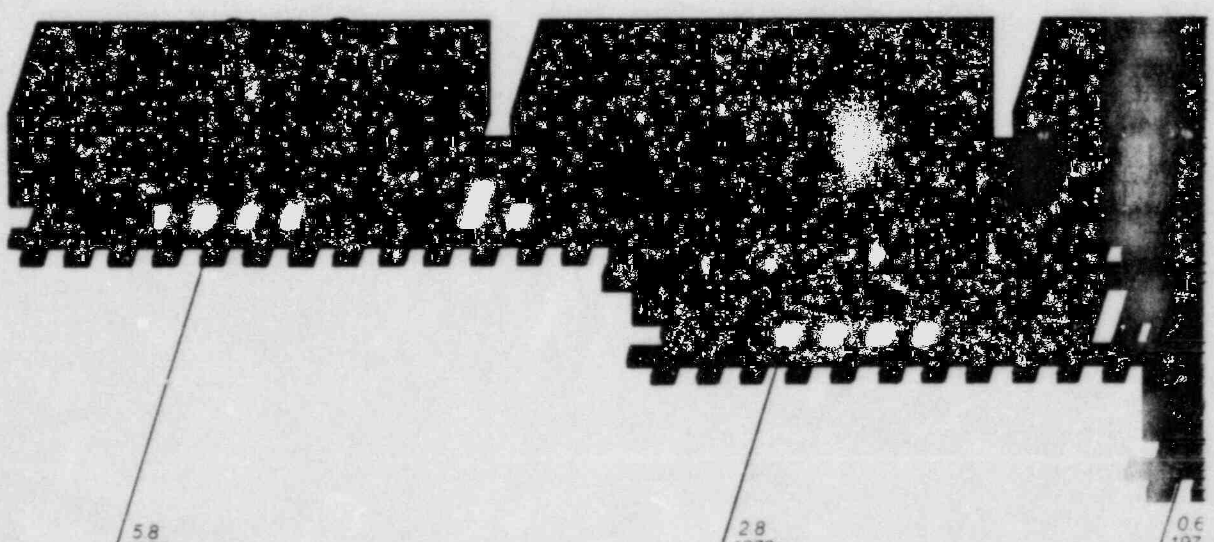
Together these two contracts assure a supply of western low-sulfur coal for HL&P's coal-fired units through the turn of the century. UFI delivered 5.8 million tons of coal to HL&P in 1980. When HL&P's fourth coal-fired unit is completed in 1983, Utility Fuels expects to be shipping about 8 million tons of coal a year to the W.A. Parish plant.

Utility Fuels is now building additional coal handling facilities at the plant to accommodate the fourth coal unit under construction there. The coal handling facilities will cost about $42 million.

In October UFI completed leveraged lease agreements to acquire 720 railcars and plans to acquire another 440 in 1981 through additional lease agreements. These acquisitions will increase the number of railcars in UFI's fleet to 2,520 which is almost 23 unit trains.

While western low-sulfur coal represents all of UFI's fuel supply activities at this time, Utility Fuels will actually be delivering more lignite than western coal when HL&P's four planned lignite units are on line.

UFI Coal Deliveries (Millions of Tons)

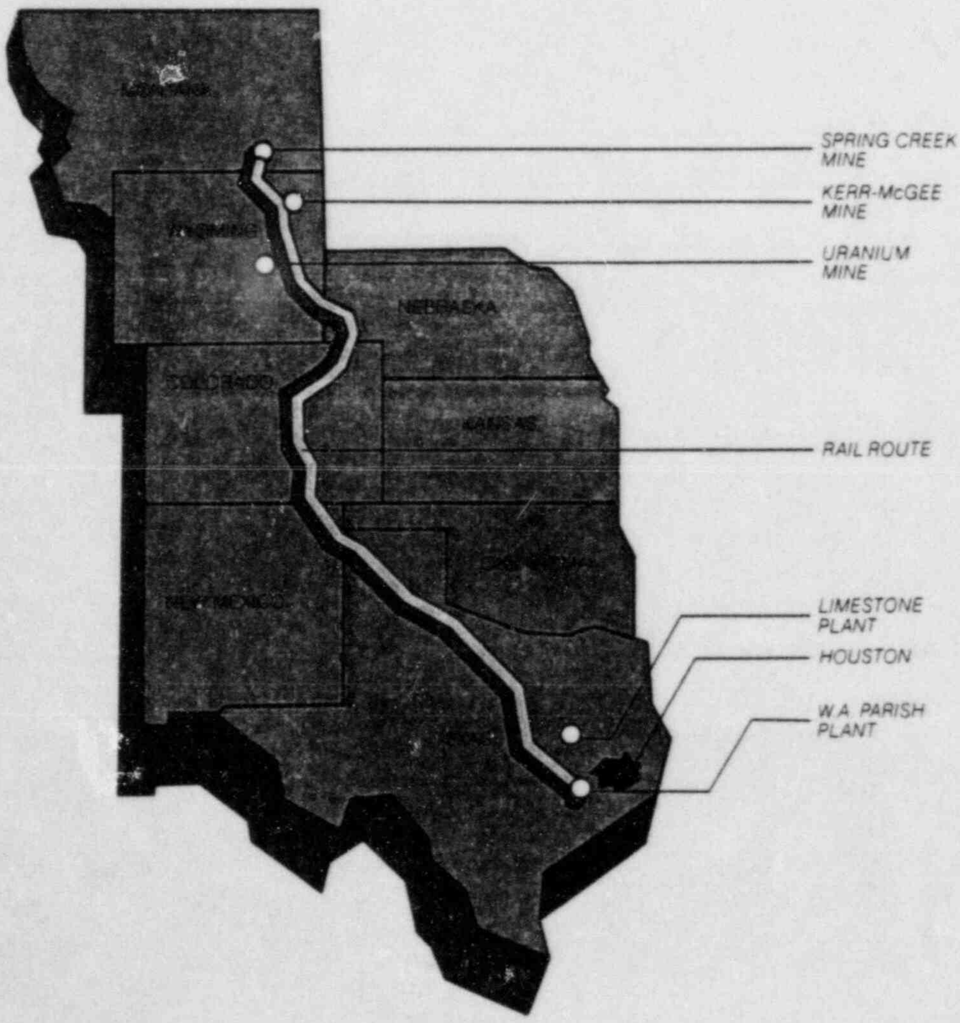


UFI has a contract with Northwestern Resources Company (NWR) for a supply of lignite to fuel HL&P's Limestone Electric Generating Station. Work will begin in 1981 on Limestone's two units, which will need about 240 million tons of lignite over their life. NWR will do the mining and reclamation work for UFI. Utility Fuels will spend about $11 million during 1981-1983 for mining, transportation and fuel handling facilities to serve Limestone.

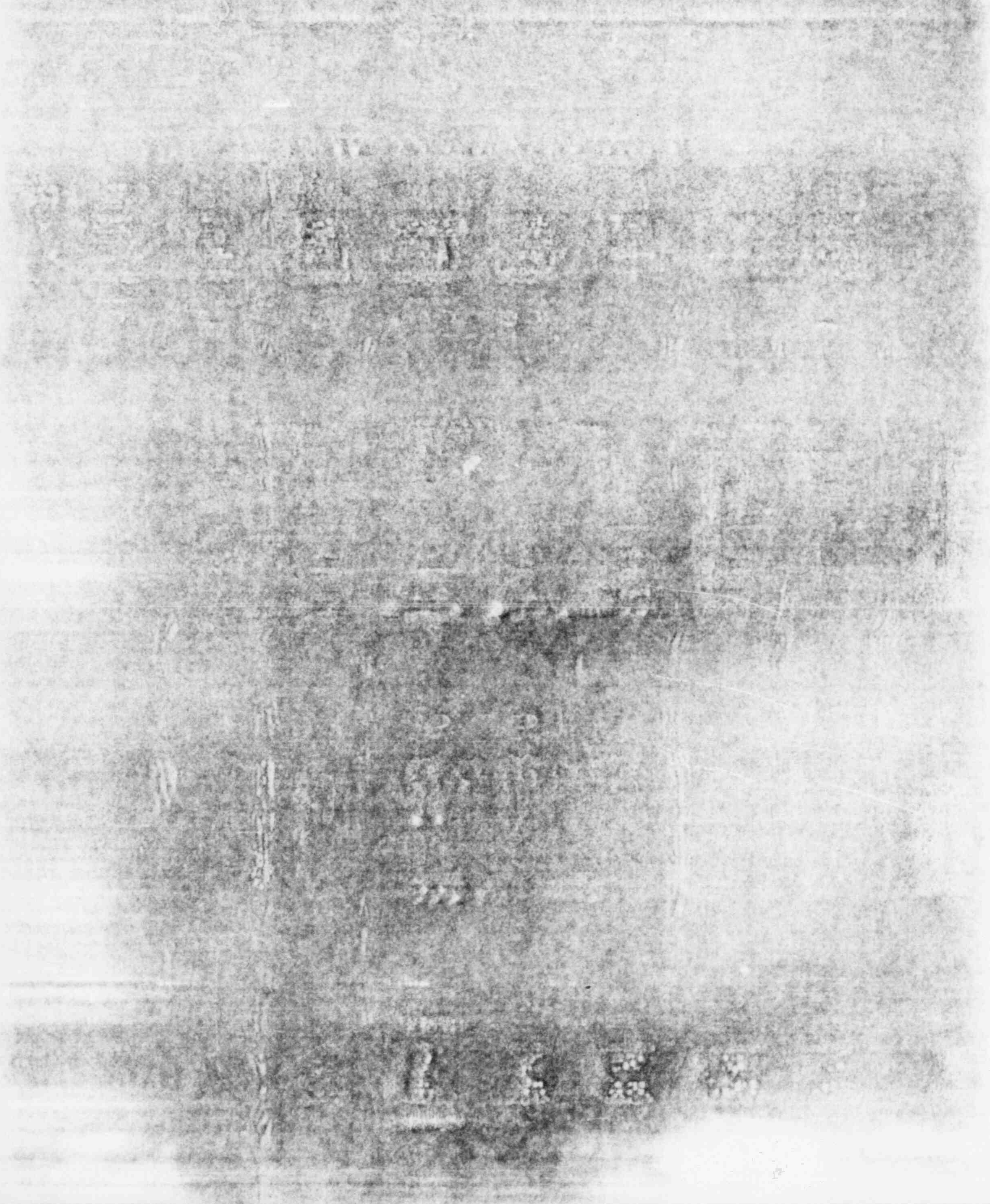
Uranium

UFI has a small uranium mining operation on an 80-acre lease in the Shirley Basin near Casper, Wyoming.

Nearly 807,000 pounds of yellowcake have been made available to UFI from uranium ore milled near the mine through the end of 1980. The amount of yellowcake the company expects to get from the project could provide the equivalent of three years of fuel reloads for a 1,200-megawatt nuclear plant.



Financial Section



Operating Statistics of HL&P

	Year Ended December 31, 1980	1979	1978
Operating Revenue (Thousands of Dollars):			
Residential	$ 628,599	$ 453,354	$ 367,730
Commercial	436,360	350,000	274,081
Industrial	951,546	790,715	593,251
Street Lighting - Government and Municipal	9,257	6,634	3,608
Other Electric Utilities	98,353	78,898	57,359
Total	2,124,115	1,679,601	1,296,029
Miscellaneous Electric Revenues	(158)	27,971	7,575
Total	$ 2,123,957	$ 1,707,572	$ 1,303,604
Electric Plant Investment (Thousands of Dollars):			
Gross Additions	678,646	532,619	491,107
Total Plant Investment	4,560,660	3,900,935	3,386,463
Accumulated Depreciation	678,717	591,465	512,604
% of Total Plant Investment	14.9	15.2	15.1
Generating Statistics:			
Steam Electric Stations Economy — Btu Per Net KWH Generated	10,284	10,285	10,223
Turbine Name Plate Capacity (MW)	11,607	11,056	11,056
Maximum System Load (MW)*	10,266	9,336	9,114
Electric Plant in Service Per KW of Maximum System Load ($)	323	305	296
General Statistics:			
Kilowatt Hour Sales (000)	54,803,619	52,360,503	50,275,767
Number of Customers	1,036,023	968,291	891,509
Average Residential Use (KWH)	14,219	13,522	14,734
Average Residential Revenue Per KWH	5.00¢	4.09¢	3.36¢
Average Cost of Fuel (Million BTU)	205.9¢	171.0¢	126.2¢

*Excluding interruptible demand

Five-Year Comparison of Selected Financial Data

The following table sets forth selected financial data with respect to the Company's consolidated financial condition and results of operations and should be read in conjunction with the Consolidated Financial Statements and the related notes included elsewhere herein.

(thousands of dollars, except per share amounts)
Year Ended December 31,

	1980	1979	1978	1977	1976
Revenues	$2,367,264	$1,854,159	$1,349,438	$1,095,561	$ 861,174
Net Income	$ 183,981	$ 161,846	$ 128,657	$ 125,636	$ 105,314
Earnings per share	$4.71	$4.84	$4.21	$4.41	$4.01
Cash dividends declared per common share	$2.68	$2.36	$2.12	$1.86	$1.61
Return on average common equity	13.6%	14.4%	13.3%	14.9%	15.0%
At year-end:					
Book value per common share	$35.14	$34.62	$33.04	$31.14	$28.27
Market price per common share	$ 28½	$ 29⅛	$ 27⅜	$ 30⅝	$ 31¾
Market price per common share as % of book value	81%	84%	83%	98%	112%
At year-end:					
Total Assets	$4,432,938	$3,834,697	$3,314,671	$2,719,865	$2,289,982
Long-term debt of subsidiaries	$1,604,337	$1,497,390	$1,377,646	$1,074,980	$ 950,310
Capitalization:					
Common stock equity	44%	41%	39%	40%	40%
Cumulative preferred stock	7	8	8	10	9
Long-term debt	49	51	53	50	51
Total Capitalization	100%	100%	100%	100%	100%
Capital expenditures:					
Construction expenditures (excl. AFUDC)	$664,843	$523,477	$498,482	$441,566	$309,775
Oil, gas and mining expenditures	$ 66,975	$ 39,879	$ 32,102	$ 24,690	$ 15,869
HL&P selected data:					
Percent of construction expenditures financed internally from operations	37%	39%	39%	40%	49%
Ratio of earnings to fixed charges	3.54	3.62	3.61	4.08	3.97
AFUDC as a percent of net income	24%	29%	24%	20%	16%

Management's Discussion and Analysis of Financial Condition and Results of Operation.

General

The Company's operating results have been mixed over the last three years because of the negative pressures of increasing construction expenditures during the periods of high inflation and erratic electric sales due to uncertain economic conditions, weather and energy conservation. Rate increases, which have been approved and implemented approximately once each year, have allowed HL&P to keep pace with its service area's immediate needs for power, but its overall financial condition has deteriorated since the mid 1970's.

The portion of HL&P's construction program that was financed from internally generated funds from operations and interest coverage declined during 1980, reflecting the 25% increase in construction spending and the substantial increase in interest rates. HL&P's return on average common equity has improved somewhat during the past two years principally as a result of $89 million of rate relief realized in 1979 and $106 million in 1980. Nevertheless, as discussed under "Supplementary Information to Disclose the Effects of Changing Prices", electric rates have not kept pace with inflation. As a result, HL&P has been unable to earn the returns on common equity granted by the Utility Commission in its rate orders. HL&P's authorized returns on common equity for 1979 and 1980 were 13.8% and 15%, but the actual returns were 13.1% and 13.4%, respectively.

Another indication of the Company's general financial condition is the portion of net income attributable to the allowance for funds used during construction (AFUDC). Although AFUDC, a non-cash item, rose steadily in 1978 and 1979 because of increases in construction activity and increased AFUDC accrual rates due to higher costs of capital, the amount of AFUDC in relation to net income declined in 1980 due to the allowance of larger portions of construction work in progress in rate base by regulatory authorities and the placing in service of the W. A. Parish No. 7 coal-fired unit.

Net income for 1980 was 14% higher than for 1979, but due to a 17% increase in the Company's average common shares outstanding, earnings per share decreased by 13 cents. HL&P's contribution to the Company's per share earnings reflects an increase of 18 cents while Primary Fuels' and Utility Fuels' contributions were down 24 cents and 6 cents per share, respectively. To help finance new construction, 6.7 million shares of additional common stock were sold in 1980 with net proceeds of $175 million and $100 million of First Mortgage Bonds, resulting in part in the improvement at December 31, 1980 in the Company's capitalization ratios.

Results of Operation

Earnings for HL&P increased in each of the last three years as a result of sales growth and rate increases, but were adversely affected by rapid escalation in operation and maintenance costs and rising interest rates. Although fuel expense has nearly doubled since 1978, earnings were generally unaffected due to adjustment clauses in the electric service rate schedules.

The contributions of Primary Fuels to the Company's earnings were 24¢ and 34¢ per share in 1978 and 1979, respectively, primarily as the result of increased sales of oil and gas. However, Primary Fuels' earnings in 1980 were adversely affected by substantial expenditures in its oil and gas exploration program without the establishment of significant proved reserves. In December 1980, based on a January 1, 1981 reserve study of Primary Fuels' independent oil and gas consultants, an adjustment for depreciation, depletion and amortization of approximately $8,000,000 was charged against income. In addition, gas sales did not keep pace with increased operating expenses. This factor coupled with the increase in the Company's average shares outstanding, caused Primary Fuels' contribution to the Company's earnings in 1980 to dip to 10¢ per share. Utility Fuels' contract with HL&P is a cost-plus contract allowing Utility Fuels to recover its cost plus a fixed return on its net investment. The reduction in Utility Fuels' contribution is principally due to the increase in the Company's average shares outstanding and less miscellaneous income than in 1979.

Revenues. As shown below, the majority of the increase in electric operating revenues has been due to the recovery of increased fuel costs through fuel adjustment clauses.

	% of Revenue Increase Attributable to		
Comparative Periods	Recovery of Increased Fuel Costs	Rate Increases	Increased KWH Sales
1978 v. 1977	73%	5%	22%
1979 v. 1978	63%	22%	15%
1980 v. 1979	63%	25%	12%

Increasing construction expenditures to meet load growth and comply with federal requirements for the conversion to alternate fuel sources, coupled with inflationary pressures, has required HL&P to seek rate increases more frequently. As a result, new rates have been placed in effect in each of the past three years. KWH sales increases have averaged 6% over the last three years, contributing to the growth in revenue. This growth rate is lower than experienced historically due to some conservation by customers and, in 1980, economic conditions affecting the larger industrial customers. Because of the widespread use of air conditioning, weather also significantly affects KWH sales in the HL&P service area, primarily in the residential class. An unseasonably mild summer negatively influenced 1979 electric usage. However, an extended heat wave in 1980 caused residential KWH usage to attain record levels and average usage per residential customer increased from 13,522 KWH in 1979 to 14,219 KWH in 1980.

Gas sales by Primary Fuels decreased by 20% during 1980 as a result of decreased demand and a normal decline in productive capacity as compared with an increase of 54% in 1979 over sales levels of 1978. Decreased sales in 1980, however, were almost completely offset by increased prices.

Fuel Expense. These costs have nearly doubled since 1978. The increase in the price of fuel and, to a lesser extent, increased KWH generation are the contributing factors. The rapid increase in fuel costs has contributed to the increase in HL&P's average residential revenue per KWH from 3.4¢ in 1978 to 5.0¢ in 1980. The increases in cost of coal sold for each year are due to larger coal requirements by HL&P for its

W. A. Parish plant. HL&P brought new coal-fired units into service in each of the years 1978 through 1980.

Purchased Power Expense. The increase in these costs reflects purchases of economy energy from other utilities in Texas.

Operating and Maintenance Expenses. Operation and maintenance costs have increased 58% over the last three years because of general inflationary pressures, the use of larger, more complicated generating and pollution control equipment and substantial increases in labor costs. Increased reliance on coal-fired power plants has added significantly to the cost of operation and maintenance. The employee work force has increased by about 21% over the last three years as a result of increasingly complex construction and business activities, additional government regulations and the growth in the number of customers being served.

Non-Operating Items. AFUDC is an amount representing the cost of funds used to finance construction projects and is capitalized as part of the cost of the asset. AFUDC is a non-cash item of net income and represents a cost recoverable from customers through provisions for depreciation in future periods. Increases in amounts for AFUDC not only correspond to increases in construction expenditures, but also to increases in the AFUDC accrual rate and the level of investment in construction that is not earning a cash return. Since January 1979, AFUDC has been computed on a net of tax rate closely following the rising cost of capital. The AFUDC accrual rates for 1978 through 1980 were 6.5%, 7.5% and 8.5%, respectively. Effective January 1, 1981 HL&P began accruing AFUDC at a rate of 9.25%.

In the Utility Commission's final order relating to HL&P's 1979 rate case, the recovery of its investment in a uranium exploration project was disallowed. As a result, $8,964,000 was charged against other income in December 1979.

Liquidity and Capital Resources

The capital requirements for 1980 and as estimated for 1981 through 1983 are as follows:

	millions of dollars			
	1980	1981	1982	1983
Construction and nuclear fuel (excluding AFUDC)	$637	$709	$783	$964
Railroad cars, coal handling facilities and lignite mining and handling facilities	31	53	29	9
Oil and gas exploration and development	53	71	—	—
Maturities of long-term debt	8	28	8	17
Total	$729	$861	$820	$990

Construction and nuclear fuel expenditures represent estimated costs of HL&P's construction program. The estimated expenditures for railroad cars, coal handling facilities and lignite mining and handling facilities are planned expenditures by Utility Fuels in connection with HL&P's major generating station projects. Primary Fuels' expenditures for oil and gas exploration subsequent to 1981 cannot be estimated until the results of its 1981 exploration and development program are known.

HL&P expects to finance a portion of its construction program through funds generated internally from operations. Factors affecting the ability of HL&P to fund a portion of its capital requirements from internal funds include regulatory practices allowing a substantial portion of construction work in progress in rate base, adequate depreciation rates, full recovery of the cost of fuel used in the generation of electricity and the opportunity to earn competitive rates of return. It is presently estimated that during the next three years 30% to 35% of HL&P's construction program can be financed through the use of internally generated funds from operations assuming HL&P can obtain rate relief on a timely basis at a level comparable to that most recently granted by the Public Utility Commission.

The remainder of HL&P's construction program will be financed through proceeds received from the sale of common stock by the Company and the sales of preferred stocks and long-term debt by HL&P. HL&P's capitalization ratios at December 31, 1980 consisted of 48% long-term debt, 7% preferred stock and 45% common stock and retained earnings with similar ratios expected to be maintained in the future. Principally because of HL&P's large capital requirements, Moody's Investors Service, Inc. lowered its rating of HL&P's First Mortgage Bonds and Preferred Stock in 1980 from double A to single A; however, two other rating agencies continue to rate HL&P's securities double A. As a result of such downgrading, HL&P expects relatively higher capital costs in connection with its future sales of long-term debt and preferred stock.

Utility Fuels and Primary Fuels finance their respective capital requirements independent of HL&P. Capital requirements of Utility Fuels are expected to be financed principally through sales of long-term debt and from leveraged leases, both involving guarantees by the Company. Primary Fuels' expenditures for 1981 are expected to be met from internally generated funds, short-term borrowings and, possibly, sales of production payments.

For information regarding bank lines of credit and short-term borrowings see Note 5 to the Consolidated Financial Statements.

Statements of Consolidated Income

(Thousands of Dollars)

	Year Ended December 31,		
	1980	1979	1978
Revenues:			
Electric	$2,123,957	$1,707,572	$1,303,604
Coal sales	202,953	105,686	20,823
Oil and gas	40,354	40,901	25,011
Total	2,367,264	1,854,159	1,349,438
Expenses:			
Electric:			
Fuel	1,206,872	958,112	682,261
Purchased power	29,995	8,440	4,753
Operation and maintenance	301,065	245,368	190,110
Taxes other than income taxes	80,856	72,853	62,251
Cost of coal sold	180,373	82,170	15,489
Oil and gas operating expenses	8,883	6,755	5,449
Depreciation, depletion and amortization	129,483	109,445	81,010
Total	1,937,527	1,483,143	1,041,323
Operating Income	429,737	371,016	308,115
Other Income:			
Allowance for other funds used during construction	32,735	31,928	17,029
Other - net	3,057	(3,792)	2,689
Total	35,792	28,136	19,718
Fixed Charges:			
Interest on long-term debt	129,139	107,447	87,140
Other interest	16,566	11,992	7,566
Allowance for borrowed funds used during construction	(18,302)	(20,205)	(11,639)
Preferred dividends of subsidiary	20,042	19,765	17,330
Total	147,445	118,999	100,397
Income Before Federal Income Taxes	318,084	280,153	227,436
Federal Income Taxes:			
Current	10,466	5,925	(3,074)
Deferred:			
Liberalized depreciation	39,507	32,316	34,511
Investment tax credit — net	43,685	57,758	50,833
Oil and gas	11,286	6,014	7,117
Other - net	29,159	16,294	9,392
Total	134,103	118,307	98,779
Net Income	$ 183,981	$ 161,846	$ 128,657
Earnings Per Common Share	$4.71	$4.84	$4.21
Weighted Average Common Shares Outstanding (000)	39,075	33,437	30,590

See Notes to Consolidated Financial Statements.

Statements of Changes in Consolidated Financial Position

(Thousands of Dollars)

	Year Ended December 31, 1980	1979	1978
Sources of funds:			
Operations:			
Net income	$183,981	$161,846	$128,657
Items not requiring an outlay of working capital:			
Depreciation, depletion and amortization	134,009	110,462	82,303
Deferred federal income taxes - net	79,952	54,624	50,929
Investment tax credit deferred - net	43,685	49,634	44,380
Allowance for funds used during construction	(51,037)	(52,133)	(28,668)
Total	390,590	324,433	277,601
Common stock dividends	(105,148)	(78,637)	(64,458)
Reinvested funds from operations	285,442	245,796	213,143
Financing:			
Sale of common stock	175,272	134,350	65,090
Sale of preferred stock	—	29,573	—
Sale of first mortgage bonds	100,000	125,000	225,000
Sale of secured notes and capital leases	31,552	—	65,000
Pollution control revenue bonds	5,000	2,274	16,926
Change in notes payable and temporary cash investments	88,015	49,052	(44,496)
Reclassification to current maturity of long-term debt	(29,605)	(7,530)	(3,930)
	370,234	332,719	323,590
Other:			
Decrease (increase) in working capital (exclusive of notes payable and temporary cash investments)	73,180	(18,559)	3,563
Other - net	2,962	3,400	(9,702)
	76,142	(15,159)	(6,139)
Total	$731,818	$563,356	$530,594
Application of funds:			
Construction and nuclear fuel expenditures and lignite advance (net of allowance for funds used during construction)	$664,843	$523,477	$498,492
Oil, gas and mining expenditures	66,975	39,879	32,102
Total	$731,818	$563,356	$530,594
Increase (decrease) in working capital (exclusive of notes payable and temporary cash investments)			
Current assets:			
Cash in banks	$ 337	$ 2,084	$ (1,657)
Customer accounts receivable	20,394	5,614	16,675
Fuel stock and materials and supplies	(9,088)	32,142	27,217
Other	(10,890)	3,348	6,782
Total	753	43,188	49,017
Current liabilities:			
Accounts payable	26,509	7,037	35,660
Taxes and interest accrued	9,124	5,921	2,663
Current portion of long-term debt	22,075	3,600	3,930
Other	16,225	8,071	10,327
Total	73,933	24,629	52,580
Increase (decrease) in working capital (exclusive of notes payable and temporary cash investments)	$ (73,180)	$ 18,559	$ (3,563)

See Notes to Consolidated Financial Statements.

Consolidated Balance Sheets

(Thousands of Dollars)

Assets

	December 31, 1980	December 31, 1979
Property, Plant and Equipment - At Cost:		
Plant:		
Production	$1,881,347	$1,578,928
Transmission	333,698	299,483
Distribution	879,551	779,741
General	214,849	183,144
Construction work in progress	1,143,102	972,526
Nuclear fuel in process	104,947	83,947
Coal handling equipment	109,835	81,358
Electric plant acquisition adjustments	3,166	3,166
Oil, gas and mining property	196,364	129,226
Total	4,866,859	4,111,519
Less accumulated depreciation, depletion and amortization	735,550	622,656
Property, plant and equipment - net	4,131,309	3,488,863
Current Assets:		
Cash in banks	13,027	12,690
Temporary cash investments, at cost	2,000	52,129
Working funds and special deposits	5,382	5,269
Accounts receivable:		
Customers	84,247	63,853
Others	22,652	22,578
Fuel stock:		
Oil, at average cost	66,364	47,843
Coal, at lifo cost	23,277	50,015
Materials and supplies, at average cost	32,107	32,978
Other	3,239	14,316
Total	252,295	301,671
Deferred Debits	49,334	44,163
Total	$4,432,938	$3,834,697

See Notes to Consolidated Financial Statements.

Consolidated Balance Sheets

(Thousands of Dollars)

Liabilities

	December 31, 1980	December 31, 1979
Common Stock Equity:		
Common stock, no par; authorized 75,000,000 shares; outstanding 42,644,520 shares at December 31, 1980 and 35,952,287 shares at December 31, 1979 (1,097,999 shares reserved at December 31, 1980 and 1,063,062 shares at December 31, 1979 for conversion of 5½% convertible debentures due 1985)	$ 767,137	$ 591,865
Retained earnings	731,406	652,573
Total	1,498,543	1,244,438
Preference Stock - no par, authorized 10,000,000 shares; none outstanding		
Cumulative Preferred Stock of Subsidiary (statement on following page)	243,518	243,518
5½% Convertible Debentures due 1985 (convertible into common stock of the Company at a rate of $35.98 a share at December 31, 1980 and $37.55 a share at December 31, 1979)	39,506	39,918
Long-Term Debt of Subsidiaries (statement on following page)	1,604,337	1,497,390
Total	3,385,904	3,025,264
Current Liabilities:		
Notes payable	126,500	88,614
Accounts payable	149,174	122,665
Taxes accrued	33,525	26,206
Interest accrued	31,110	29,305
Accrued liabilities to municipalities	45,557	36,008
Dividends declared	5,010	5,010
Current portion of long-term debt	29,605	7,530
Other	23,147	16,471
Total	443,628	331,809
Deferred Credits:		
Accumulated deferred federal income taxes	332,556	252,176
Unamortized investment tax credit	244,704	202,148
Other	17,761	14,931
Total	595,021	469,255
Property Insurance Reserve	8,385	8,369
Commitments and Contingencies		
Total	$4,432,938	$3,834,697

See Notes to Consolidated Financial Statements

Statements of Subsidiaries' Preferred Stock and Long-Term Debt

(Thousands of Dollars)

	December 31, 1980	December 31, 1979
Cumulative Preferred Stock - no par; authorized 10,000,000 shares; outstanding (entitled upon involuntary liquidation to $100 a share)		
Houston Lighting & Power Company:		
$4 series, 97,397 shares	$ 9,740	$ 9,740
$6.72 series, 250,000 shares	25,115	25,115
$7.52 series, 500,000 shares	50,225	50,225
$9.52 series, 400,000 shares	39,372	39,372
$9.08 series, 400,000 shares	39,395	39,395
$8.12 series, 500,000 shares	50,098	50,098
$9.04 series, 300,000 shares	29,573	29,573
Total	$ 243,518	$ 243,518
Long-Term Debt:		
Houston Lighting & Power Company:		
First mortgage bonds:		
3¼%, series due 1981	$ 20,000	$ 20,000
2¾%, series due 1985	30,000	30,000
3¼%, series due 1986	30,000	30,000
4¾%, series due 1987	40,000	40,000
3%, series due 1989	30,000	30,000
4⅞%, series due 1989	25,000	25,000
4½%, series due 1992	25,000	25,000
5¼%, series due 1996	40,000	40,000
5¼%, series due 1997	40,000	40,000
6¾%, series due 1997	35,000	35,000
6¾%, series due 1998	35,000	35,000
7½%, series due 1999	30,000	30,000
7¼%, series due 2001	50,000	50,000
7½%, series due 2001	50,000	50,000
8⅛%, series due 2004	100,000	100,000
10⅛%, series due 2004	100,000	100,000
8¾%, series due 2005	125,000	125,000
8⅜%, series due 2006	125,000	125,000
8⅜%, series due 2007	125,000	125,000
8⅞%, series due 2008	125,000	125,000
9¼%, series due 2008	100,000	100,000
11¼%, series due 2009	125,000	125,000
12%, series due 2010	100,000	
Total	1,505,000	1,405,000
Pollution control revenue bonds:		
7⅜% series, due 2004	18,000	18,000
9½% series, due 1998	19,200	19,200
9.9% series, due 1998	5,000	
Utility Fuels, Inc.:		
9% secured notes, maturing $7,200 annually through 1988	54,200	61,400
Variable rate secured note, due 1983	9,800	
Capitalized lease obligations	21,752	
Other	990	1,320
Subtotal	1,633,942	1,504,920
Less current maturities	29,605	7,530
Total	$1,604,337	$1,497,390

See Notes to Consolidated Financial Statements.

Statements of Consolidated Retained Earnings

(Thousands of Dollars)

	Year Ended December 31,		
	1980	1979	1978
Balance at Beginning of Period	$652,573	$569,364	$505,165
Add - Net Income	183,981	161,846	128,657
Total	836,554	731,210	633,822
Deduct - Common Stock Dividends: 1980, $2.68; 1979, $2.36; 1978, $2.12 (a share)	105,148	78,637	64,458
Balance at End of Period	$731,406	$652,573	$569,364

See Notes to Consolidated Financial Statements.

Notes to Consolidated Financial Statements

For the Three Years Ended December 31, 1980

1. Summary of Significant Accounting Policies

System of Accounts

The accounting records of Houston Lighting & Power Company (HL&P), the principal subsidiary, are maintained in accordance with the Federal Energy Regulatory Commission's Uniform System of Accounts which have been adopted by the Public Utility Commission of Texas (Utility Commission).

Principles of Consolidation

The consolidated financial statements include the accounts of the Company and its wholly owned subsidiaries, HL&P, Primary Fuels, Inc. (PFI) and Utility Fuels, Inc. (UFI). Coal sales and related cost of coal sold represent UFI coal sales to HL&P and are not eliminated because of the distinction for regulatory purposes between utility and non-utility operations. All other significant intercompany transactions and balances are eliminated in consolidation.

Plant

Additions to electric plant, reduced by contributions in aid of construction, betterments to existing property, and replacements of units of property are capitalized at cost. Cost includes the original cost of contracted services, direct labor and material, indirect charges for engineering supervision and similar overhead items, and an allowance for funds used during construction (AFUDC).

Maintenance of property and replacements and renewals of items determined to be less than units of property are charged to expense. The actual or average book cost of units of property replaced or renewed are removed from plant and such costs plus removal cost, less salvage, are charged to accumulated depreciation.

HL&P and UFI compute depreciation using the straight-line method. The depreciation provision as a percentage of the depreciable cost of plant was 3.6% for 1980 and 1979 and 3.3% for 1978.

Oil and Gas Property

The full-cost method of accounting is used for oil and gas operations. Accordingly, all costs of acquisition, exploration, and development of properties are capitalized. Depreciation, depletion and amortization of these costs are determined on the unit-of-production method based on the estimated proved reserves of oil and gas properties. Depreciation, depletion and amortization amounted to $20,895,000, $11,350,000 and $5,737,000, or $1.10, $.62 and $.48 per equivalent unit-of-production for the years ended December 31, 1980, 1979 and 1978, respectively.

Allowance for Funds Used During Construction

Prior to 1979, HL&P accrued AFUDC at a rate of 6½% on projects estimated to cost in excess of $50,000 and estimated to require more than 90 days to construct. During 1979, HL&P accrued AFUDC at a 7½% rate, net of federal income taxes, on construction projects and nuclear fuel payments except for amounts included in the rate base by regulatory authorities. Effective January 1, 1980, the accrual rate was increased to 8½%, net of federal income taxes. The borrowed funds component of AFUDC, before federal income taxes, is reflected in the Statements of Consolidated Income as a credit to fixed charges and the other funds component is shown as other income.

In 1980, UFI began capitalizing interest applicable to qualifying assets. Such amounts are included in the borrowed funds component of AFUDC in the Statements of Consolidated Income.

Revenues - Electric

Revenues are recognized from the sale of electricity as bills are rendered to customers. Rate schedules include fuel adjustment clauses which permit recovery of fuel expenses in the month incurred.

Federal Income Taxes
Since January 1979, the Company has followed a policy of comprehensive interperiod income tax allocation. Prior to January 1979, deferred income taxes were not recognized on the borrowed funds component of AFUDC which is deducted currently for federal income tax purposes.

Investment tax credits are deferred and amortized over the estimated lives of the related property.

Property Insurance Reserve
The cost of replacing uninsured plant losses of HL&P, less related tax effects, are charged against the reserve when incurred. Effective January 1980, additional accruals to the reserve have been denied by regulatory authorities.

Earnings Per Common Share
Earnings per common share are computed by dividing net income by the weighted average number of shares outstanding during the respective periods. Common stock equivalents outstanding during the periods did not have a material dilutive effect on earnings per share.

2. Common Stock. At the 1980 Annual Meeting of Shareholders, a resolution was approved to amend the Articles of Incorporation to increase the authorized common stock, without par value, from 50,000,000 to 75,000,000 shares. Common stock issued during 1980, 1979 and 1978 amounted to 6,692,233 shares, 4,863,185 shares and 2,260,866 shares, respectively.

3. Preferred Stock. Any part or all of HL&P's preferred stock may be redeemed at the option of the Company at the following per share prices, plus any unpaid accrued dividends to date of redemption:

$4 Series - $105.00. $6.72 Series: through July 31, 1988 - $103.51; thereafter - $102.51. $7.52 Series: through October 31, 1982 - $105.35; thereafter - $108.35 to $102.35. $9.52 Series: through September 30, 1985 - $109.52; thereafter - $105.00 to $101.00. $9.08 Series: through March 31, 1981 - $109.08; thereafter - $105.00 to $101.00. $8.12 Series: through November 30, 1982 - $109.37; thereafter - $106.25 to $102.25. $9.04 Series: through January 31, 1984 - $109.04; thereafter - $106.00 to $101.00.

4. Long-Term Debt. At December 31, 1980, sinking or improvement fund requirements of HL&P's first mortgage bonds outstanding will be $27,850,000 for the year 1981, $28,700,000 in 1982 and $29,700,000 for each of the years 1983 through 1985. Of such requirements, $15,050,000 for the year 1981 and $14,850,000 for each of the years 1982 through 1985 may be satisfied by certification of property additions at 100% of the requirements and the remainder through certification of such property additions at 166⅔% of the requirements. Sinking or improvement fund requirements for 1980 and prior years have been satisfied by certification of property additions.

Annual maturities of long-term debt are approximately $27,580,000 in 1981, $7,530,000 in 1982, $17,330,000 in 1983, $7,200,000 in 1984 and $76,706,000 in 1985. At December 31, 1980, the future minimum lease payments under the UFI capital leases are $2,075,000 for the year 1981, and $2,334,000 for each of the years 1982 through 1985, and $26,840,000 thereafter through 1997. The present value of the $38,251,000 minimum lease payments at December 31, 1980 is approximately $21,752,000, at an assumed discount rate of 7.4%.

The issuable amount of HL&P first mortgage bonds is unlimited as to authorization, but limited by property, earnings, and other provisions of the mortgage and deed of trust and the supplemental indentures thereto. Substantially all properties of HL&P and UFI are subject to liens securing their long-term debt.

5. Short-Term Financing. The interim financing requirements of the Company's operating subsidiaries are met through short-term bank loans and the issuance of commercial paper. The subsidiaries have bank lines of credit aggregating $410,000,000 (as compared with $315,000,000 during 1979) which limit their total short-term borrowings and provide for interest at the prime rate. Bank loans and commercial paper outstanding were $78,300,000 and $47,330,000 at December 31, 1980 and $57,100,000 and $30,430,000 at December 31, 1979, respectively. Compensating balances are not required under the lines of credit.

6. Retirement Plan. The Company has a noncontributory retirement plan covering substantially all employees. The policy of the Company is to fund pension costs accrued, which includes amortization of prior service costs, over a period of thirty to forty years.

The total cost of the Company's retirement plan for the years 1980, 1979 and 1978 was $7,563,000, $6,223,000 and $4,773,000, respectively. In 1979, the assumed return on plan investments was increased to 7% and the plan was amended to provide substantially increased benefits for all plan participants. The net effect of the change and amendment was to increase prior service costs by $14,210,000 and pension costs accrued by $1,400,000 for 1979. As of January 1, 1980, actuarially computed prior service costs were $34,047,000. A comparison of accumulated plan benefits and plan net assets for the Company's retirement plan is presented below:

Actuarial present value of accumulated plan benefits:

	January 1, 1980	1979
Vested	$49,280,000	$49,139,000
Nonvested	4,179,000	2,341,000
	$53,459,000	$51,480,000
Market Value of net assets available for plan benefits	$67,272,000	$50,680,000

7. Commitments and Contingencies. Significant commitments have been incurred in connection with HL&P's construction program and for nuclear fuel purchases. The construction program (exclusive of AFUDC) is presently estimated to cost about $691 million in 1981, $759 million in 1982 and $947 million in 1983. An additional $60 million is expected to be spent for uranium concentrate and nuclear fuel processing services for HL&P's South Texas and Allens Creek nuclear plants. Commitments in connection with HL&P's construction program, principally for generating plants and related facilities, are generally revocable by HL&P subject to reimbursement of manufacturers for expenditures incurred or other cancellation penalties. In addition, during the 1981-1983 period, UFI expects to spend $79 million for coal handling equipment and railroad cars in order to serve HL&P's W. A. Parish plant and $11 million for transportation equipment and lignite mining and handling facilities for HL&P's Limestone plant. PFI expects to spend approximately $71 million on exploratory and development activities during 1981.

UFI has entered into financing arrangements for coal transportation equipment which are treated as capital leases for financial accounting purposes. The Company has no other material lease commitments.

8. Jointly Owned Electric Plant. HL&P is project manager and one of four participants in the South Texas Nuclear Project which consists of two 1250 megawatt nuclear generating units. Each participant finances its own share of construction expenditures with HL&P's participating interest in the project being 30.8%. As of December 31, 1980, HL&P's share of expenditures included in construction work in progress and nuclear fuel in process were $450 million and $39 million, respectively.

9. Regulatory Proceedings. As part of the Utility Commission's final rate order in January 1980, the Utility Commission disallowed HL&P's request to amortize its investment in a uranium exploration project terminated in October 1978. As a result, $4,661,000 (net of federal income taxes) was charged against HL&P's income in the month of December 1979. A number of accounting changes were implemented by HL&P in January 1980 as a result of the Utility Commission's January 1980 order. Such changes include (1) the capitalization of ad valorem taxes related to construction work in progress (2) the capitalization of employee benefits and depreciation of transportation equipment related to construction and (3) the discontinuance of accruals to the reserves for property insurance and injuries and damages.

10. Federal Income Taxes. Effective federal income tax rates are lower than statutory corporate rates for each year as follows:

	Year Ended December 31		
	1980	1979	1978
	Thousands of Dollars		
Income before federal income taxes	$318,084	$280,153	$227,436
Preferred dividends of subsidiary	20,042	19,765	17,330
Total	338,126	299,918	244,766
Statutory rate	46%	46%	48%
Federal income taxes at statutory corporate rate	155,538	137,962	117,487
Reduction in taxes resulting from:			
Allowance for other funds used during construction	15,058	14,687	13,761
Other—net	6,377	4,968	4,947
Total	21,435	19,655	18,708
Federal income taxes	$134,103	$118,307	$ 98,779
Effective rate	39.7%	39.4%	40.4%

At December 31, 1980, the Company had an investment tax credit carryover of approximately $8,570,000.

11. Supplementary Expense Information

	Year Ended December 31		
	1980	1979	1978
	Thousands of Dollars		
Taxes, other than income taxes, were charged to expenses as follows:			
Electric			
Ad valorem	$42,686	$42,666	$38,131
State gross receipts	20,717	16,044	12,686
Payroll	7,467	6,189	4,897
PUC assessment	3,671	2,885	2,079
Miscellaneous	6,315	5,069	4,458
Total	80,856	72,853	62,251
Taxes included in oil and gas operating expenses	5,081	3,778	2,399
Total taxes other than income taxes	$85,937	$76,631	$64,650
Research and development costs charged to expenses	$12,146	$10,152	$ 8,775

12. Unaudited Quarterly Information. The following unaudited quarterly financial information for 1979 and 1980 includes, in the Company's opinion, all adjustments (which comprise only normal recurring accruals) necessary for a fair presentation.

	Revenues	Net Operating Income	Net Income	Earnings per Common Share (a)
	Thousands of Dollars			
March 31, 1979	$385,216	$ 73,063	$30,755	$ .96
June 30, 1979	448,962	85,599	36,676	1.11
September 30, 1979	550,987	129,037	60,998	1.84
December 31, 1979	468,994	83,317	33,417(b)	.95
March 31, 1980	459,307	70,288	28,176	.78
June 30, 1980	581,425	93,890	39,892	1.03
September 30, 1980	755,713	169,937	79,239	2.01
December 31, 1980	570,817	95,622	36,674(c)	.86

(a) Quarterly earnings per common share are based on the weighted average number of shares outstanding during the quarter and the sum of the quarters may not equal annual earnings per common share.

(b) See Note 9, "Regulatory Proceedings" regarding the December, 1979 charge against HL&P's income.

(c) See "Management's Discussion and Analysis of Financial Condition and Results of Operations" concerning the December, 1980 charge against PFI's income.

13. Reclassification. Certain amounts from previous years have been reclassified to conform to the 1980 presentation of the financial statements. Such reclassifications are immaterial and do not affect earnings.

14. Other. On January 5, 1981, the Company's Board of Directors recommended a three-for-two stock split and an increase in the authorized common stock from 75,000,000 to 125,000,000 shares. The stock split and the authorization to increase common stock are subject to shareholder approval at the 1981 Annual Meeting of Shareholders.

On February 10, 1981, HL&P issued $125,000,000 of 13⅞% First Mortgage Bonds due February 1, 1991.

On March 6, 1981 (subsequent to the date of the auditors' opinion) the Company sold 3,000,000 shares of common stock at a public offering price per share of $25.25. The net proceeds of the sale were invested in the common stock of HL&P and were used by HL&P to defray the cost of its construction program including the repayment of short-term debt incurred in connection with such program. To the extent that such proceeds were not immediately so used, they were temporarily invested in short-term interest bearing obligations. As a result of the sale, the conversion price for the outstanding 5½% convertible debentures was changed from $35.98 to $35.25 per share and the number of shares of common stock reserved for conversion for such debentures was increased from 1,096,697 to 1,119,404.

AUDITORS' OPINION

Houston Industries Incorporated:

We have examined the consolidated balance sheets and the statements of subsidiaries' preferred stock and long-term debt of Houston Industries Incorporated and subsidiaries as of December 31, 1980 and 1979 and the related statements of consolidated income, consolidated retained earnings and changes in consolidated financial position for each of the three years in the period ended December 31, 1980. Our examinations were made in accordance with generally accepted auditing standards and, accordingly, included such tests of the accounting records and such other auditing procedures as we considered necessary in the circumstances.

In our opinion, the above-mentioned consolidated financial statements present fairly the financial position of the Company and subsidiaries at December 31, 1980 and 1979 and the results of their operations and the changes in their financial position for each of the three years in the period ended December 31, 1980, in conformity with generally accepted accounting principles applied on a consistent basis.

DELOITTE HASKINS & SELLS

Houston, Texas
February 16, 1981

Supplementary Information to Disclose the Effects of Changing Prices (Unaudited)

Financial statements of business enterprises, in accordance with generally accepted accounting principles, reflect historical costs and dollars of varying purchasing power and accordingly do not measure the effects of inflation. The following unaudited supplementary information is supplied in accordance with the requirements of Financial Accounting Standards Board (FASB) Statement No. 33, Financial Reporting and Changing Prices, for the purpose of providing certain information regarding the effects of both general inflation (constant dollars) and changes in specific prices (current cost), which are not reflected in traditional financial statements. Constant dollar amounts represent historical costs stated in terms of dollars of equal purchasing power, as measured by the Consumer Price Index for all Urban Consumers (CPI-U). Current cost amounts reflect the changes in specific prices of property from the date the property was acquired to the present and may differ from constant dollar amounts to the extent that specific prices have increased more or less rapidly than prices in general. This information should be viewed only as an estimate of the approximate effect of inflation rather than as a precise measurement.

The Company's principal subsidiary, HL&P, in common with other electric utility companies in general, continues to be adversely impacted by the effects of an inflationary economy. Certain effects of inflation such as higher interest costs associated with long-term bonds and increased operating and maintenance costs are reflected in traditional financial statements. Increased revenues to recover such expenses, however, tend to lag behind the actual incurrence of such increased costs. Electric rates are established based on costs as of a specific point in time and are designed to allow the electric utility to recover its operating costs and earn a fair rate of return on its investment in property, plant and equipment. However, in a highly inflationary environment, expenses have increased at a much greater rate than the increase in electric sales which has resulted in an erosion of return on invested capital. It is unlikely that rates based on historical costs can keep pace with increased costs during inflationary periods. This has resulted, in part, in the need for larger and more frequent rate increases.

There are a number of other effects of inflation which are not reflected in traditional financial statements and to which the accompanying supplementary information is intended to give effect. One major expense so affected is depreciation. The cost of constructing and replacing property, plant and equipment has been escalating dramatically. Historical financial statements reflect depreciation based on the historical costs of assets and do not reflect the true economic cost of the asset "used up" and which must be replaced at substantially higher future values. However, a substantial amount of such assets are financed with long-term bonds and preferred stock which effectively acts as a hedge against the impact of inflation. Utility plants financed from investment by common shareholders and retained earnings are not afforded such a hedge. While a certain amount of the impact on such depreciation is reduced through higher returns allowed on the common equity investment in property when electric rates are established, the end result of continuing inflation is an erosion of the common shareholder's investment when viewed in terms of real purchasing power.

The Company has made signficant increases in the common stock dividend over the last several years. Actual annual cash dividends have increased from $1.61 in 1976 to $2.68 in 1980. However, when restated in terms of average 1980 dollars, the dividend increases appear much more modest, going from $2.33 in 1976 to $2.68 in 1980. It is significant that the common stock dividends, in real terms, have been able to keep pace with inflation over the last five years, a period of very high inflation. When restated in terms of average 1980 dollars, the last three years annual dividend rate was $2.68. While this indicates that no real growth has occurred in common stock dividends, the purchasing power of common dividends has been maintained.

Statement of Consolidated Income Adjusted For Changing Prices

For the Year Ended December 31, 1980 (In Thousands of Dollars)	Conventional Historical Cost	Constant Dollar Average 1980 Dollars	Current Cost Average 1980 Dollars
Revenues	$2,367,264	$2,367,264	$2,367,264
Expenses:			
Electric	1,618,788	1,618,788	1,618,788
Cost of coal sold	180,373	180,373	180,373
Oil and gas operating expenses	8,883	8,883	8,883
Depreciation, depletion and amortization	129,483	227,942	239,251
Income taxes	134,103	134,103	134,103
Fixed charges and other income — net	111,653	111,653	111,653
Net Income (excluding reduction to net recoverable cost)	$ 183,981	$ 85,522*	$ 74,213
Increase in specific prices (current cost) of property, plant, and equipment held during the year**			$ 637,939
Less increase in cost of property, plant, and equipment adjusted for changes in general price level			745,144
Excess of increase in general price level over increase in specific prices			(107,205)
Reduction of utility property to net recoverable costs		(329,671)	(204,446)
Gain from decline in purchasing power of net amounts owed		286,744	286,744
Net		$ (42,927)	$ (24,927)

* Including the reduction to net recoverable cost, loss on a constant dollar basis would have been $244,149 for 1980.

** At December 31, 1980, current cost of property, plant and equipment, net of accumulated depreciation was $7,022,944, while historical cost was $4,131,309.

Property, plant and equipment as referred to in the accompanying data includes utility plant in service, land, land rights and property held for future use, nuclear fuel in process, construction work in progress, coal handling equipment and oil, gas and mining property. The constant dollar information was determined by adjusting historical amounts by the ratio of the average level of the CPI-U during the year the assets were acquired or constructed to the average CPI-U index for 1980. Current cost of utility properties was determined primarily by indexing surviving plant by the Handy-Whitman Index of Public Utility Construction Costs. Oil and gas properties were restated to current costs primarily by adjusting historical costs by externally developed indexes for onshore and offshore properties. Current cost information does not represent the replacement cost of the Company's productive capacity since plant would not be replaced precisely in kind, but rather are an approximation of the current cost of existing assets.

The constant dollar and current cost provisions for depreciation were determined by applying the Company's historical depreciation rates to the restated property amounts. Restatement of depreciation, depletion and amortization of oil, gas and mining properties was computed by applying historical unit-of-production rates to the restated property amounts.

As allowed by FASB No. 33, items in the income statement, other than depreciation expenses, were not adjusted. The cost of fuel used in electric generation and operating and maintenance expenses are essentially stated in terms of average current year prices and therefore do not require restatement.

In accordance with FASB No. 33, federal income tax expense has not been adjusted. Current federal income tax policy recognizes to a certain extent the effects of inflation. Liberalized depreciation allowances and the investment tax credit accelerate capital recovery. However, as the statutory federal income tax rate has remained stable the effective rate has increased significantly as a result of the declining purchasing power of the related taxable income. The Company's effective federal income tax rate in 1980, when adjusted for inflation, is 56 percent under constant dollar and 59 percent under current cost, each of which exceeds its reported effective tax rate of 40 percent and the statutory rate of 46 percent.

Five Year Comparison of Selected Supplementary Financial Data Adjusted for Effects of Changing Prices

(In Thousands of average 1980 dollars, except per share amounts)

	1980	1979	1978	1977	1976
Revenues					
Historical	$2,367,264	$1,854,159	$1,349,438	$1,095,561	$ 851,174
Constant dollar	2,367,264	2,104,905	1,704,408	1,489,722	1,232,081
Net Income					
Historical	$ 188,981	$ 161,846			
Constant dollar	85,522	102,284			
Current cost	74,213	86,194			
Earnings per share					
Historical	$ 4.71	$ 4.84			
Constant dollar	2.19	3.05			
Current cost	1.90	2.58			
Common Stock Equity at year-end (including electric utility property only to the extent recoverable)					
Historical	$1,498,543	$1,244,438			
Constant dollar	1,490,689	1,374,477			
Current cost	1,495,413	1,374,842			
Gain from decline in purchasing power of net amounts owed	$ 286,744	$ 301,485			
Excess of increase in general price level over increase in specific prices	$ 107,205	$ 304,527			
Cash dividends declared per common share					
Historical	$2.68	$2.36	$2.12	$1.86	$1.61
Constant dollar	2.68	2.68	2.68	2.53	2.33
Market price per common share at year end					
Historical	$28½	$29⅛	$27⅜	$30⅝	$31¾
Constant dollar	27¼	31¼	33¼	40⅝	44
Average consumer price index	246.8	217.4	195.4	181.5	170.5

Under the rate making prescribed by the regulatory authorities to which HL&P is subject, only the historical cost of plant is recoverable through depreciation. Therefore the excess of the cost of utility plant stated in terms of constant dollars and current cost that occurred as a result of inflation in the current year over the historical cost of utility plant is not presently recoverable in rates as depreciation and is reflected as a reduction to net recoverable cost.

To properly reflect the economics of rate regulation in the Statement of Income Adjusted for Changing Prices, the reduction of net property, plant, and equipment should be offset by the gain from the decline in purchasing power of net amounts owed. During a period of inflation, holders of monetary assets suffer a loss of general purchasing power while holders of monetary liabilities experience a gain. The gain from the decline in purchasing power of net amounts owed is primarily attributable to the substantial amount of debt and preferred stock which has been used to finance property, plant and equipment. However, since the depreciation on this utility plant is limited to the recovery of historical costs, HL&P does not have the opportunity to realize a holding gain, and is limited to recovery only of the embedded cost of such capital. Thus, to the extent that utility plant is financed with debt and preferred stock the reduction to net recoverable cost and the holding gain essentially offset each other.

As indicated above, the rates charged by HL&P are regulated. As a result it is not as free as a non-regulated enterprise to raise its prices in response to inflation. Further, except in the case of fuel costs, the regulatory process introduces a substantial time lag between the incurrence of operating and capital costs and the recovery of such costs. This is commonly referred to in the industry as "regulatory lag" and is one of the most significant factors contributing to the erosion of investor capital. Compounding the problem is the fact that the HL&P must compete in the same marketplace as a non-regulated enterprise for capital necessary to finance its construction program.

Houston Industries Incorporated

Directors

Searcy Bracewell (A,C)
Member of Law firm of
Bracewell & Patterson
Houston, Texas

Wm. R. Brown (A,C)
Member of Law firm of
Baker & Botts and General
Counsel of the Company
Houston, Texas

H. R. Dean (B)
Vice President and Treasurer
of the Company
Houston, Texas

John C. Echols (A,B)
Chairman of the Board
and Chief Executive Officer
Citizens Bank & Trust Co.
Baytown, Texas

Howard W. Horne (B,D)
President of The Horne
Company
Houston, Texas

D. D. Jordan (A,B)
President and Chief Executive
Officer of the Company
Houston, Texas

Thomas B. McDade (B,C)
Vice Chairman of the Board
Texas Commerce Bancshares
Houston, Texas

G. W. Oprea, Jr. (B)
Vice President of the
Company
Houston, Texas

Stewart Orton (A,D)
Chairman of the Board
and Chief Executive Officer
Foley's
Houston, Texas

Willard E. Walbridge (A,D)
Consultant to Capital
Cities Communications, Inc.
Houston, Texas

Joe C. Wessendorff (C,D)
Ranching and Investments
Richmond, Texas

(A) Member of Executive Committee
(B) Member of Finance Committee
(C) Member of Executive Salary Committee
(D) Member of Audit Committee

Officers

D. D. Jordan
President and Chief Executive Officer

G. W. Oprea, Jr.
Vice President

H. R. Dean
Vice President and Treasurer

J. R. Johnston
Secretary and Assistant Treasurer

J. S. Brian
Assistant Secretary & Assistant Treasurer

Wm. R. Brown
General Counsel

Houston Lighting & Power Company

Officers

D. D. Jordan
President and Chief Executive Officer

G. W. Oprea, Jr.
Executive Vice President

J. D. Cowart
Group Vice President
Administrative

H. R. Dean
Group Vice President
Accounting & Finance

K. R. Hinckley
Group Vice President
Corporate Planning & Development

A. R. Beavers
Vice President
Purchasing & Services

R. L. Evans, Jr.
Vice President
Energy Supply

R. M. McCuistion
Vice President
Power System Development

C. L. McNeese
Vice President &
Assistant to the President

D. E. Simmons
Vice President
System Engineering & Operations

D. D. Sykora
Vice President
Customer & Public Relations

J. H. Goldberg
Vice President
Nuclear Engineering & Construction

E. A. Turner
Vice President
Fossil Plant Engineering & Construction

J. R. Johnston
Secretary and Treasurer

R. S. Letbetter
Comptroller

J. S. Brian
Assistant Secretary and Assistant Treasurer

F. C. Gemar
Assistant Secretary and Assistant Treasurer

Wm. R. Brown
General Counsel

Annual Meeting
The annual meeting of shareholders will be held May 13, 1981, at 10 a.m. in the Electric Tower, 611 Walker, Houston, Texas. A formal notice of the meeting accompanied by a proxy statement and proxy form will be mailed to shareholders on or about April 10, 1981.

Executive Offices
Electric Tower, Houston, Texas Mail Address: 611 Walker, P.O. Box 1700, Houston, Texas 77001
Telephone: (713) 228-2474

Stock Listing
Houston Industries common stock is traded under the symbol HOU on the New York and Midwest Stock exchanges.

Transfer Agent for the Common Stock
Texas Commerce Bank National Association, Houston, Texas P.O. Box 2558, Houston, Texas 77001

Registrar for the Common Stock
First City National Bank of Houston, Houston, Texas P.O. Box 2557, Houston, Texas 77001

Trustee Under Indenture for Convertible Debentures
Bankers Trust Company, New York, New York

Auditors
Deloitte Haskins & Sells, Houston, Texas

Counsel
Baker & Botts, Houston, Texas

Dividend Disbursing Agent for the Common Stock
Texas Commerce Bank National Association, Houston, Texas

Dividend Reinvestment for the Common Stock
For the convenience of shareholders, dividends may be automatically reinvested in Houston Industries common stock. For information, contact Ms. Ann Cherry, Texas Commerce Bank, P.O. Box 2558, Houston, Texas 77001. (713) 236-4636.

Shareholder Information
Stockholder Records can help shareholders with inquiries about lost, stolen or destroyed certificates, nonreceipt of dividend checks, transferring shares and similar matters. Any change of address also should be sent to the attention of Ms. Cherry.

Financial Information
Prospective investors, analysts and representatives of financial institutions requiring information regarding Houston Industries should contact Jim Brian, Assistant Secretary & Assistant Treasurer (713) 229-7248, at the executive offices.

News Media Inquiries
Members of the news media and others needing information regarding HL&P's corporate activities should contact Jim Parsons, General Manager of Public Affairs, (713) 229-7123, at the executive offices.

SEC Form 10-K
A copy of the annual report to the Securities and Exchange Commission on Form 10-K may be obtained without charge upon written request to: J. R. Johnston, Secretary, at the Houston Industries executive offices.

Design: Graphic Designer's Group
Photography: Peter Claussen

Austin's Albatross: 'The Nuke' Melts Down City Funds

By Martha Hamilton
Washington Post Staff Writer

AUSTIN, Tex.—This central Texas city is stuck with a $437 million investment that it doesn't want but can't unload, and which is sure to cost millions more.

Austin's albatross is the South Texas Nuclear Project (STNP), which looked more like a winner in 1973 when the city joined the partnership to build it in Matagorda County. But, as has happened frequently around the nation, the need for the new generating plant became less urgent as its cost climbed and conservation efforts succeeded. Austin itself has become a model of what conservationists have preached: its municipally owned electric company has shifted its focus from construction of large power generating plants to providing for growth through conservation.

Nationwide, since 1975, 116 power plants have been canceled, 85 of them nuclear. That represents more than the combined electric generating capacity of Texas and California.

But Austin's situation was complicated by the fact that it couldn't merely cut its losses by abandoning the partnership, because that would jeopardize its credit rating. Meanwhile, construction of The Nuke, as the project is referred to here, continues its claim on the city's purse.

In 1981, Austin voters approved the sale of the city's 16 percent interest in the project, which would have provided an escape from the predicament. But, not surprisingly, no buyer stepped forward.

As a result, two months ago voters returned to the polls to approve $97 million in additional bonding authority to continue payments on the plant.

"This is the most difficult letter that I have ever written to you," city council member Roger Duncan wrote to his constituents in appealing for their support for the additional authority.

Beginning as a young political activist in the early 1970s, Duncan has been a consistent foe of the nuclear facility.

"Now I find myself in the position of being a salesman on the project," he said in a recent interview. "We've done a complete marketing study. We looked at neighboring and other states; we talked to Mexico about the possibility of a natural gas-electricity trade, but none of them were interested."

Money to pay for Austin's share in the project, which has been plagued by huge cost overruns and delays, would have run out in April. Not making the payments would have threatened Austin's bond ratings.

"I hate to vote another dollar for STNP, but our choice is between that and destroying the heart of this city while being stuck with STNP in the process," Duncan wrote. The additional authorization was approved with approximately 76 percent of the vote.

At the same time Austin's city council was seeking the funds to avoid missing payments on the power plant, it was trying another tactic to get rid of its share. On Jan. 6, City Attorney Albert DeLaRosa filed a lawsuit against Houston Lighting & Power Co., the managing partner of the project.

See AUSTIN, K5

The Washington Post, Sunday, March 6, 1983, K1

Nuclear Project Confronts Austin With Dilemma

AUSTIN, From K1

In the suit, the city claims it was misled by both the Houston utility and Brown and Root Inc., the firm that acted as architectural engineers on the project until September 1981. Brown and Root was fired and replaced by Bechtel Power Corp. shortly after releasing figures showing that the projected cost of the project had climbed from an initial estimate of $1 billion to between $4.4 billion and $4.8 billion. The latest estimate for the project is $5.5 billion.

Austin claims that Brown and Root did not have the expertise required by the project and that Houston Lighting & Power failed to manage it properly. Those failures, Austin argued, should entitle the city to sell its share in the project back to Houston Lighting & Power for the $437 million the city has already spent.

Otherwise, Austin is stuck for the forseeable future. If the city defaults on its payments, "that's a way to really get stuck with the plant," Duncan said. Doing so would mean that Austin would lose its right to choose an arbitrator to settle grievances that arise about the project.

In addition, the city would no longer be able to sell its share, because the other partners would have the option of buying Austin's percentage at cost up to the time operations begin, an option sure to discourage any other potential purchaser.

In addition to the Houston and Austin utilities, the city of San Antonio and Corpus Christi Central Power & Light Co. own shares in the project. San Antonio Mayor Henry Cisneros is said to have expressed a desire to unload part of that city's share in The Nuke.

In the meantime, the Austin electric utility department is buying into a lignite coal facility with the Lower Colorado River Authority. It is also trying to encourage conservation and power production by renewable energy sources to a large enough extent to eliminate the need for one additional power plant.

Among other things, the city provides free energy audits and below-market-rate loans for weatherization. Borrowers may repay the loans by adding their payments to electric bills. "We've found we can reduce electric use 30 to 50 percent on the average on commercial and residential buildings," said Duncan.

Most of the weatherization in Austin involves shading and other measures designed to beat the heat.

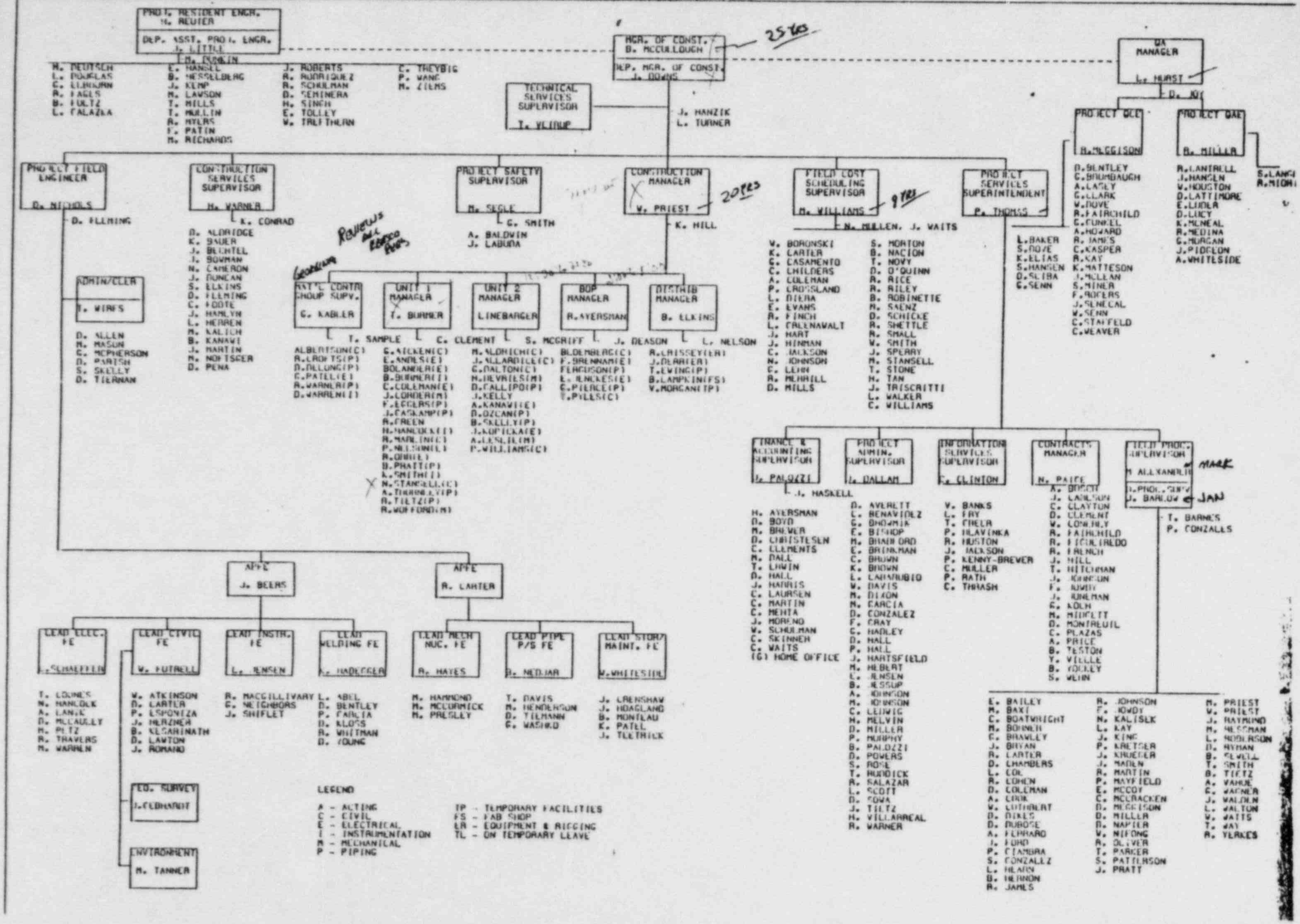
The utility runs other programs as well, including an appliance efficiency program. If customers buy energy-efficient air conditioners, for example, they can get a rebate from the electric company.

So far, the company has given away $300,000, but another $2 million has been allocated by the council. "We're now seeing a lot of big tract-housing builders joining in the program. That's very significant for the long run," said Laura Doll, a spokeswoman for the department.

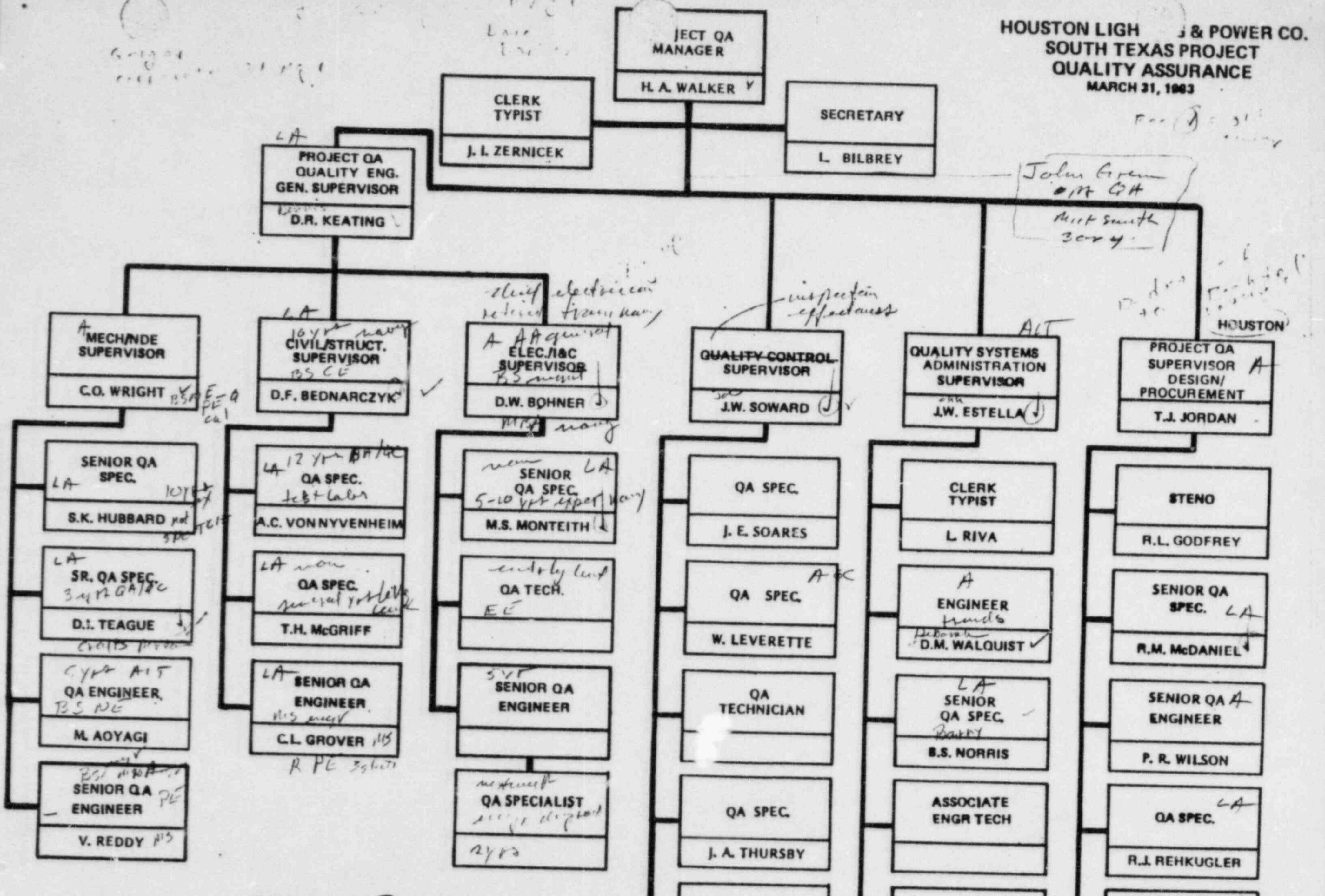
Since the city owns the utility, it can easily dedicate money to such measures, rather than depending on federal money or on a public service commission ordering a utility to institute conservation measures. "We have a tremendous advantage," Duncan said.

01-APR-83

HOUSTON LIGHTING AND POWER CO.
SOU   XAS PROJECT
BECHTE   RGY CORPORATION
JL   MBER 14926
CONSTRUCTION MANAGEMENT ORGANIZATION CHART
AS OF APRIL 1, 1983



HOUSTON LIGH[illegible]G & POWER CO.
SOUTH TEXAS PROJECT
QUALITY ASSURANCE
MARCH 31, 1983



APPROVED: [signature]

DATE: 4/6/83

March 31, 1983

TO: Distribution
FROM: J. W. Estella *J. W. Estella*
SUBJ: South Texas Project Electric Generating Station
Use of Procedures vs. Audits Matrix

Attached are the matrices of Procedures vs. Audits, Revision 0, Update 0. There are two classifications of manuals: program and procedure. Program manuals are:

HL&P - Project Quality Assurance Plan
Nuclear Quality Assurance Program Manual
BEC - Project Quality Program Manual
ASME Section III Quality Assurance Manual
ESI - Nuclear Quality Assurance Manual [ETR 1001]
ASME Section III Quality Assurance Manual

All identified sections of a program manual under each audit activity must be addressed on an annual basis; that is, by the end of 1983, all of the "O"s must be replaced by "X"s. If later on a section is determined to be not-applicable to a certain audit activity, the matrix will be revised.

For procedures, the matrix works slightly different. We must be able to show that all procedures have been audited at least once during each year. Thus, if a certain audit identifies a procedure which was already audited early in the year, it may not have to be audited again. Examples of when a procedure would be audited more than once are: 1) some aspects of the procedure were unsatisfactory; 2) some aspects were not applicable to the earlier audit; or 3) the procedure has been revised since the last audit.

The matrices will be revised as necessary, and like the Project Audit Plan, will be reviewed at least quaterly. A revision is a change to the requirements as noted; an update is the input of the documents already audited.

This system is really not as complex as it appears. If you have any questions, contact either Barry Norris or myself.

JWE/BSN
Attachments

Distribution: D.F.Bednarczyk
D.W.Bohner
T.J.Jordan
D.R.Keating
C.O.Wright
C.L.Grover
T.H.McGriff
A.C.VonNyvenheim
M.S.Monteith
S.K.Hubbard
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R.H.McDaniel
R.J.Rehkugler
W.G.Isereau

cc: H.A.Walker

MATRIX OF HOUSTON LIGHTING & POWER
MANUALS AND PROCEDURES VERSUS AUDITS

MARCH 28, 1983
REVISION 0
UPDATE NO. 0

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                               |CCD|DDD|DDD|DDD|DEG|GGG|GGG|GGG|GGG|GGG|GGH|H
                               |110|000|111|122|210|000|001|111|112|222|331|1
                               |014|689|478|901|201|234|680|236|790|129|020|1
PROJECT QUALITY ASSURANCE PLAN
SECTION  1.0                   |OOO|OOO|OOO|OOO|OOO|OOO|OOO|OOO|OOO|OOO|OOO|O
SECTION  2.0                   |OOO|OOO|OOO|OOO|OOO|OOO|OOO|OOO|OOO|OOO|OOO|O
SECTION  3.0                   |O  | O |O O| O |  O|   |   |   |  O|  O|OO |
SECTION  4.0                   |O  |OOO|OO | O |  O|   | O |OO |O O|OOO|OO |
SECTION  5.0                   |OOO|  O|OO |OOO|OOO|OOO|OOO|OOO|OOO|OOO|OOO|O
SECTION  6.0                   |OOO|  O|OOO|OOO|O O|  O|OOO|O  | OO|OOO|OO |
SECTION  7.0                   |O  |O O|OOO| O |O O|   | O |OO | OO|OOO|OO |
SECTION  8.0                   |OO |   |   |   | OO|   |   |O  |O O|OOO|OOO|O
SECTION  9.0                   | O |  O|O  |   |  O|   | O |   |  O|OOO|OO |O
SECTION 10.0                   |OO |  O|O  |   | OO| O | O |   |OOO| OO|OOO|O
SECTION 11.0                   | O |   |O  |   | OO|   | O |   |  O| OO|OOO|O
SECTION 12.0                   |OO |   |   |   | OO|   | O |   |  O| OO|OOO|O
SECTION 13.0                   |OO |   |   |   | OO| O |   | OO|O O|OOO|OOO|O
SECTION 14.0                   |O  |   |   |   |  O|   | O |   |  O|OOO|OOO|O
SECTION 15.0                   |O  |  O|OOO| OO|O O|O  |   |O  |  O|  O|OO |
SECTION 16.0                   |OO |  O|OOO| O |OOO|O  | O |   | OO|OOO|OOO|O
SECTION 17.0                   |O O|  O|OOO| OO|O O|  O| O |   | OO|OOO|OO |
SECTION 18.0                   |   |  O|   |   |  O|   | O |   |  O| OO|OO |

                               |CCD|DDD|DDD|DDD|DEG|GGG|GGG|GGG|GGG|GGG|GGH|H
                               |110|000|111|122|210|000|001|111|112|222|331|1
                               |014|689|478|901|201|234|680|236|790|129|020|1
NUCLEAR QUALITY ASSURANCE PROGRAM MANUAL
SECTION  1.0                   |   |   |   |   |   |   |   |   |   |   | O |
SECTION  2.0                   |   |   |   |   |   |   |   |   |   |   | O |
SECTION  3.0                   |   |   |   |   |   |   |   |   |   |   | O |
SECTION  4.0                   |   |   |   |   |   |   |   |   |   |   | O |
SECTION  5.0                   |   |   |   |   |   |   |   |   |   |   | O |
SECTION  6.0                   |   |   |   |   |   |   |   |   |   |   | O |
SECTION  7.0                   |   |   |   |   |   |   |   |   |   |   | O |
SECTION  8.0                   |   |   |   |   |   |   |   |   |   |   | O |
SECTION  9.0                   |   |   |   |   |   |   |   |   |   |   | O |
SECTION 10.0                   |   |   |   |   |   |   |   |   |   |   | O |
SECTION 11.0                   |   |   |   |   |   |   |   |   |   |   | O |
SECTION 12.0                   |   |   |   |   |   |   |   |   |   |   | O |
SECTION 13.0                   |   |   |   |   |   |   |   |   |   |   | O |
SECTION 14.0                   |   |   |   |   |   |   |   |   |   |   | O |
SECTION 15.0                   |   |   |   |   |   |   |   |   |   |   | O |
SECTION 16.0                   |   |   |   |   |   |   |   |   |   |   | O |
SECTION 17.0                   |   |   |   |   |   |   |   |   |   |   | O |
SECTION 18.0                   |   |   |   |   |   |   |   |   |   |   | O |
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MATRIX OF HOUSTON LIGHTING & POWER
MANUALS AND PROCEDURES VERSUS AUDITS

	CCD	DDD	DDD	DDD	DEG	GGG	GGG	GGG	GGG	GGG	GGH	H
	110	000	111	122	210	000	001	111	112	222	331	1
	014	689	478	901	201	234	680	236	790	129	020	1
PROJECT ENGINEERING PROCEDURES												
PEP 1.02				O								
PEP 1.03				O								
PEP 1.05				O								
PEP 2.01				O								
PEP 2.02				O								
PEP 3.01				O								
PEP 5.01				O								
PEP 5.03				O								
PEP 5.04				O								
PEP 5.05				O								

	CCD	DDD	DDD	DDD	DEG	GGG	GGG	GGG	GGG	GGG	GGH	H
	110	000	111	122	210	000	001	111	112	222	331	1
	014	689	478	901	201	234	680	236	790	129	020	1
PROJECT SITE PROCEDURES												
PSP 08									O			
PSP 10									O			
PSP 13									O			

	CCD	DDD	DDD	DDD	DEG	GGG	GGG	GGG	GGG	GGG	GGH	H
	110	000	111	122	210	000	001	111	112	222	331	1
	014	689	478	901	201	234	680	236	790	129	020	1
PROJECT MANAGEMENT PROCEDURES												
PMP 02				O					O			
PMP 03				O					O			
PMP 05				O					O			
PMP 06				O								

	CCD	DDD	DDD	DDD	DEG	GGG	GGG	GGG	GGG	GGG	GGH	H
	110	000	111	122	210	000	001	111	112	222	331	1
	014	689	478	901	201	234	680	236	790	129	020	1
PROJECT LICENSING PROCEDURES												
PLP 02				O								
PLP 03				O								
PLP 05				O								

MATRIX OF HOUSTON LIGHTING & POWER
MANUALS AND PROCEDURES VERSUS AUDITS

RECORDS MANAGEMENT SYSTEM PROCEDURES	CCD 110 014	DDD 000 689	DDD 111 478	DDD 122 901	DEG 210 201	GGG 000 234	GGG 001 680	GGG 111 236	GGG 112 790	GGG 222 129	GGH 331 020	H 1 1
RMSP 1.01							O					
RMSP 1.02							O					
RMSP 1.03							O					
RMSP 1.16							O					
RMSP 2.02							O					
RMSP 2.06							O					
RMSP 2.09							O					
RMSP 2.20							O					
RMSP 2.22							O					
RMSP 3.00							O					
RMSP 3.16							O					
RMSP 3.17							O					
RMSP 3.19							O					
RMSP 3.20							O					
RMSP 3.24							O					
RMSP 3.25							O					
RMSP 3.26							O					
RMSP 5.01							O					
RMSP 5.02							O					
RMSP 5.03							O					

NUCLEAR PROCUREMENT PROCEDURES	CCD 110 014	DDD 000 689	DDD 111 478	DDD 122 901	DEG 210 201	GGG 000 234	GGG 001 680	GGG 111 236	GGG 112 790	GGG 222 129	GGH 331 020	H 1 1
NPP 01					O							
NPP 02					O							
NPP 03					O							
NPP 04					O							
NPP 05					O							
NPP 06					O							
NPP 07					O							
NPP 08					O							

MATRIX OF HOUSTON LIGHTING & POWER
MANUALS AND PROCEDURES VERSUS AUDITS

SUPPORT DIVISION QUALITY ASSURANCE PROCEDURES

	CCD 110 014	DDD 000 689	DDD 111 478	DDD 122 901	DEG 210 201	GGG 000 234	GGG 001 680	GGG 111 236	GGG 112 790	GGG 222 129	GGH 331 020	H 1 1
SDQAP 1.1											O	
SDQAP 1.2											O	
SDQAP 2.1											O	
SDQAP 2.2											O	
SDQAP 2.3											O	
SDQAP 2.4											O	
SDQAP 2.5											O	
SDQAP 3.1											O	
SDQAP 4.1											O	
SDQAP 5.2											O	
SDQAP 5.3											O	
SDQAP 7.1											O	
SDQAP 7.2											O	
SDQAP 7.3											O	
SDQAP 7.4											O	
SDQAP 7.5											O	
SDQAP 7.7											O	
SDQAP 7.8											O	
SDQAP 15.1											O	
SDQAP 15.2											O	
SDQAP 16.1											O	
SDQAP 16.3											O	
SDQAP 17.1											O	
SDQAP 18.1											O	
SDQAP 18.2											O	

PROJECT PROCUREMENT PROCEDURES

	CCD 110 014	DDD 000 689	DDD 111 478	DDD 122 901	DEG 210 201	GGG 000 234	GGG 001 680	GGG 111 236	GGG 112 790	GGG 222 129	GGH 331 020	H 1 1
PPP GLOSSARY				O								
PPP 01				O								
PPP 06				O								
PPP 08				O					O			
PPP 09				O								
PPP 11				O								
PPP 12				O								
PPP 15				O								

CCD 110 014	DDD 000 689	DDD 111 478	DDD 122 901	DEG 210 201	GGG 000 234	GGG 001 680	GGG 111 236	GGG 112 790	GGG 222 129	GGH 331 020	H 1 1

PROJECT SPECIFIC QUALITY ASSURANCE PROCEDURES

All of the Project Specific Quality Assurance Procedures (PSQPs) will be audited by the Support Division QA Group.

MATRIX OF BECHTEL ENERGY CORPORATION
MANUALS AND PROCEDURES VERSUS AUDITS

MARCH 28, 1983
REVISION 0
UPDATE NO. 0

PROJECT QUALITY PROGRAM MANUAL

	C10	C11	D04	D06	D08	D09	D14	D17	D18	D19	D20	D21	D22	E10	G01	G02	G03	G04	G06	G08	G10	G12	G13	G16	G17	G19	G20	G21	G22	G29	G30	G32	H10	N11
SECTION 1	O		O	O	O	O	O	O	O	O			O		O	O	O		O			O		O						O	O			
SECTION 2	O		O	O	O	O	O	O	O	O			O		O	O	O		O			O		O						O	O			
SECTION 3	O				O		O		O						O															O	O			
SECTION 4	O			O	O	O	O	O							O							O								O	O			
SECTION 5	O		O			O	O	O		O			O		O	O	O		O			O		O						O	O			
SECTION 6	O					O	O	O	O	O			O		O				O			O								O	O			
SECTION 7	O			O		O	O	O	O				O		O							O								O	O			
SECTION 8	O														O							O								O	O			
SECTION 9						O	O								O															O	O			
SECTION 10	O					O	O								O		O													O	O			
SECTION 11							O								O															O	O			
SECTION 12	O														O															O	O			
SECTION 13	O														O		O							O						O	O			
SECTION 14	O														O															O	O			
SECTION 15	O					O	O	O	O				O		O	O						O								O	O			
SECTION 16	O					O	O	O	O				O		O	O														O	O			
SECTION 17	O		O			O	O	O	O				O		O															O	O			
SECTION 18						O									O															O	O			

ASME SECTION III QUALITY ASSURANCE MANUAL

	C10	C11	D04	D06	D08	D09	D14	D17	D18	D19	D20	D21	D22	E10	G01	G02	G03	G04	G06	G08	G10	G12	G13	G16	G17	G19	G20	G21	G22	G29	G30	G32	H10	N11
SECTION 1			O	O	O	O	O	O	O	O			O		O		O														O			
SECTION 2			O	O	O	O	O	O	O	O			O		O		O														O			
SECTION 3					O		O		O						O																O			
SECTION 4				O	O	O	O	O							O																O			
SECTION 5			O			O	O	O		O			O		O		O														O			
SECTION 6						O	O	O	O	O			O		O						O										O			
SECTION 7				O		O	O	O	O				O		O		O														O			
SECTION 8															O		O																	
SECTION 9						O	O								O																			
SECTION 10						O	O								O		O																	
SECTION 11							O								O																			
SECTION 12															O																			
SECTION 13															O		O																	
SECTION 14									O						O																			
SECTION 15						O	O	O	O				O		O																O			
SECTION 16	O		O			O	O	O	O				O		O																O			
SECTION 17			O			O	O	O	O				O		O																O			
SECTION 18						O									O																O			
SECTION 19															O																O			
APPENDIX 1															O																O			

MATRIX OF BECHTEL ENERGY CORPORATION
MANUALS AND PROCEDURES VERSUS AUDITS

WORK PLAN PROCEDURES AND QUALITY CONTROL INSTRUCTIONS

	C	C	D	D	D	D	D	D	D	D	D	D	D	E	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	H	H
	1	1	0	0	0	0	1	1	1	1	2	2	2	1	0	0	0	0	0	0	1	1	1	1	1	1	2	2	2	2	3	3	1	1
	0	1	4	6	8	9	4	7	8	9	0	1	2	0	1	2	3	4	6	8	0	2	3	6	7	9	0	1	2	9	0	2	0	1
WPP/QCI 2.0																			O															
WPP/QCI 2.1																			O															
WPP/QCI 2.2															O																			
WPP/QCI 2.3																			O															
QCI 2.4															O																			
WPP/QCI 2.5															O				O															
QCI 2.6															O																			
WPP/QCI 2.8																														O				
WPP 3.0																			O															
WPP/QCI 4.0																	O																	
WPP/QCI 5.0																O																		
WPP/QCI 5.1																O																		
WPP/QCI 5.2																O																		
WPP/QCI 5.3																O																		
WPP/QCI 5.4																O																		
WPP/QCI 5.5																O																		
WPP/QCI 5.6																O																		
WPP/QCI 6.0															O																			
WPP/QCI 7.0															O																			
QCI 8.0															O																			
WPP/QCI 9.0																						O												
WPP/QCI 10.0																						O												
WPP/QCI 11.0																														O				
WPP/QCI 12.0																								O										
WPP 12.1																								O										
WPP/QCI 12.2																								O										
WPP/QCI 12.3																								O										
WPP/QCI 12.4																								O										
WPP/QCI 13.0																								O						O				
WPP/QCI 15.0																								O										
WPP 16.0							O																											
WPP/QCI 17.0																								O										
WPP/QCI 18.0														O																				
WPP 19.0																								O										
WPP/QCI 20.0																			O															
WPP/QCI 24.0																														O				
WPP/QCI 25.0													O																					
WPP/QCI 27.0																						O												
WPP/QCI 28.0																								O										
QCI 28.1																								O										
WPP/QCI 28.2																								O										
WPP/QCI 28.3																								O										
WPP/QCI 34.0															O															O				

MATRIX OF BECHTEL ENERGY CORPORATION
MANUALS AND PROCEDURES VERSUS AUDITS

	C10	C11	D04	D06	D08	D09	D14	D17	D18	D19	D20	D21	D22	E10	G01	G02	G03	G04	G06	G08	G10	G12	G13	G16	G17	G19	G20	G21	G22	G29	G30	G32	H10	H11
PROJECT QUALITY ASSURANCE PROCEDURES																																		
PQAP 1.1															O																O			
PQAP 2.1																															O			
PQAP 2.2																															O			
PQAP 2.3																															O			
PQAP 2.4															O																			
PQAP 3.1															O																O			
PQAP 3.5									O						O	O															O			
PQAP 3.6															O																O			
PQAP 3.7															O																O			
PQAP 3.8										O					O																O			
PQAP 3.9										O					O																O			
PQAP 3.10			O							O					O																O			
PQAP 3.11										O					O																O			
PQAP 4.1															O																O			
PQAP 4.3										O					O																O			
PQAP 5.1									O						O																O			
PQAP 5.2															O																O			
PQAP 5.3																															O			
PQAP 7.1					O					O					O																			
PQAP 7.2				O						O					O							O									O			
PQAP 7.5									O						O																O			
PQAP 7.6									O						O	O																		
PQAP 7.9							O								O																			
PQAP 7.10									O						O	O															O			
PQAP 7.11									O						O																			
PQAP 7.13						O				O					O				O			O												
PQAP 7.14				O						O					O				O															
PQAP 7.15									O						O	O															O			
PQAP 7.16											O				O				O												O			
PQAP 7.17										O					O				O												O			
PQAP 7.18				O											O																O			
PQAP 8.1															O																O			
PQAP 8.2															O																O			

MATRIX OF BECHTEL ENERGY CORPORATION MANUALS AND PROCEDURES VERSUS AUDITS

	C 1 0	C 1 1	D 0 4	D 0 6	D 0 8	D 0 9	D 1 4	D 1 7	D 1 8	D 1 9	D 2 0	D 2 1	D 2 2	E 1 0	G 0 1	G 0 2	G 0 3	G 0 4	G 0 6	G 0 8	G 1 0	G 1 2	G 1 3	G 1 6	G 1 7	G 1 9	G 2 0	G 2 1	G 2 2	G 2 9	G 3 0	H 3 2	H 1 0	H 1 1
ENGINEERING DEPARTMENT PROCEDURES																																		
EDP 1.7							O			O																					O			
EDP 1.10							O			O																					O			
EDP 2.13							O																								O			
EDP 4.1					O		O																								O			
EDP 4.2					O		O			O																					O			
EDP 4.4					O		O			O																					O			
EDP 4.23					O		O																								O			
EDP 4.25					O		O																								O			
EDP 4.26					O		O																											
EDP 4.27					O		O																								O			
EDP 4.28					O		O																								O			
EDP 4.31					O		O																								O			
EDP 4.33					O		O																								O			
EDP 4.34					O		O																								O			
EDP 4.36					O		O																								O			
EDP 4.37					O		O																											
EDP 4.46					O		O			O									O												O			
EDP 4.47					O		O			O									O												O			
EDP 4.49					O		O			O																					O			
EDP 4.50					O		O			O																					O			
EDP 4.52					O		O			O																					O			
EDP 4.55				O	O		O			O																					O			
EDP 4.58				O	O	O	O																								O			
EDP 4.60					O		O		O							O															O			
EDP 4.61					O		O		O							O															O			
EDP 4.62					O		O		O	O																					O			
EDP 4.63					O		O		O																						O			
EDP 4.64				O			O		O																						O			
EDP 4.65					O		O		O																						O			
EDP 5.1							O			O																					O			
EDP 5.10							O			O																								
EDP 5.13							O			O																					O			
EDP 5.15							O			O																								
EDP 5.16							O			O																					O			
EDP 5.25							O			O																					O			
EDP 5.31			O																												O			
EDP 5.32			O				O																								O			
EDP 5.34			O				O																								O			
EDP 6.5				O			O																											
EDP 6.10				O			O																								O			

MATRIX OF BECHTEL ENERGY CORPORATION
MANUALS AND PROCEDURES VERSUS AUDITS

PROJECT PROCUREMENT PROCEDURES

	C	C	D	D	D	D	D	D	D	D	D	D	D	E	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	M	M
	1	1	0	0	0	0	1	1	1	1	2	2	2	1	0	0	0	0	0	0	1	1	1	1	1	1	1	2	2	2	3	3	1	1
	0	1	4	6	8	9	4	7	8	9	0	1	2	0	1	2	3	4	6	8	0	2	3	6	7	9	0	1	2	9	0	2	0	1
PPP 1.2								O														O									O			
PPP 2.0				O				O																							O			
PPP 2.1				O				O																							O			
PPP 3.0				O				O																							O			
PPP 3.1				O				O																							O			
PPP 3.2				O				O																							O			
PPP 3.4				O				O																							O			
PPP 3.5				O				O																							O			
PPP 3.6				O				O																							O			
PPP 3.8				O				O																							O			
PPP 4.0				O				O																							O			
PPP 4.1				O				O																							O			
PPP 4.2				O				O																							O			
PPP 4.3				O				O																							O			
PPP 6.0						O																									O			
PPP 6.1						O																									O			
PPP 8.0																						O									O			

PROCUREMENT SUPPLIER QUALITY PROCEDURES

	C	C	D	D	D	D	D	D	D	D	D	D	D	E	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	M	M
	1	1	0	0	0	0	1	1	1	1	2	2	2	1	0	0	0	0	0	0	1	1	1	1	1	1	1	2	2	2	3	3	1	1
	0	1	4	6	8	9	4	7	8	9	0	1	2	0	1	2	3	4	6	8	0	2	3	6	7	9	0	1	2	9	0	2	0	1
PSQP 1.1						O																									O			
PSQP 1.2				O		O			O																						O			
PSQP 1.3						O																									O			
PSQP 1.4			O	O																											O			
PSQP 1.5			O																															
PSQP 2.1				O																											O			
PSQP 2.2				O																											O			
PSQP 2.3				O					O																						O			
PSQP 2.4				O																											O			
PSQP 2.5				O																											O			
PSQP 3.1				O		O																												
PSQP 3.2						O			O																									
PSQP 3.3						O			O																									

MATRIX OF BECHTEL ENERGY CORPORATION
MANUALS AND PROCEDURES VERSUS AUDITS

GENERAL PROJECT REQUIREMENTS

	CCD 110 014	DDD 000 689	DDD 111 478	DDD 122 901	DEG 210 201	GGG 000 234	GGG 001 680	GGG 111 236	GGG 112 790	GGG 222 129	GGM 331 020	M 1 1
GPR 2.1				O	O							
GPR 2.2				O	O							
GPR 2.4				O	O							
GPR 2.7				O			O					
GPR 2.8			O			O						
GPR 2.11			O	O	O							
GPR 2.18					O							
GPR 2.19			O O		O	O						
GPR 2.20			O O		O	O						
GPR 2.22					O							
GPR 2.24		O	O	O	O							
GPR 2.25		O										
GPR 3.2					O							
GPR 3.3	O				O							

RECORDS MANAGEMENT SYSTEMS PROCEDURES

	CCD 110 014	DDD 000 689	DDD 111 478	DDD 122 901	DEG 210 201	GGG 000 234	GGG 001 680	GGG 111 236	GGG 112 790	GGG 222 129	GGM 331 020	M 1 1
RMSP 1.02	O				O							
RMSP 1.16	O				O							
RMSP 2.02	O		O	O	O							
RMSP 2.03	O			O	O							
RMSP 2.06					O							
RMSP 2.05	O			O	O							
RMSP 2.08	O			O	O							
RMSP 2.09					O							
RMSP 2.13	O			O	O							
RMSP 2.16	O				O							
RMSP 2.20	O			O	O							
RMSP 2.22	O				O							

MATRIX OF EBASCO SERVICES, INC.
MANUALS AND PROCEDURES VERSUS AUDITS

MARCH 28, 1983
REVISION 0
UPDATE NO. 0

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                        |CCD|DDD|DDD|DDD|DEG|GGG|GGG|GGG|GGG|GGG|GGH|H
                        |110|000|111|122|210|000|001|111|112|222|331|1
                        |014|689|478|901|201|234|680|236|790|129|020|1
NUCLEAR QUALITY ASSURANCE MANUAL [ETR 1001]
QA-I-1                  | O |   |   |   | O |   | OO| O |O  |OO |  O|O
QA-I-2                  | O |   |   |   | O |   | OO| O |O  |OO |  O|O
QA-I-3                  | O |   |   |   | O |   | OO| O |O  |OO |  O|O
QA-I-5                  |   |   |   |   |   |   | O | O |   |OO |   |
QA-I-6                  |   |   |   |   |   |   | O |   |   |OO |   |
QA-III-1                | O |   |   |   | O |   | OO| O |O  |OO |  O|O
QA-III-2                | O |   |   |   |   |   | OO|   |   |OO |   |
QA-III-3                |   |   |   |   |   |   | O | O |O  |OO |   |
QA-III-4                | O |   |   |   |   |   |   | O |   |OO |   |
QA-III-5                |   |   |   |   | O |   |   | O |   | O |   |
QA-III-6                | O |   |   |   | O |   | O | O |   |OO |  O|O
QA-III-7                | O |   |   |   | O |   | O |   |   |OO |  O|O
QA-III-8                | O |   |   |   |   |   | O |   |   |OO |   |O
QA-III-9                |   |   |   |   |   |   | O |   |   | O |   |
QA-III-10               | O |   |   |   | O |   |   |   |O  |OO |  O|O
QA-III-11               | O |   |   |   | O |   | O |   |O  | O |  O|O
QA-III-12               | O |   |   |   | O |   | O |   |   | O |  O|O
QA-III-13               | O |   |   |   | O |   | O |   |   | O |  O|O
QA-III-14               | O |   |   |   | O |   |   | O |O  |OO |  O|O
QA-III-15               |   |   |   |   |   |   | O |   |   |OO |  O|O
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MATRIX OF EBASCO SERVICES, INC.
MANUALS AND PROCEDURES VERSUS AUDITS

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                                   |CCD|DDD|DDD|DDD|DEG|GGG|GGG|GGG|GGG|GGG|GGH|M
                                   |110|000|111|122|210|000|001|111|112|222|331|1
                                   |014|689|478|901|201|234|600|236|790|129|020|1
ASME SECTION III QUALITY ASSURANCE MANUAL
I-1                                |   |   |   |   |   |   |   |  O|   |OO |   |
I-2                                |   |   |   |   |   |   |   |  O|   |OO |   |
I-3                                |   |   |   |   |   |   |   |   |   |OO |   |
I-4                                |   |   |   |   |   |   |   |   |   | O |   |
I-5                                |   |   |   |   |   |   |   |   |   | O |   |
I-6                                |   |   |   |   |   |   |   |   |   | ( |   |
I-7                                |   |   |   |   |   |   |   |  O|   |OO |   |
I-8                                |   |   |   |   |   |   |   |   |   | O |   |
I-9                                |   |   |   |   |   |   |   |   |   | O |   |
I-10                               |   |   |   |   |   |   |   |   |   |O  |   |
II-1                               |   |   |   |   |   |   |   |   |   | O |   |
II-2                               |   |   |   |   |   |   |   |   |   |OO |   |
II-3                               |   |   |   |   |   |   |   |   |   |OO |   |
II-4                               |   |   |   |   |   |   |   |   |   |O  |   |
II-5                               |   |   |   |   |   |   |   |   |   | O |   |O
III-1                              |   |   |   |   |   |   |   |  O|   | O |   |
III-2                              |   |   |   |   |   |   |   |   |   |OO |   |
III-3                              |   |   |   |   |   |   |   |   |   |OO |   |
III-4                              |   |   |   |   |   |   |   |   |   |OO |   |
III-5                              |   |   |   |   |   |   |   |   |   | O |   |O
III-6                              |   |   |   |   |   |   |   |   |O  |OO |  O|
III-7                              |   |   |   |   |   |   |   |   |O  | O |  O|
III-8                              |   |   |   |   |   |   |   |   |   | O |  O|O
III-9                              |   |   |   |   |   |   |   |   |   | O |  O|O
III-10                             |   |   |   |   |   |   |   |   |O  |OO |   |
III-11                             |   |   |   |   |   |   |   |   |   |OO |  O|
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MATRIX OF EBASCO SERVICES, INC.
MANUALS AND PROCEDURES VERSUS AUDITS

QUALITY CONTROL PROCEDURES	CCD 110 014	DDD 000 689	DDD 111 478	DDD 122 901	DEG 210 201	GGG 000 234	GGG 001 680	GGG 111 236	GGG 112 790	GGG 222 129	GGH 331 020	N 1 1
QCP-1.1							O					
QCP-2.1	O				O		O				O	O
QCP-2.2	O											
QCP-6.1							O					
QCP-6.2							O					
QCP-6.3							O					
QCP-9.1												O
QCP-9.2												O
QCP-9.3												O
QCP-9.4												O
QCP-9.5												O
QCP-10.1	O											
QCP-10.2	O											
QCP-10.3	O											
QCP-10.4	O											
QCP-10.5	O											
QCP-10.6												O
QCP-10.7	O											
QCP-10.8	O											
QCP-10.9	O				O							
QCP-10.10	O											
QCP-10.11											O	
QCP-10.12											O	
QCP-10.13											O	
QCP-10.14											O	
QCP-10.15					O							
QCP-10.16	O				O							
QCP-10.17					O							
QCP-10.18					O							
QCP-10.20					O							
QCP-10.21											O	
QCP-10.22							O				O	
QCP-10.23	O											
QCP-10.24	O											
QCP-10.25	O											
QCP-11.1											O	
QCP-12.1							O					
QCP-13.1									O			
QCP-13.2	O				O		O				O	
QCP-13.3									O			
QCP-14.1	O				O		O				O	O
QCP-15.1							O					
QCP-15.2							O					
QCP-15.3							O					
QCP-16.1							O					
QCP-17.1							O					

MATRIX OF EBASCO SERVICES, INC.
MANUALS AND PROCEDURES VERSUS AUDITS

QUALITY ASSURANCE PROCEDURES	CCD 110 014	DDD 000 689	DDD 111 478	DDD 122 901	DEG 210 201	GGG 000 234	GGG 001 680	GGG 111 236	GGG 112 790	GGG 222 129	GGM 331 020	M 1 1
QA-G.1							O			O		
QA-G.2							O			O		
QA-G.3							O			O		
QA-G.3.1	O				O					O	O	O
QA-G.4							O			O		
QA-D.3							O			O		
QA-D.4							O			O		
QA-D.5.2							O			O		

SITE QUALITY ASSURANCE PROCEDURES	CCD 110 014	DDD 000 689	DDD 111 478	DDD 122 901	DEG 210 201	GGG 000 234	GGG 001 680	GGG 111 236	GGG 112 790	GGG 222 129	GGM 331 020	M 1 1
QAS-1							O					
QAS-2							O					
QAS-3							O					
QAS-4							O					
QAS-5							O					
QAS-6							O					
QAS-8							O					
QAS-9							O					
QAS-11							O					
QAS-12							O					
QAS-13							O					
QAS-14							O					
QAS-15							O					
QAS-16							O					
QAS-17							O					
QAS-18							O					
QAS-19							O					
QAS-20							O					
QAS-21							O					
QAS-22							O					
QAS-23							O					

MATRIX OF EBASCO SERVICES, INC.
MANUALS AND PROCEDURES VERSUS AUDITS

SITE QUALITY ASSURANCE INSTRUCTIONS	CCD 110 014	DDD 000 689	DDD 111 478	DDD 122 901	DEG 210 201	GGG 000 234	GGG 001 680	GGG 111 236	GGG 112 790	GGG 222 129	GGH 331 020	M 1 1
QAI-001							O					
QAI-002							O					
QAI-003							O					
QAI-004							O					
QAI-005							O					
QAI-006							O					
QAI-007							O					
QAI-008							O					
QAI-009								O				
QAI-010							O					
QAI-011							O					
QAI-012							O					
QAI-013							O					
QAI-014												O
QAI-015												O
QAI-016							O					
QAI-017							O					
QAI-019							O					

MATRIX OF EBASCO SERVICES, INC.
MANUALS AND PROCEDURES VERSUS AUDITS

	CCD	DDD	DDD	DDD	DEG	GGG	GGG	GGG	GGG	GGG	GGH	H
	110	000	111	122	210	000	001	111	112	222	331	1
	014	689	478	901	201	234	680	236	790	129	020	1
ADMINISTRATIVE SITE PROCEDURES												
ASP-1										O		
ASP-2							O			O		
ASP-3								O		O		
ASP-4					O					O	O	
ASP-5							O		O	O		
ASP-6							O	O				
ASP-8										O		
ASP-11							O			O		
ASP-12										O		
ASP-14										O		
ASP-15										O		
ASP-16							O			O		
ASP-19							O	O		O		
ASP-20								O		O		
ASP-32							O		O	O		
ASP-33							O			O		
ASP-34							O			O		
ASP-82										O		

	CCD	DDD	DDD	DDD	DEG	GGG	GGG	GGG	GGG	GGG	GGH	H
	110	000	111	122	210	000	001	111	112	222	331	1
	014	689	478	901	201	234	680	236	790	129	020	1
CONSTRUCTION MANAGEMENT INSTRUCTIONS												
CMI-1									O			

	CCD	DDD	DDD	DDD	DEG	GGG	GGG	GGG	GGG	GGG	GGH	H
	110	000	111	122	210	000	001	111	112	222	331	1
	014	689	478	901	201	234	680	236	790	129	020	1
NONDESTRUCTIVE EXAMINATION PROCEDURES												
NDE-002-1												O
NDE-002-2												O
NDE-005-1												O
NDE-006-1												O
NDE-007-1												O

MATRIX OF EBASCO SERVICES, INC.
MANUALS AND PROCEDURES VERSUS AUDITS

	CCD 110 014	DDD 008 689	DDD 111 478	DDD 122 901	DEG 210 201	GGG 000 234	GGG 001 680	GGG 111 236	GGG 112 790	GGG 222 129	GGH 331 020	H 1 1
CONSTRUCTION SITE PROCEDURES												
CSP-1	O											
CSP-2					O						O	
CSP-3										O	O	
CSP-4	O											
CSP-7											O	
CSP-9											O	
CSP-10	O											
CSP-11	O											
CSP-12	O								O	O		
CSP-13	O											
CSP-14	O									O		
CSP-16											O	
CSP-17											O	O
CSP-18	O											
CSP-20	O											
CSP-22	O										O	
CSP-25										O	O	
CSP-30	O											
CSP-31											O	
CSP-32					O							
CSP-34	O											
CSP-35	O											
CSP-37										O	O	
CSP-40					O							
CSP-41	O											
CSP-43					O							
CSP-49										O	O	
CSP-54	O										O	
CSP-55	O											
CSP-56	O											
CSP-81												O
CSP-82												O
CSP-83												O
CSP-84												O
CSP-86												O
CSP-87												O
CSP-88												O
CSP-89												O
CSP-90												O
CSP-91												O
CSP-92												O
CSP-94												O

MEETING NOTES
FILE NO: 01.13

DATE OF MEETING: April 7, 1983

LOCATION: BEC Conference Room B

ATTENDEES:
L. W. Hurst, BEC PQAM
R. W. Miller, BEC PQAE Rm
R. A. Meggison, BEC PQCE
D. T. Krisha, BEC QAM
C. L. Hawn, ESI QA
R. A. Cummings, ESI QA
D. R. Keating, HL&P QA
F. E. Williamson, ESI QC

DISTRIBUTION:
B. L. Lex
B. R. McCullough
R. L. Rogers
G. R. Alsop
K. R. Dotterer
B. R. Mazo
D. T. Krisha
J. E. Geiger
H. A. Walker

SUBJECT: Weekly QA Manager's Meeting

ITEM	DESCRIPTION OF DISCUSSION	ACTION
1	DISPOSITION AND CLOSEOUT OF NCR SM-9763 (DM-0122)	

F. E. Williamson reported that ESI QC has looked at all the equipment listed on the NCR. For this equipment, inspection documentation has not been generated due to the status of construction (i.e. construction not far enough along to have inspection performed) or B&R documentation has been located and is presently being used to disposition applicable sections of this NCR and other related NCR's.

ACTION

Inspection complete — sent to for Engineering disposition

• Provide schedule of QC inspections and vendor manuals required.	R. G. Grippardi Due 4/14/83
• Locate copies of vendor manuals as requested by ESI QC.	R. A. Meggison Due as required
• Provide Engineering Status of vendor manuals.	M. L. Lawson Due 4/14/83
• Contact Bill Hill (NRC) and bring him up to date on current status of NCR. check	D. R. Keating Due 4/14/83

MEETING NOTES
FILE NO: 01.13

2 REMOVAL OF ACCEPTED ITEMS

L. W. Hurst requested information on the method used by ESI to reinspect items which were previously installed and accepted and later removed.

C. L. Hawn stated that ESI has prepared a "take down" procedure that will be issued for review and comment the week of 4/11/83.

ACTION

- Provide status of the procedure. — C. L. Hawn, Due 4/14/83

Returned to ESI QC with comments.

3 PROJECT NCR PROCEDURE

R. A. Meggison stated an attachment to each company's procedure to describe details of NCR processing within ESI, HL&P, and BEC will be transmitted to HL&P and ESI during the week of 4/11/83.

ACTION

- Provide update weekly. — R. A. Meggison, Due 4/14/83

Sent out 4-12-83. Comments from Ebasco in two weeks. To Bechtel 4-26-83.

4 PURGE OF RECORDS FOR ITEMS SCRAPPED UNDER BEC JURISDICTION

R. A. Meggison stated that a follow up meeting was held on March 28, 1983. Purpose of the meeting was to establish philosophy regarding correction of site quality records and how it will be accomplished. No agreement was reached.

ACTION

- Elevate concerns to appropriate management levels. — R. A. Meggison, Due 4/14/83

Problem to be elevated.

MEETING NOTES
FILE NO: 01.13

5 REJECTED STRUCTURAL STEEL PLATE

R. A. Meggison inspected the plate and determined that Fabrication Shop had rejected the Code Class Plate. He is awaiting BEC Field Engineering establishment of acceptance criteria to be issued.

It was suggested that this be added to the Critical Items List.

ACTION

- Establish completion forecast with Field Engineering. — R. A. Meggison, Due 4/14/83

6 WESTINGHOUSE CONTINGENCY ITEMS

H. A. Walker and L. W. Hurst requested that Westinghouse provide its computerized contingency list. (This list identifies supplier documentation that is lacking at the time of shipment.)

H. A. Walker, L. W. Hurst, and R. A. Meggison expressed their lack of confidence in the contingency list.

R. A. Meggison reported that the contingency list has been received.

L. W. Hurst requested a letter from HL&P detailing the scope of this investigation.

ACTION

- Review documentation in the vault relative to Westinghouse Quality Releases to assure contingencies have been closed. — R. A. Meggison, Due 4/14/83
- Provide letter. — H. A. Walker, Due 4/14/83

MEETING NOTES
FILE NO: Q1.13

7 EBASCO REJECT RATES

L. W. Hurst stated a letter to Ebasco requested that they establish a program to report reject rates. A response from ESI was due 12/17/82.

L. W. Hurst suggested in the 3/3/83 meeting, that the program be established in a desk instruction.

C. L. Hawn stated that the desk instruction is undergoing in-house review and is scheduled to be issued by 4/15/83.

ACTION

- Issue desk instruction for implementing the reject rate program. — C. L. Hawn, Due 4/15/83

Will be issued 4-15-83.

8 CONFIGURATION CONTROL

R. P. Grippardi expressed a concern regarding drawing changes made after installation CIP's have been signed off.

C. L. Hawn stated a procedure will be issued by ESI Resident Engineering to address this concern by May 1, 1983.

C. L. Hawn reported that ESI plans to utilize their Cost and Scheduling system to control this activity. L. W. Hurst expressed his concern that cost and scheduling would be making quality decisions.

ACTION

- ESI to issue procedure. C. L. Hawn to provide status. — C. L. Hawn, Due 4/14/83

9 DOCUMENTATION STORAGE

C. L. Hawn requested clarification on duplicate storage requirements of PTL and Champion documents.

ACTION

- Issue letter clarifying duplicate storage of original contractor documents. — R. W. Miller, Due 4/14/83

MEETING NOTES
FILE NO: 01.13

10 ESI's PLAN TO NOT USE ASME NPP-1 FORM

R. A. Meggison expressed his concern that ESI is not planning to use the NPP-1 form. This results in an extensive review effort late in the job and a large, unwieldy N-5 data package.

ACTION

- Determine if "The letter of transmittal" that ESI is planning to use serves the same purpose of the NPP-1 form. — R. P. Grippardi, Due 4/7/83

11 NCR's ISSUED DURING MAINTENANCE ACTIVITIES

R. P. Grippardi requested assistance in establishing guidelines to limit the number of NCR's written during maintenance activities. The practice has been to generate Deficiency Notices, however, this system does not involve Engineering. Because an engineering evaluation is needed, NCR's are now being written for such items as heater strips not being energized for 3 weeks, etc.

ACTION

- Coordinate with Field Engineering to establish maintenance guidelines (criteria) that would allow Deficiency Notices to be used to track minor inadequacies. Provide status. — R. A. Meggison, Due 4/7/83

12 ANI PIPING TO WALKDOWN PRIOR TO BACKFILL

L. W. Hurst stated that the ECW lines are being buried. He asked if ESI plans to walkdown the system with the ANI prior to burial.

C. L. Hawn stated a letter from the ESI ANI confirms that the ANI does the walkdown during the hydrotest and does not want to look at it again.

This item is closed.

MEETING NOTES
FILE NO: Q1.13

13 PROJECT TREND PROGRAM

L. W. Hurst requested a meeting with ESI and HL&P to review the overall trend program. The meeting is scheduled for April 8, 1983, at 1:00 p.m.
Meeting held yesterday & milestones were developed. Item can be closed.

14 FIT UP OF AUXILIARY STEEL

R. P. Grippardi stated that there is presently a controversy as to whether ANSI N45.2 requirements for fit up of structural steel apply to auxiliary steel (unistrut and globe strut).

It was reported that an FCR is in process.

ACTION

- Coordinate with Project Field Engineering to clarify the scope of ANSI N45.2.5. — C. L. Hawn, Due 4/14/83

Responsibility changed to L. Hurst.

15 TIMELINESS OF REVIEW OF PCR's AND ICP's

R. P. Grippardi stated that BEC is not providing an expeditious review of ESI's procedure changes (PCR's and ICP's). This condition is creating problems in areas where ESI has committed to implement a change as a result of a BEC or an HL&P CAR.

ACTION

- BEC-QA to perform a surveillance and report results. — R. W. Miller, Due 4/14/83

MEETING NOTES
FILE NO: 01.13

NEW ITEMS

1 QADP SUBMITTAL
(4/7/83)

D. R. Keating reported the QADP submittal is being prepared. When submitted to NRC, HL&P will issue a letter to BEC requesting implementation of the new revision.

2 RECEIVING INSPECTION OF ITEMS FURNISHED BY THE INTERMECH FAB SHOP
(4/7/83)

C. L. Hawn requested information on which organization is responsible for performing receipt inspection of these items. L. W. Hurst and R. A. Meggison stated the material is fabricated under Intermech's approved QA Program and therefore, only acceptable items be placed in the storage yard that ESI draws from.

3 PTL TESTING PROGRAM
(4/7/83)

C. L. Hawn reported ESI's feeling on the PTL-ESI interface for concrete testing. ESI feels PTL should be responsible for directing and taking the samples required at the end of the slick line.

ACTION

- Followup with BEC Contracts group. — R. W. Miller, Due 4/21/83

4 COMPARISON OF ESI XRAY's TO B&R XRAY's
(4/7/83)

R. A. Meggison reported that ESI is re-shooting items where B&R Xrays are already in vault. In some cases, the new ESI Xray may not show a possible defect that may have appeared in the B&R Film. He requested ESI investigate and document resolution of situations.

ACTION

- Determine solution. *No problem.* — F. E. Williamson, Due 4/28/83

Complete.

0057H/0001H

Houston Lighting & Power Company

OFFICE MEMORANDUM April 13, 1983

To D. G. Barker

ST-HS-HL-02774
File No.: Q17.1
G4

From H. A. Walker DRKeating

Subject South Texas Project Electric Generating Station
NRC Entrance Meeting of April 11, 1983
Special Study of Nuclear Quality Assurance

ATTENDEES:

HL&P	BEC	ESI	USNRC
H. A. Walker	B. R. McCullough	C. L. Hawn	E. Bradford
D. R. Keating	R. W. Miller	J. A. Thompson	W. G. Hubacek
J. L. Barker	H. R. Reuter	J. Crnich	W. M. Hill
E. L. Avery			E. W. Brach
I. P. Morrow			[redacted]
			M. Patrick

Mr. Altman provided a brief background relative to his team's purpose and that they were interested in how previous problems at the site had been corrected and how the present program is now working. It was indicated that they would be discussing these items with personnel at the site. It is expected that the NRC group will be here all week.

If you have any questions or comments, please call me.

HAW/DRK:lb

cc: G. W. Oprea, Jr.
J. E. Geiger
R. L. Ulrey
J. W. Williams
S. M. Dew
D. M. Walquist
QA Supervisors
Attendees
STP/RMS-CCS
Site Library

MEETING SUBJECT: NRC Ford Amendment Mting

MEETING DATE: April 15, 1983

MEETING ATTENDEES:

NAME	COMPANY/ORGANIZATION	TITLE
D.F. Bednarczyk	HL&P /QA	Proj QA Supr.
J.E. Geiger	"	Manager, QA
[illegible]	[illegible]	VICE PRESIDENT
L.D Kubicek	EG&G Idaho/QA	Branch Mgr - stds & Systems
J.A. CHRISTENSEN	BATTELLE-NORTHWEST	SR. ENG.
A.E. BRADFORD	EG&G IDAHO/QA	QUALITY LOFT SUPERVISOR (ENG)
[illegible] BRACH	USNRC, IE	Sr QA Eng.
M.G. PATRICK	BATTELLE EPRID	STAFF ENGR
H. HARTY	Battelle NW	SR. STAFF ENGR.
D.G. Barker	HL&P/ ~~PAA~~	PM
G.W. OPREA Jr	HL&PCo	EXEC. V.P.
J.L Barker	HL&P	Supv Proj. Eng
J.H. Goldberg	HL&P	V.P. Nuc. Eng. & Const
H.A. Walker	HL&P/ QA	Project QA Manager
J.W. Williams	HL&P	Site Mgr.
~~JE GEIGER~~	~~HL&P~~	~~CORPORATE QA MANAGER~~
[illegible]. HILL	NRC	SRI
W. CROSSMAN	NRC	CHIEF PSB

29,000, Orange Field 2,000, Panorama 1,684, Patton Village 1,537, Pine Forest 3,300, Pinehurst 2,700, Port Arthur 66,121, Porter 10,203, Port Neches 15,858 Saratoga 1,302, Shenandoah 1,701, Shepherd 1,378, Silsbee 18,200, Somerville 1,860, Sour Lake 3,062, Stowell 1,810, Trinity 3,085, Vidor 20,287, Warren 1,836, West Orange 5,000, Willis 2,391, Winnie 3,810, Woodbranch 1,134, Woodlands 8,165, Woodville 6,808

LOUISIANA

Addis 3,248, Angola 3,632, Arnaudville 1,673, Baker 14,480, Baton Rouge 297,126, Brittany 1,025, Broussard 1,770, Brownsfield 11,957, Brusly 3,704, Carencro 2,302, Carlyss 2,300, Carville 1,280, Central 8,609, Chamberlin 1,184, Church Point 3,986, Clinton 2,802, Crescent 2,144, Delcambre 1,929, Denham Springs 14,502, Duplessis 2,025, Dutchtown 3,100, Duson 1,115, Elton 1,595, Erwinville 2,072, French Settlement 1,256, Galvez 2,000, Gonzales 17,600, Grand Coteau 1,301, Greenwell Springs 2,824, Hackberry 1,500, Hayes 1,500, Henderson 1,700, Iota 1,300, Iowa 2,100, Jackson 8,810, Jarreau 2,108, Jennings 11,793, Lake Arthur 3,551, Lake Charles 96,000, Lakeland 1,020, Livingston 3,140, Lobdell 3,000, Maringouin 3,135, Millerville 7,760, Mix 1,200, Morganza 1,500, Oak Grove 3,625, Oscar 1,120, Port Allen 10,850, Port Barre 2,133, Prairieville 1,500, St Amant 1,200, St Francisville 2,920, St Gabriel 1,575, Scotlandville 18,611, Scott 1,334, Sorrento 1,800, Starks 2,000, Sulphur 22,600, Sunset 1,675, Sunshine 1,220, Toomey 1,800, Ventress 2,365, Walker 5,004, Westlake 6,500, Youngsville 1,010, Zachary 7,798

HOUSTON LIGHTING AND POWER CO
P.O. Box 1700, Houston, Tex 77001
Tel: 228-9211, Area Code: 713

Pres & Ch Exec Officer .... D D Jordan
Exec VP .... G W Oprea Jr
Exec VP .... H R Dean
Exec VP .... D D Sykora
Group VP, Adm .... J D Cowart
Group VP .... K R Hinckley
Group VP, Sys Eng & Opr .... D E Simmons
Group VP, Fossil Plt Eng & Constr .... E A Turner
VP, Pwr Sys Dev .... R M Mc Cuistion
VP .... C L McNeese
VP, Pwr Supply .... R L Evans Jr
VP, Pur & Svc .... A R Beavers
Sec & Treas .... J R Johnston
Compt .... R S Letbetter

Galveston Dist
Dist Mgr .... D G Gartman

Brazosport Dist
Dist Mgr .... J W Taylor

Baytown Dist/Channelview Dist
Dist Mgr .... J F Schaefer

Humble Dist
Dist Mgr .... K S McDonald

Bayshore Dist
Dist Mgr .... J L Wyatt

Pasadena Dist
Dist Mgr .... A C Czigan

Ft Bend Dist
Dist Mgr .... F Davenport

Sealy Dist
Dist Mgr .... R C Fiedler

Wharton Dist
Dist Mgr .... J M Billings

Brazoria Dist
Dist Mgr .... E G Grisham

Tomball Dist
Dist Mgr .... J B Fuerst

Bellaire Dist *
Dist Mgr .... J A Lopez

Mag Park Undr Dist
Dist Mgr .... L Gardner

Berry Dist
Dist Mgr .... L Gardner

Hiram Clarke Dist
Dist Mgr .... Martha Medina

Greenspoint Dist
Dist Mgr .... W L Ullrich

Spring Br-Katy Dist
Dist Mgr .... R E White

Elec Cust: Res 909,016 Com 124,298 Indl 1,633 Others 76 Total 1,035,023
Elec Res Cust Avg Rate 05.0¢/kwhr, Use 14,219 kwhr
Tot No/Employees (Full Time,Year End) 8,768

MAJOR INTERCONNECTIONS

Utility	Max Tie Kva	Tie Voltages
Lwr Colo Riv Auth	200,000	138 kv
Texas P&L Co	1,200,000	345 kv
Central P&L Co	600,000	69,138 & 345 kv

1980 Net Sys Input 57,228,126,000 kwhr
1980 Power Purchased 720,293,000 kwhr
1980 Sales/Elec 54,803,619,214 kwhr
No/Transm Substa 26, Tot kva 28,680,859
No/Distr Substa 160, Tot kva 16,538,375
Transm Volt 138 kv & 345 kv, Pole Miles 1,833
Transm Volt 69 kv, Pole Miles 506
Distr Prim Volt 34.5, 12.47, 7.2, 4.16, 2.4, St Ltg & Sec kv Pole Miles 17,596
Underground Cable Miles Transm 12.6, Prim & Secondary Distr 1,789, St. Ltg 1,515
Tot Gen Cap as of Jan 1, 1981 11,607,502 kw
Sys Peak (Summer) 10,535,000 kw, (Winter) 7,357,000 kw

DEEPWATER, Houston Tex
Plant Supt .... G L Stanina
Net Sta Gen (1980) .... 573,496,000 kwhr
Steam Turbine Gen Cap .... 305,125 kw
Natural Gas
Unit 1 - 20,000 kw | Unit 5 - 12,000 kw
Unit 2 - 20,000 kw | Unit 6 - 35,000 kw
Unit 3 - 25,000 kw | Unit 7 - 156,250 kw
Unit 4 - 35,000 kw | Unit 8 - 1,875 kw

GABLE STREET, Houston Tex
Plant Supt .... C L Lloyd
Net Sta Gen (1980) .... (2,335,000) kwhr
Steam Turbine Gen Cap .... 53,000 kw
Natural Gas
Unit 6 - 20,000 kw | Unit 7 - 33,000 kw

DEEPWATER CHAMPION, Houston, Tex
Net Sta Gen (1980) .... 192,907,000 kwhr
Steam Turbine Gen Cap .... 19,000 kw
Natural Gas
Unit 1 - 5,000 kw | Unit 3 - 10,000 kw
Unit 2 - 4,000 kw

HIRAM O CLARKE, Houston, Texas
Plant Supt .... C L Lloyd
Net Sta Gen (1980) .... 251,720,000 kwhr
Steam Turbine Gen Cap .... 210,000 kw
Gas Turbine Gen Cap .... 81,000 kw
Natural Gas
Units 1-2 - 30,000 kw ea | Units 3-4 - 75,000 kw ea
Gas Turbine
Units 1-6 - 13,500 kw ea

GREENS BAYOU, Houston, Texas
Plant Supt .... A G Wortham
Net Sta Gen (1980) .... 2,604,372,000 kwhr
Steam Turbine Gen Cap .... 740,710 kw
Gas Turbine Gen Cap .... 362,340 kw
Natural Gas
Units 1-2 - 66,000 kw ea | Units 3-4 - 100,000 kw ea
Unit 5 - 408,710 kw
Gas Turbine
6 Units - 60,390 kw ea

CEDAR BAYOU, Baytown, Tex
Plant Supt .... M C Morris
Net Sta Gen (1980) .... 13,073,113,000 kwhr
Steam Turbine Gen Cap .... 2,093,800 kw
Natural Gas
Unit 1 - 692,737 kw | Unit 2 - 698,112 kw*
Unit 3 - 702,951 kw

WEBSTER, Webster, Tex
Plant Supt .... H Weiss
Net Sta Gen (1980) .... 2,185,460,000 kwhr
Steam Turbine Gen Cap .... 550,000 kw
Gas Turbine Gen Cap .... 14,500 kw (1 Unit)
Natural Gas
Units 1-2 - 100,000 kw ea | Unit 3 - 350,000 kw

SAM BERTRON, Houston, Tex
Plant Supt .... D A Buell
Net Sta Gen (1980) .... 3,425,751,000 kwhr
Steam Turbine Gen Cap .... 750,500 kw
Gas Turbine Gen Cap .... 41,500 kw
Natural Gas
Units 1-2 - 156,250 kw ea | Units 3-4 - 219,000 kw ea
Gas Turbine
Unit 1 - 27,000 kw | Unit 2 - 14,500 kw

T H WHARTON, Houston, Tex
Plant Supt .... T E Gish
Net Sta Gen (1980) .... 5,510,253,000 kwhr
Steam Turbine Gen Cap .... 505,964 kw
Gas Turbine Gen Cap .... 731,200 kw
Natural Gas
Unit 1 - 66,000 kw | Unit 2 - 220,000 kw
Unit 3 - 109,982 kw | Unit 4 - 109,982 kw
Gas Turbine
Unit G1 - 14,500 kw | Units 41-42 - 46,100 kw ea
Unit 31 - 46,100 kw | Units 43-44 - 50,400 kw ea
Units 32-34 - 45,200 kw ea | Units 51-56 - 57,000 kw ea

W A PARISH, Richmond, Tex
Plant Supt .... J H McConnell
Net Sta Gen (1980) .... 16,218,253,000 kwhr
Steam Turbine Gen Cap .... 2,942,169 kw
Gas Turbine Gen Cap .... 14,500 kw (1 Unit)
Natural Gas
Units 1-2 - 156,250 kw ea | Units 5-6 - 636,061 kw ea
Unit 3 - 275,000 kw | Unit 7 - 551,149 kw
Unit 4 - 531,398 kw

P H ROBINSON, Bacliff, Tex
Plant Supt .... C E Miller
Net Sta Gen (1980) .... 13,195,136,000 kwhr
Steam Turbine Gen Cap .... 2,177,694 kw
Gas Turbine Gen Cap .... 14,500 kw (1 Unit)
Natural Gas
Unit 1 - 477,000 kw | Unit 3 - 530,930 kw
Unit 2 - 477,000 kw | Unit 4 - 692,764 kw

TOWNS SERVED AND POPULATION

Alief 3,367, Alta Loma 2,317, Bacliff 2,723, Barrett 3,919, Baytown 56,650, Bellaire 14,936, Boling 1,081, Brookshire 2,138, Brookside 1,432, Bunker Hill 3,742, Cedar Bayou 1,379, Channelview 17,464, Clear Lake City 25,364, Cloverleaf 2,930, Clute 9,536, Crosby 1,599, Danbury 1,347, Deer Park 22,550, East Bernard 2,768, El Lago 3,112, Freeport 13,241, Galena Park 9,837, Galveston 61,601, Gulf Park 1,295, Hedwig Village 2,518, Highlands 4,749, Hitchcock 6,311, Houston 1,554,992, Humble 6,652, Hunters Creek 4,210, Jacinto City 8,921, Jersey Village 4,098, Jones Creek 2,602, Katy 5,677, Kemah 1,295, Lake Barbara 14,111, Lake Jackson 19,101, Lakewood 2,797, La Porte 13,862, Lomax 2,974, Manvel 3,467, McNair 2,998, Missouri City 25,323, Mont Belvieu 2,776, Nassau Bay 4,508, Needville 1,428, Oyster Creek 1,470, Pasadena 111,884, Pearland 13,130, Piney Point 2,942, Prairie View 3,601, Richmond 9,710, Richwood 2,582, Rosenberg 17,707, Santa Fe 7,254, Seabrook 4,647, Sealy 3,888, Sheldon 2,431, Shore Acres 1,237, So Houston 13,182, So Side Place 1,372, Spring 1,124, Spring Valley 3,355, Stafford 4,758, Sugarland 8,535, Taylor Lake 3,651, Tomball 3,973, Waller 1,237, Wallis 1,127, Webster 2,142, W Univ Place 11,973, Wharton 9,016

SOUTHWESTERN ELECTRIC POWER CO.
428 Travis St, P O Box 21106, Shreveport, La 71156
Tel: 222-2141, Area Code 318

See listing in Louisiana for pertinent information

SOUTHWESTERN ELECTRIC SERVICE CO.
1310 Mercantile Bank Bldg, Dallas, Tex 75201
Tel: 741-3125, Area Code: 214

Chmn, Board & Pres .... C D Goforth
VP & Treas .... D L Corley - Jacksonville, Tex
VP, & Gen Opr Mgr .... L D Long
VP, Engrg & Opr .... D C Fairbanks - Jacksonville, Tex
Sec .... G Hibbs
Supt, Sys Opr .... R A Perry - Jacksonville, Tex
Supv, Pur & Stores .... J D Spraggins - Jacksonville, Tex
Mgr Marketing Svc .... K D Van Cleave - Jacksonville, Tex
Mgr, Per & Insurance .... E W Hall - Jacksonville, Tex

1.0 PURPOSE

This directive provides instructions for the collection, coding, and analysis of deficiencies identified by HL&P for trends adverse to quality and the evaluation of the trend analysis results for BPC/ESI identified deficiencies provided by BPC and ESI.

2.0 SCOPE

This directive includes the trending of deficiencies identified by BPC, ESI, and Project and Corporate HL&P QA personnel during the conduct of procurement, design, and construction activities for the South Texas Nuclear Project.

3.0 DEFINITIONS

None

4.0 REFERENCES

4.1 PSQP-15.2 Stop Work

4.2 PSQP-16.1 Corrective Action

4.3 PSQP-15.1 Nonconformance Reports

4.4 ~~PSQP-16.2~~ QAD-15.1 Deficiency Notices

4.5 PSQP-18.2 Corporate Audits

5.0 RESPONSIBILITY

5.1 The Supervisor, Quality Systems/Administration is responsible for implementing this directive.

5.2 The Supervisor, Training & Administration is responsible for maintaining this directive.

6.0 REQUIREMENTS

HL&P Quality Systems/Administration (QS/A) personnel shall perform trend analysis of deficiency documents generated by Project and Corporate HL&P personnel and will review and evaluate the trend analysis performed by BPC and ESI.

6.1 Trend Analysis of HL&P Deficiency Documents

6.1.1 The following HL&P deficiency documents shall be reviewed for potential adverse trends.

Corrective Action Reports (CARs)

Audit Deficiency Reports (ADRs)

Nonconformance Reports (NCRs)

Deficiency Notices (DNs)

6.1.2 Upon initiation of the above document, the initiator will document the cause code describing the root cause of the deficiency along the bottom of the document. The cause code will consist of a two character main code with a supplemental third character if provided and applicable (Attachments 3 and 4). Copies of ADRs/NCRs/DNs will be forwarded to QS/A upon initiation, QS/A will retain a copy of CARs upon transmittal to the responsible organization. Upon receipt, QS/A will encode the following information on the deficiency document.

6.1.2.1 Organization - The group responsible for performing the activity which generated the deficiency. Two character codes are provided on Attachment 1.

6.1.2.2 Activity - The activity which generated the deficiency. Two character codes are provided on Attachment 2.

6.1.2.3 Deficiency Type - A description of what was wrong with the deficient item (Attachment 3). As with the cause code, the two character code for each main deficiency type may be used along if the subcategories are not provided or are not appropriate.

The codes will be indicated along the bottom of the document in the following format:

Cause - Organization - Activity - Deficiency Type

Example: CAR G-052 The BPC PQPM, Rev. 1 was issued without HL&P review and approval.

Cause (Attach. 4)	Organization (Attach. 1)	Activity (Attach. 2)	Deficiency Type (Attach. 3)
H2c	B10	03	Plg

If multiple items are identified on the deficiency document two or more codes may be used to ensure adequate retrieval and comparison capabilities. Multiple codes may also be used for deficiency documents identifying single items if one code in any or all categories does not adequately describe the condition.

Example: CAR G-085

1. Records are not stored according to ANSI requirements and access requirements are not enforced.
2. Procedures are not developed describing filing methods.

	Cause (Attach. 3)	Organization (Attach. 1)	Activity (Attach. 2)	Deficiency Type (Attach. 3)
Item 1	02	B8	G12	S2
Item 2	02	B8	G12	A2 Pla

The code of "other" should be used only when no other code in a particular category applies. Deficiency documents coded with "other" in any category will be evaluated periodically by QS/A to determine if additional codes are necessary.

The trend codes and other pertinent information related to each deficiency document, i.e., ADR/CAR/NCR/DN number, description, etc., will be entered into the HL&P Trend Analysis computer program.

6.1.3 Each month a listing of all deficiency documents issued during the previous month and their trend codes will be generated by QS/A. The codes will be analyzed for specific recurrence and general trends in the following manner:

6.1.3.1 To obtain information of specific recurrences, each "organization-activity-type" combination for the present reporting period will be compared to code combinations generated during past reporting periods.

recurrence will be investigated. A Trend Investigation Request (TIR) will be generated in accordance with Paragraph 5.1.4, if warranted, otherwise an explanation will be provided in the Monthly Trend Report.

6.1.3.2 Analysis of general trends will be performed by the preparation of graphs for each trend category used during that reporting period (Attachment 5). The graphs will indicate the following information:

Total number of deficiencies for each reporting period.

Number of CARs/ADRs/DNs representing programmatic deficiencies.

Number of CARs/ADRs/DNs representing implementation deficiencies.

Number of NCRs.

The graphs will be monitored for general upward/downward tendencies only, no predefined "acceptable" or maximum number of deficiencies will be established. Upward trends will be investigated for cause. A TIR will be generated, if warranted, otherwise an explanation will be provided in the "Trend Evaluation Results" section of the graph.

In both cases the initiation of a TIR will be based on the judgement of QS/A personnel with assistance from personnel knowledgeable in the specific area, if necessary.

6.1.4 A TIR will be issued by QS/A to the HL&P QA Supervisors, BPC PQAM, or appropriate subcontractor management personnel responsible for the specific deficiency(s) when sufficient evidence is available to suspect the development of a trend that is adverse to quality. The information contained in Section 1 of the TIR will be documented by the initiator. The Supervisor, QS/A will review and approve the TIR prior to issuance. The TIR will be issued to the responsible party via a cover letter prepared by QS/A and signed by the PQAM. A response date of no more than 30 calendar days from on the cover letter will be assigned. Written response extension requests may be granted by the Supervisor, QS/A if good cause has been demonstrated.

6.1.5 The responsible party will conduct an investigation to determine whether a trend exists and document the results in Section 2 of the TIR. If no trend was identified, the will be signed and returned to QS/A. If a trend was identified, Section 3 will be completed, the TIR will be signed and returned to QS.A.

6.1.6 QS/A will review the investigation results for adequacy and verify implementation of corrective action/recurrence control, if applicable. The results will be documented in Section 4 of the TIR.

6.1.7 The TIR will be closed by the initiator and approved by the Supervisor, QS/A upon satisfactory verification of the corrective action/recurrence control. If no trend was identified, the TIR will be closed after a review for adequacy of the investigation results.

6.1.8 TIRs issued as a result of deficiencies identified by Corporate QA personnel during audits of offsite subcontractors will be issued by QS/A via a cover letter signed by the Manager, Quality Assurance. QS/A will review the investigation results for adequacy, Corporate QA personnel will verify implementation of corrective action/recurrence control, if applicable. Closure of the TIR will be handled in accordance with paragraph 6.1.7.

6.1.9 Unsatisfactory responses, evidence that an inadequate investigation was conducted by the responsible organization to determine whether a trend exists, or failure to implement corrective action/recurrence control shall be handled at the discretion of the Supervisor, QS/A and may be directed to a higher level of management.

6.1.10 TIRs will be monitored on a quarterly basis for recurrence. Repetition of a previously identified and confirmed trend may be handled in accordance with PSQP-15.2 or directed to an appropriate level of management for resolution.

6.1.11 The results of the trend analysis, as well as any charts and graphs generated, will be presented in a Monthly Trend Analysis Report. The report will be issued in accordance with a distribution list maintained by the Supervisor QS/A and will include the Executive Vice President, Nuclear Group, Manager QA, and Project QA Manager at a minimum.

6.2 Evaluation of BPC and ESI Trend Results

BPC and ESI classify and evaluate deficiency documents initiated by their respective organizations for signs of adverse trends. Reports are provided to HL&P on a monthly basis summarizing the results of these investigations and any recommended action to be taken. It is the responsibility of QS/A to evaluate these reports for thoroughness of evaluation and accuracy of results. QS/A personnel will conduct a survey of a sample of the information contained in the trend reports after receipt of the reports. This survey will include, but will not be limited to, a review of the following points:

6.2.1 Information Gathering

a) Verify inclusion of all deficiency documents generated during the reporting period.

6.2.2 Coding

a) Verify accuracy and consistency of codes assigned to deficiency documents.

b) Determine whether categories of codes are adequate to describe the range of deficiencies documented.

6.2.3 Evaluation

a) Verify that reviews were made of all categories where recurrence were identified.

b) Verify that appropriate action was taken when a potential trend was identified.

6.2.4 Results

a) Verify that responses to trend CARs/TIRs show evidence of a thorough investigation and adequate corrective action and recurrence control, if applicable.

6.2.5 The results of the survey will be included in the Monthly Trend Report to file. Deficiencies identified during the survey will be handled in accordance with PSQPs-15.1, 16.1 or 16.2 A summary of significant results will be included in the Project QA Monthly Report.

7.0 DOCUMENTATION

7.1 Quality Assurance Records

The following documents are considered Quality Assurance records and shall be transmitted to STP RMS by the Supervisor, Quality Systems/Administration.

7.1.1 Monthly Trend Analysis Reports

7.1.2 Trend Analysis Requests (TIR)

7.2 Reference Documents

7.2.1 Trend Analysis Graph

7.3 Attachments

7.3.1 Attachment 1 - Organization Trend Codes

7.3.2 Attachment 2 - Activity Trend Codes

7.3.3 Attachment 3 - Cause/Deficiency Type Trend Codes

7.3.4 Attachment 4 - Cause Codes

7.3.5 Attachment 5 - Trend Analysis Graph

7.3.6 Attachment 6 - Trend Investigation Request (TIR)

ATTACHMENT 1

ORGANIZATION

Each code will consist of a letter identifying the company followed by a number identifying the organization

H. HL&P

1. Construction
2. Engineering
3. Environmental Protection
4. Licensing
5. Nuclear Fuels Department
6. Procurement
7. Project Administration
8. Project Manasgement
9. QA
10. QC
11. RMS
12. Startup
13. Support Services
14. Other

B. BPC

1. Construction
2. Corporate Contracts
3. Engineering
4. Home Office
5. Procurement
6. Project Administration
7. Project Management
8. RMS
9. Supplier QA
10. QA
11. QC
12. Other

E. ESI

1. Construction
2. Engineering
3. Home Office
4. PPM

ATTACHMENT 1 (CONT.)

ORGANIZATION

E. ESI (cont.)

5. Procurement
6. QA
7. QC
8. Other

W. WESTINGHOUSE

1. EMD
2. NFD
3. NSD
4. SMD
5. WRD
6. Other

ATTACHMENT 2

ACTIVITIES

Each code will consist of a letter identifying the discipline followed by a number identifying the activity.

G. GENERAL

1. Audits/Inspections/Surveillances
2. Design Control
3. Document Control
4. Housekeeping
5. Instructions, Procedures, and Drawings
6. Material Control
7. Nonconformance/Corrective Action Control
8. NRC Commitments
9. NSSS
10. Procurement Document Control
11. Receiving Inspection
12. Records Control
13. Storage and Maintenance
14. Test Control
15. Training and Certification
16. Other
17. Calibration
18. Measuring and Test Equipment

E. ELECTRICAL

1. Batteries
2. Cable Trays/Supports
3. Cable
4. Calibration
5. Conduit
6. Instrumentation
7. Meggering
8. Miscellaneous Electrical Equipment/Systems
9. NSSS
10. Other

C. CIVIL

1. Cadwelding
2. Coatings

ATTACHMENT 2 (CONT.)

ACTIVITIES

C. CIVIL (cont.)

3. Concrete Production
4. Concrete Test
5. Concrete Placing
6. Curing and Repair
7. Grouting
8. Embeds/Penetration
9. Geotechnical Monitoring
10. Miscellaneous Civil Equipment/Systems
11. Post-Tensioning
12. Rebar
13. Soils
14. Structural Steel and Fasteners
15. Other

M. MECHANICAL

1. Hangers, Supports, Restraints
2. HVAC
3. Miscellaneous Mechanical Systems/Equipment
4. NDE
5. NSSS
6. Piping
7. Rigging and Handling
8. Welding
9. Other

ATTACHMENT 3

CAUSE/DEFICIENCY TYPE

Each code will consist of a letter/number combination identifying the deficiency type or cause followed by an optional lower case letter providing additional clarification, if supplied and appropriate.

A1 Assembled/Fabricated Incorrectly

A2 Access Control Deficiencies
- a) Incorrect
- b) No access limitations

A3 Audits/Inspections/Surveillances
- a) Missed
- b) Inadequate

C1 Cadwelding Deficiencies
- a) Improper/Duplication of ID numbers
- b) Location inadequate

C2 Coatings Deficiencies
- a) Lack of adhesion
- b) Under/over millage
- c) Shelf life expired
- d) Storage improper

C3 Concrete Deficiencies
- a) Out of line, grade, plumb
- b) Improper consolidation
- c) Excessive grout
- d) Inadequate weather protection
- e) Wrong mix

C4 Calibration Deficiencies
- a) Not performed
- b) Out of calibration
- c) No calibration tags
- d) Not traceable to national standard

C5 Certification Deficiencies

D1 Damaged/Deteriorated

ATTACHMENT 3 (CONT.)

CAUSE/DEFICIENCY TYPE

D2 Dimension Incorrect

D3 Documentation/Records Deficiencies
- a) Inaccurate or no review/approval
- b) Inadequate/Inaccurate
- c) Not forwarded
- d) Files inaccurate/incomplete
- e) Inaccurate or no tracking document (log, index, checklist)
- f) Documented/controlled by unauthorized individual(s)
- g) Unauthorized distribution
- h) Wrong form
- i) Overdue
- j) Uncontrolled
- k) Not developed

D4 Drawing Deficiencies
- a) Requirements not met
- b) Wrong revision
- c) Misinterpretation

E1 Equipment Failure/Malfunction

H1 Housekeeping Deficiencies
- a) Trash, debris
- b) Standing water

I1 Missing/Inaccurate Identification
- a) Equipment
- b) Nonconformances

I2 Incorrect Installation

L1 Leaking

L2 Location Incorrect

L3 Loose

ATTACHMENT 3 (CONT.)

CAUSE/DEFICIENCY TYPE

M1 Maintenance Deficiencies
- a) Inadequate/Inaccurate
- b) None

M2 Material Control Deficiencies
- a) Incorrect material
- b) Lack of traceability

N1 Notification not given

N2 NDE Deficiencies
- a) RT - Improper source to film distance
- b) RT - Penetrameter not visible
- c) RT - Wrong films
- d) RT - Improper development
- e) RT - Improper density
- f) PT - Inadequate cleaning
- g) PT - Improper application
- h) PT - Incorrect development time
- i) PT - Incorrect temperature
- j) PT - Mixing families of penetrants
- k) MT - Prod burns
- l) MT - Improper orientation
- m) MT - Misapplied iron particles
- n) UT - Wrong couplants
- o) UT - Wrong Transducer
- p) UT - Improperly adjusted instrument
- q) Improper interpretation

O1 Out of adjustment

O2 Other

P1 Procedural/Program Deficiencies
- a) None developed
- b) Does not incorporate requirements
- c) Inaccurate/inadequate/unclear
- d) Incorrect revision
- e) Not issued/controlled/distributed
- f) Wrong format
- g) Not reviewed/approved

ATTACHMENT 3 (CONT.)

CAUSE/DEFICIENCY TYPE

P1 Procedural/Program Deficiencies (cont.)
- h) Wrong procedure/requirements used

Q1 Qualification Deficiencies
- a) Unqualified

R1 Rebar Deficiencies
- a) Rusted/corroded
- b) Spacing incorrect
- c) Improper count

S1 Shipping/Handling Deficiency

S2 Inadequate/Incorrect Storage

S3 Structural Steel Deficiencies
- a) Out of alignment
- b) Torquing/tension deficiency

S4 Soils Deficiencies
- a) Improper test location/test frequency
- b) Lack of cross sections
- c) Density deficiencies
- d) Contaminated

S5 Specification Deficiencies
- a) Requirements not met
- b) Wrong revision
- c) Misinterpretation

T1 Testing Deficiencies
- a) Failed (out of tolerance)
- b) Not done
- c) Incorrectly performed

T2 Training/Indoctrination Deficiencies
- a) Inadequate
- b) None given

T3 Tolerances Exceeded.

ATTACHMENT 3 (CONT.)

CAUSE/DEFICIENCY TYPE

W1 Worn

W2 Welding Deficiencies
- a) Incorrect pre/post heat treatment
- b) Incorrect preparation
- c) Incorrect filler material
- d) Incorrect process
- e) Weld defect
- f) Base material defect
- g) Incorrect equipment
- h) Distortion

ATTACHMENT 4

CAUSE CODES

The following list provides additional cause codes which are not interchangeable with deficiency type codes. Each code will consist of a number/letter combination describing the cause followed by an optional lower case letter providing additional clarification if supplied and appropriate.

H2 Human Error
- a) Insensitive to requirements
- b) Inattention to detail (frequent, although inadvertent, deviation)
- c) Oversight (isolated deviation)

I3 Inadequate or lack of management support

I4 Inadequate supervision

I5 Insufficient personnel

U1 Unknown/Undetermined

HOUSTON INDUSTRIES INCORPORATED

CAPITAL STRUCTURE

LONG TERM DEBT

Issue	Rating	Amount Outstanding	[4]Times Charges Earned 1981	1980	Interest Dates	Call Price	Price Range 1981	1980
1. Houston Lighting & Power Co., conv. subord. deb. 5½s, due 1985	A2	[3]$37,820,000	2.04	3.11	F & A 1	[2]100.54	88½- 82⅛	88 - 77
2. Subsidiaries' debt	....	[5]1,890,139,000			....	.....	....	....

CAPITAL STOCK

Issue	Par Value	Amount Outstanding	Earned per Sh. 1981	1980	Divs. per Sh. 1981	1980	Call Price	Price Range 1981	1980
1. Common	No par	[1]68,861,000 shs.	[1]$3.14	[1]$3.14	[6]$2.24	$2.68	.....	[7]21¾- 16⅝	31⅝- 24⅝

[1] Based on avg. shs. as reported by Co.; adjusted for 3-for-2 split in May 1981. [2]Subject to change, see text. [3]Pursuant to the corporate restructuring plan in 1977, Co. assumed joint and several liability with Houston Lighting & Power Co. for payment of principal and interest on debs. issued by Houston Lighting & Power Co. [4]Times over-all charges (after income tax). [5]As of Dec. 31, 1981; excludes $40,000,000 subord. debt of Houston Lighting & Power Co. due parent. [6]Includes $0.74 paid prior to 3-for-2 split. [7]After 3-for-2 split; before, 29⅞-25.

HISTORY

Organized in Tex. in Oct. 1976 by Houston Lighting & Power Co. (Houston Lighting).

On Jan. 14, 1977, pursuant to a merger and corporate restructuring plan, Co. became the owner of all of the outstg. com. stock of Houston Lighting and two of its former subsidiaries, Primary Fuels, Inc. and Utility Fuels, Inc. In the merger and restructuring, each share of the outstg. com. stock of Houston Lighting became one share of Co. com. stock. In addition, Houston Lighting's outstg. convertible debentures became convertible into Co. com. stock.

BUSINESS

Co. is a holding company, which thru its principal subsidiary (Houston Lighting) is engaged in the generation, transmission, distribution and sale of electric energy, serving an area of the Texas Gulf Coast Region.

Thru other subsidiaries, Co. is engaged in oil and gas exploration and in the acquisition and delivery of fuels to electric generating plants. See "Properties" below.

PROPERTIES

Thru its subsidiary, Houston Lighting & Power Co., Co. owns and operates generating facilities with an aggregate nameplate capacity of 11,607,502 kilowatts. Primary Fuels, Inc. has a 50% interest in an oil and gas exploration venture that has leased approx. 67,000 offshore acres from the State of Texas. Venture also has a Federal lease of approx. 11,000 acres. Also, PFI has committed to a five-well program in the Anadarko Basin of Oklahoma with one company, a deep Ellenburger test in Pecos County, Texas, with a second firm, and participation with a third company in a lease acquisition and drilling program in an Abo gas prospect in eastern New Mexico. Additionally, PFI has decided not to continue participating in a joint exploration program with Shell Oil Company. Nevertheless, PFI will continue in 1982 with its participation in Shell-related exploratory wells drilling at year-end 1981, and in continuing development drilling of Shell-related discoveries already made.

Another subsidiary, Utility Fuels, Inc., was organized in 1973. It currently owns the railroad cars and coal handling equipment necessary to provide coal supply services to Houston Lighting & Power Company.

SUBSIDIARIES (wholly-owned)

Houston Lighting & Power Company
Primary Fuels, Inc.
Utility Fuels, Inc.
See appended statement.

LETTER TO SHAREHOLDERS

The following is the letter to shareholders of Don D. Jordan, President and Chief Executive Officer of Houston Industries Incorporated as it appeared in the Company's 1981 Annual Report:

TO OUR SHAREHOLDERS:

Nineteen eighty-one was a year of mixed financial results for Houston Industries Incorporated. Net income increased 18 percent. Houston Lighting & Power Company's net income was up 27 percent. Primary Fuels, Inc. and Utility Fuels, Inc. posted losses; however, we expect the two subsidiaries to show an improved performance in 1982.

PFI experienced a net loss of $2.5 million due to participation in a drilling program with Shell Oil Company. While the joint program has resulted in several promising discoveries, the longer-term development and production objectives of Shell make determination of values difficult at this time. Primary Fuels will not participate in the Shell 1982 exploration program and will direct its resources toward shorter term oil and gas prospects.

UFI reported a net loss of $5.2 million as a result of a $10.8 million after tax write-down of its investment in a uranium project. This reduction was necessary to reflect the current market value of uranium.

Dividend Increased Three Times

The quarterly dividend was increased twice in 1981, and again in January 1982 to 54 cents per share, for an annual rate of $2.16. This keeps Houston Industries among the leaders in the industry in dividend increases. Since 1978, the dividend has grown at an average annual rate nearly double that of the electric utility industry.

Changes Made at STP

At the South Texas Project we now have two outstanding firms on board with the capabilities needed to successfully complete this jointly-owned nuclear project.

Bechtel Power Corporation was named in September to replace Brown & Root as design engineer and construction manager of STP and in February 1982 Ebasco Services, Inc. was selected as the project's new constructor, subject to satisfactory contract negotiations.

The experience of Bechtel's personnel will enable design and engineering to progress more rapidly at STP. Ebasco is a highly experienced constructor that has engineered or built more than 40 nuclear facilities and 950 fossil and hydro units. Non-safety-related construction is scheduled to start up again by July, with safety-related work on STP targeted for September.

Allens Creek Being Re-evaluated

HL&P is re-evaluating its plans for its other nuclear project—the Allens Creek Nuclear Generating Station. The company has the option of completing Allens Creek as a nuclear plant or the use of the Allens Creek site for a coal plant. Considering the possibility that Allens Creek may not be built as a nuclear facility, HL&P is exploring the market possibilities for the sale of major items of equipment it has already bought or committed to purchase. The company is also considering its ability to obtain rate relief, so expenditures on Allens Creek might be amortized over an appropriate period of time. During the study period, expenditures associated with the project will be reduced to an absolute minimum.

Four Units Accelerated

Activity associated with both HL&P's nuclear projects has been considerably less than expected and as a result expenditures for these units are lower than earlier projected. This has allowed the company to accelerate the estimated operational dates of four lignite-fired generating units by one year.

Two units at the Limestone Electric Generating Station, on which the company broke ground in October, are now scheduled for completion in 1986 and 1987. Two more units at the Malakoff Electric Generating Station are now scheduled to be operational in 1988 and 1989. The announcement of the Malakoff site was made in December; site work will start in 1983.

Dividend Reinvestment Expected To Qualify

Another positive development for HL&P has been passage of the Economic Recovery Tax Act of 1981. One provision of the law permits shareholders who reinvest cash dividends in the common stock of utility companies to exclude from income up to $750 per year ($1,500 on joint returns) of the dividends, starting in 1982. We believe HI's Dividend Reinvestment Plan will qualify for this tax deferred treatment.

Load Management, Purchased Power Essential

Even though HL&P has one of the country's largest power plant construction programs, purchased power and load management will also be required to meet the service area's anticipated energy needs for the remainder of this decade.

In February 1982, HL&P signed a letter of intent with the Southern Company to purchase 500 megawatts of capacity a year from 1985 through 1992. The contract, when finalized, should help the company improve its reserve margin and provide HL&P with additional energy at competitive prices. The company will continue to buy power under contracts it has with City Public Service Board of San Antonio and the City of Austin. The company is presently negotiating with other utilities for purchased power.

Also in February, HL&P began a rebate program for customers who buy heat pumps or high efficiency air conditioners. Low interest weatherization loans are now also available to HL&P customers. These programs are designed to encourage conservation and reduce growth in demand for electricity which will benefit all customers.

HL&P is pursuing additional programs through load management and conservation to reduce peak electrical demand at least 1,200 megawatts by the end of this decade. This would be the equivalent of deferring the construction of two coal-fired units the size of Unit 8 being built at the company's W.A. Parish plant.

Progress Made in Washington

In our nation's capital, we were successful in our efforts to amend legislation that would have forced the company to stop using natural gas as a boiler fuel by the end of 1989. Still, uncertainties regarding the availability and price of natural gas dictate that we reduce our dependence on gas with all due speed.

Management Changes Made

In order to continue strong continuity in management, a number of major organizational changes were made in 1981. Four HL&P executives were promoted to vice president and another vice president formerly with the Tennessee Valley Authority was added to head our nuclear operations staff. Primary Fuels selected a president to head its operations and added four vice presidents, including one to run PFI's newly-created Western District in Denver.

Houston Lighting & Power celebrates its 100th anniversary this year. While we reflect on our first 100 years of operation, we continue to plan and look forward to our next century of service. Reaching this milestone provides both an opportunity and a compelling reason to rededicate ourselves to the concepts that have made our company great.

As we embark on this second century we ask for your support to help us make our next 100 years even better than the first.

Don D. Jordan
President and Chief Executive Officer

Houston, Texas
March 22, 1982

MANAGEMENT

Officers

D.D. Jordan, Pres. & Chief Exec. Off.
G.W. Oprea, Jr., Vice-Pres.
D.D. Sykora, Vice-Pres.
H.R. Dean, Vice-Pres. & Treas.
J.R. Johnston, Sec. & Asst. Treas.
J.S. Brian, Asst. Sec. & Asst. Treas.
Wm. R. Brown, Gen. Counsel

Directors

(Showing Age & Principal Corporate Affiliations)

Searcy Bracewell (64), Member of the Houston law firm of Bracewell & Patterson.

William R. Brown (67), General Counsel of Co. and Member of the Houston law firm of Baker & Botts.

H.R. Dean (56), Vice-Pres. and Treas., Co.; Exec. Vice-Pres., Houston Lighting & Power Co.

John C. Echols (49), Chmn. of Bd. and Chief Exec. Off., Citizens Bank and Trust Co.

Howard W. Horne (55), Chairman of the Board, The Horne Co.; Director, Allied Bank of Houston.

D.D. Jordan (49), Chairman of the Board and Chief Exec. Off., Houston Lighting & Power Co. and President and Chief Exec. Officer Co.; Dir., Hughes Tool Co.; Dir., Texas Commerce Bancshares, Inc.

Thomas B. McDade (58), Vice-Chmn. of Bd., Texas Commerce Bancshares.

G.W. Oprea, Jr. (55), Vice-Pres., Co.; Exec. Vice-Pres., Houston Lighting & Power Co.

Stewart Orton (66), Executive Vice President, Federated Department Stores, Inc.; Foundation: Dir., Bank of the Southwest, N.A.

Donald D. Sykora (51), President and Chief Operating Officer, Houston Lighting & Power Co.

Willard E. Walbridge (69), Consultant to Capital Cities Communications, Inc.; Director, International Systems and Controls Corporation.

Joe C. Wessendorff (64), Rancher and private investor.

Auditors: Deloitte Haskins & Sells.

Counsel: Baker & Botts.

Shareholder Relations: J.R. Johnston, Sec. & Asst. Treas. **Tel.:** (713)229-7247.

Director Meetings: First Wed. of Jan., Apr., July and Oct.

Annual Meeting: Second Wed. in May.

No. of Stockholders: Feb. 16, 1982, 52,079.

No. of Employees: Dec. 31, 1981, 9,471.

Executive Office: Electric Tower, Houston, TX 77002. **Tel:** (713)228-2474.

Mailing Address: 611 Walker, P.O. Box 4505, Houston, TX 77210.

INCOME ACCOUNTS

COMPARATIVE CONSOLIDATED INCOME ACCOUNT, YEARS ENDED DEC. 31
(in thousands of dollars)

	1981	1980	1979	1978	1977
Revenues:					
Electric	2,769,215	2,123,957	1,707,572	1,303,604	1,069,786
Fuel sales	279,119	202,953	105,686	20,823	6,305
Oil and gas	46,997	40,354	40,901	25,011	19,470
Total	3,095,331	2,367,264	1,854,159	1,349,438	1,095,561
Expenses:					
Electric:					
Fuel	1,578,531	1,206,872	958,112	682,261	517,870
Oper. and maint.	479,280	331,060	256,693	196,942	159,093
Other taxes	90,327	80,856	69,968	60,172	51,435
Cost of fuel sold	246,898	180,373	82,170	15,489	6,319
Oil and gas oper. exp.	10,793	8,883	6,755	5,449	3,960
Depr., depl. and amort.	156,181	129,483	109,445	81,010	69,073
Total	2,562,010	1,937,527	1,483,143	1,041,323	807,750
Operating Income	533,321	429,737	371,016	308,115	287,811
Other Income:					
[1]Allow. for funds used during constr.	39,058	32,735	31,928	17,029	14,088
Other—net	[2](19,089)	3,057	(3,792)	2,689	611
Total	19,969	35,792	28,136	19,718	14,699
Fixed Charges:					
Interest on long-term debt	154,697	129,139	107,447	87,140	71,888
Other interest	30,107	16,566	11,992	7,566	3,393
[1]Allow. for borrow. funds used during constr.	(23,907)	(18,302)	(20,205)	(11,639)	(9,821)
Preferred div. of sub.	20,042	20,042	19,765	17,330	13,711
Total	180,939	147,445	118,999	100,397	79,171
Inc. Before Federal Inc. Taxes	372,351	318,084	280,153	227,436	223,339
Federal Income Taxes:					
Current	21,367	10,466	5,925	(3,074)	13,211
Deferred:					
Liberalized deprec.	40,081	39,507	32,316	34,511	27,367
Invest. tax credit	60,049	43,685	57,758	50,833	47,635
Oil & gas	16,574	11,286	6,014	7,117	(2,310)
Other—net	17,925	29,159	16,294	9,392	11,800
Total	155,996	134,103	118,307	98,779	97,703
Net Income	216,355	183,981	161,846	128,657	125,636
Retained earnings beg. of period	731,406	652,573	569,364	505,165	432,165
Common stock divs.	137,289	105,148	78,637	64,458	52,636
Retained earnings end of period	810,472	731,406	652,573	569,364	505,165

[1]HL&P accrues AFUDC, net of federal income taxes, on construction projects and nuclear fuel payments except for amounts included in the rate base by regulatory authorities. During 1979, 1980 and 1981 the accrual rates were 7½%, 8½% and 9¼%, respectively. The borrowed funds component of AFUDC, before federal income taxes, is reflected in the statements of consolidated income as a credit to fixed charges and the other funds component is shown as other income.

[2]Includes a $20,063,000 write-down of investment in uranium project.

Statements of Changes in Consolidated Financial Position, years ended Dec. 31 (in $000):

	1981	1980
Source of funds:		
Operations:		
Net income	216,355	183,981
Depr., depl. and amort.	163,016	134,009
Def. fed. inc. taxes—net	74,580	79,952
Invest. tax credit def.—net	52,644	43,685
Allow. for funds used during constr.	(62,964)	(51,037)
Write-down of inv. in uranium proj.	20,063	......
Total	463,694	390,590
Com. stock. dividends	(137,289)	(105,148)
Reinvest. funds from oper.	326,405	285,442
Financing and other:		
Sale of com. stk.	173,502	175,272
Funds rec. from poll. contr. rev. bond proc. held by trust	96,260	5,000
Sale of first mortg. bonds	125,000	100,000
Sale of secur. notes	64,542	31,552
Chge. in notes pay. & temp. inv.	45,423	88,015
Recl. to curr. mat. of lg.-tm. debt	(8,886)	(29,605)
Decr. (incr.) in work. cap.	(22,319)	73,180
Other—net	(18,555)	2,962
Total	781,372	731,818
Application of funds:		
Constr. and nuclear fuel expend. and lignite adv. (net)	698,744	664,843
Oil, gas, and mining expend.	82,628	66,975
Total	781,372	731,818

BALANCE SHEETS

COMPARATIVE CONSOLIDATED BALANCE SHEET, YEARS ENDED DEC. 31
(in thousands of dollars)

	1981	1980	1979	1978	1977
ASSETS					
Electric plant	5,392,633	4,667,329	3,979,127	3,449,549	2,940,831
Electric plant acq. adjustments	3,166	3,166	3,166	3,166	3,166
Oil, gas and mining property	233,928	196,364	129,226	89,348	57,245
Total	5,629,727	4,866,859	4,111,519	3,542,063	3,001,242
Less accumulated deprec., depl. and amort.	856,037	735,550	622,656	528,083	458,483
Prop., plant and equip.—net	4,773,690	4,131,309	3,488,863	3,013,980	2,542,759
Current Assets:					
Cash in banks	11,560	13,027	12,690	10,606	12,263
Temp. cash investments, at cost	600	2,000	52,129	69,064	......
Working funds and special deposits	9,132	5,382	5,269	4,650	3,953
Accounts receivable:					
Customers	110,942	84,247	63,853	58,239	41,564
Others	22,347	22,652	22,578	31,721	25,353
Fuel stock:					
Oil, at average cost	80,968	66,364	47,843	49,367	51,405
Coal, at lifo cost	97,913	23,277	50,015	25,304	......
Materials and supplies, at average cost	49,983	32,107	32,978	24,023	20,072
Other	3,480	3,239	14,316	2,444	2,727
Total current assets	386,925	252,295	301,671	275,418	157,337
Deferred Debits	70,158	49,334	44,163	25,363	19,769
Total assets	5,230,773	4,432,938	3,834,697	3,314,761	2,719,865
LIABILITIES					
Common stock (no par)	940,639	767,137	591,865	457,515	392,425
Retained earnings	810,472	731,406	652,573	569,364	505,165
Total com. stk. equity	1,751,111	1,498,543	1,244,438	1,026,879	897,590
Cum. preferred stock of subsidiary	243,518	243,518	243,518	213,945	214,000

BALANCE SHEETS (Cont'd):	1981	1980	1979	1978	197[illegible]
5½% Conv. debentures due 1985	37,820	39,506	39,918	39,933	[illegible]
Long-term debt of subsidiaries	1,881,253	1,604,337	1,497,390	1,377,646	[illegible]
Total	3,913,702	3,385,904	3,025,264	2,658,403	[illegible]
Current Liabilities:					
Notes payable	170,523	126,500	88,614	56,497	[illegible]
Accounts payable	245,964	149,174	122,665	115,628	[illegible]
Taxes accrued	44,804	33,525	26,206	21,099	[illegible]
Interest accrued	42,588	31,110	29,305	28,491	[illegible]
Accrued liab. to municipalities	57,962	45,557	36,008	27,972	[illegible]
Dividends declared	5,010	5,010	5,010	4,332	[illegible]
Current portion of long-term debt	8,886	29,603	7,530	3,930	[illegible]
Other	25,625	23,147	16,471	17,114	[illegible]
Total current liabilities	601,362	443,628	331,809	275,063	[illegible]
Deferred Credits:					
Accum. def. federal income taxes	396,430	332,556	252,176	192,855	[illegible]
Unamort. investment tax credit	298,002	244,704	202,148	153,161	[illegible]
Other	13,157	17,761	14,931	26,779	[illegible]
Total def. credits	707,589	595,021	469,255	372,795	[illegible]
Property Insurance Reserve	8,120	8,385	8,369	8,500	[illegible]
Total liabilities	5,230,773	4,432,938	3,834,697	3,314,761	2,719,[illegible]
Net current assets	d214,437	d191,333	d30,138	355	d[illegible]

[2] Less accumulated provision for uncollectible accounts.
[3] See footnote [1] under company only Balance Sheet, above.
[4] Consisting of all preferred shares of Houston Lighting & Power Co.

Electric Plant, Dec. 31, 1981 ($000):	
Production	1,931,310
Transmission	373,563
Distribution	1,022,589
General	250,379
Construction work in progress	1,526,434
Nuclear fuel in process	121,683
Coal handling equipment	166,675
Total	5,392,633

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

(As Taken From Annual Report of Company)

1. Summary of Significant Accounting Policies.

System of Accounts

The accounting records of Houston Lighting & Power Company (HL&P), the principal subsidiary, are maintained in accordance with the Federal Energy Regulatory Commission's Uniform System of Accounts which has been adopted by the Public Utility Commission of Texas (Utility Commission).

Principles of Consolidation

The consolidated financial statements include the accounts of the Company and its wholly-owned subsidiaries, HL&P, Primary Fuels, Inc. (PFI) and Utility Fuels, Inc. (UFI). Fuel sales and related cost of fuel sold generally represent UFI coal sales to HL&P and are not eliminated because of the distinction for regulatory purposes between utility and non-utility operations. All other significant intercompany transactions and balances are eliminated in consolidation.

Plant

Additions to electric plant, reduced by contributions in aid of construction, betterments to existing property and replacements of units of property are capitalized at cost. Cost includes the original cost of contracted services, direct labor and material, indirect charges for engineering supervision and similar overhead items and an allowance for funds used during constuction (AFUDC).

Maintenance of property and replacements and renewals of items determined to be less than units of property are charged to expense. The actual or average book costs of units of property replaced or renewed are removed from plant and such costs plus removal cost, less salvage, are charged to accumulated depreciation.

HL&P and UFI compute depreciation using the straight-line method. The depreciation provision as a percentage of the depreciable cost of plant was 3.7% for 1981 and 3.6% for 1980 and 1979.

Oil and Gas Property

The full-cost method of accounting is used for oil and gas operations. Accordingly, all costs of acquisition, exploration and development of properties are capitalized. Depreciation, depletion and amortization of these costs are determined on the unit-of-production method based on the estimated proved reserves of oil and gas properties. Depreciation, depletion and amortization amounted to $30,805,000, $20,895,000 and $11,350,000 ($2.37, $1.40 and $.62 per equivalent unit-of-production), for the years ended December 31, 1981, 1980 and 1979, respectively.

Allowance for Funds Used During Construction

HL&P accrues AFUDC, net of federal income taxes, on construction projects and nuclear fuel payments except for amounts included in the rate base by regulatory authorities. During 1979, 1980 and 1981 the accrual rates were 7½%, 8½% and 9¼%, respectively. The borrowed funds component of AFUDC, before federal income taxes, is reflected in the Statements of Consolidated Income as a credit to fixed charges and the other funds component is shown as other income.

Revenues—Electric

Revenues are recognized from the sale of electricity as bills are rendered to customers. Rate schedules include fuel adjustment clauses which permit recovery of fuel expenses in the month incurred.

Federal Income Taxes

The Company follows a policy of comprehensive interperiod income tax allocation. Investment tax credits are deferred and amortized over the estimated lives of the related property.

Property Insurance Reserve

The cost of replacing uninsured plant losses of HL&P, less related tax effects, are charged against the reserve when incurred. Effective January 1980, additional accruals to the reserve have been denied by regulatory authorities.

Earnings Per Common Share

Earnings per common share are computed by dividing net income by the weighted average number of shares outstanding during the respective periods. Common stock equivalents outstanding during the periods did not have a material dilutive effect on earnings per share. Amounts shown for 1980 and 1979 have been restated to reflect a three-for-two stock split effective May 26, 1981.

2. Common Stock.

At the 1981 Annual Meeting, shareholders approved a resolution amending the Articles of Incorporation to increase the authorized common stock, without par value, from 75,000,000 to 125,000,000 shares. Common stock issued during 1981, 1980 and 1979 amounted to 9,932,388 shares, 10,038,350 shares and 7,294,778 shares, respectively, restated for the stock split.

3. Preferred Stock.

Any part or all of HL&P's preferred stock may be redeemed at the option of the Company at the following per share prices, plus any unpaid accrued dividends to date of redemption:

$4.00 Series—$105.00. $6.72 Series: through July 31, 1983—$103.51; thereafter—$102.51. $7.52 Series: through Oct. 31, 1982—$105.35; thereafter—$103.35 to $102.35. $9.52 Series: through Sept. 30, 1985—$109.52; thereafter—$105.00 to $101.00. $9.08 Series: through March 31, 1986—$105.00; thereafter—$103.00 to $101.00. $8.12 Series: through Nov. 30, 1982—$109.37; thereafter—$106.25 to $102.25. $9.04 Series: through Jan. 31, 1984—$109.04; thereafter—$105.00 to $101.00.

4. Long-Term Debt.

At Dec. 31, 1981, sinking or improvement fund requirements of HL&P's first mortgage bonds outstanding will be $29,950,000 for the year 1982, $30,950,000 for the years 1983 and 1984, $30,350,000 for the year 1985 and $29,750,000 for the year 1986. Of such requirements, $16,100,000 for the years 1982 through 1984, $15,800,000 for the year 1985 and $15,500,000 for the year 1986 may be satisfied by certification of property additions at 100% of the requirements and the remainder through certification of such property additions at 166⅔% of the requirements. Sinking or improvement fund requirements for 1981 and prior years have been satisfied by certification of property additions.

Annual maturities of long-term debt and minimum capital lease payments are approximately $12,327,000 in 1982, $68,587,000 in 1983, $77,162,000 in 1984, $106,817,000 in 1985 and $41,997,000 in 1986.

The issuable amount of HL&P first mortgage bonds is unlimited as to authorization, but limited by property, earnings, and other provisions of the mortgage and deed of trust and the supplemental indentures thereto. Substantially all properties of HL&P and UFI are subject to liens securing their long-term debt.

5. Short-Term Financing.

The interim financing requirements of the Company's operating subsidiaries are met through short-term bank loans and the issuance of commercial paper. HL&P, PFI and UFI have bank lines of credit aggregating $515,000,000 at year end 1981 (as compared with $410,000,000 in 1980) which limit their total short-term borrowings and provide for interest at rates generally less than the prime rate. Bank loans and commercial paper outstanding were $117,300,000 and $52,570,0[illegible] Dec. 31, 1981 and $78,300,000 and $47,330,[illegible] at Dec. 31, 1980, respectively. Compensating balances are not required under these lines of credit, however, a commitment fee of ¼ of 1% per annum is required on the undrawn portion of $75 million of the lines.

6. Retirement Plan.

The Company has a noncontributory retirement plan covering substantially all employees. The policy of the Company is to fund pension costs accrued, which includes amortization of prior service costs, over a period of thirty to forty years.

The total cost of the Company's retirement plan for each of the years 1981, 1980 and 1979 was $8,765,000, $7,563,000 and $6,223,000, respectively. The assumed rate of return on plan investments is 7%.

A comparison of accumulated plan benefits and plan net assets for the Company's retirement plan is presented below:

Actuarial present value of accumulated plan benefits:

	January 1, 1981	198[illegible]
Vested	$57,356,000	$49,280,[illegible]
Nonvested	7,170,000	4,179,[illegible]
	$64,526,000	$53,459,[illegible]
Market value of net assets available for plan benefits	$96,995,000	$67,272,[illegible]

7. Commitments and Contingencies.

Significant commitments have been incurred in connection with HL&P's construction program and for nuclear fuel purchases. The construction program (exclusive of AFUDC) is presently estimated to cost $[illegible] million in 1982, $1,119 million in 1983 and $1,256 million in 1984. An additional $85 million is expected to be spent for uranium concentrate and nuclear fuel processing services for HL&P's South Texas nuclear plant. Commitments in connection with HL&P's construction program, principally for generating plants and related facilities, are generally revocable by HL&P subject to reimbursement of manufacturers for expenditures incurred or other cancellation penalties. In addition, during the 1982-1984 period, UFI expects to spend $178 million for coal and lignite supply related equipment of which $29 million is expected to be spent in 1982, $51 million in 1983 and $98 million in 1984. PFI expects to spend approximately $78 million on oil and gas exploratory and development activities during 1982.

UFI has entered into financing arrangements for coal transportation equipment which are treated as capital leases for financial accounting purposes. The Company has no other material lease commitments.

8. Nuclear Project Re-evaluation.

HL&P recently began a re-evaluation of its proposed 1,200-megawatt Allens Creek nuclear project as a result of continuing uncertainties in construction schedules and cost estimates caused by inflation, regulatory delays and changing regulatory requirements. Among the matters being considered in the re-evaluation of the Allens Creek project are completion of the nuclear generating station as presently designed, use of the plant site for a coal-fired generating station, the availability of prospective purchasers of the major items of equipment which HL&P has already purchased or committed to purchase and the ability of HL&P to recover the Allens Creek expenditures through rates over an appropriate period. It is anticipated that a final decision respecting the future of the Allens Creek project will be made by the end of 1982. Until such decision is made, expenditures in connection

...n the project will be kept as low as possi-...

...s of Dec. 31, 1981, approximately $388 mil-...n had been spent or accrued on the Allens ...eek project. In the event HL&P should elect ...o terminate the project and thereafter be unable to have others assume its obligations with respect to equipment it has committed to pur-...ase, HL&P could incur additional costs, in ...ounts which cannot presently be deter-...ined, but which could be substantial.

In the event HL&P should elect to termi-...ate the Allens Creek project without being ...ranted related rate relief, any unrecovered ...sts would be written off against income ...pon such determination. No estimate can be ...iven of the potential magnitude of any such ...rite-off. HL&P's mortgage and corporate ...harter specify earnings coverage and other ...onditions which must be complied with prior ...o the issuance of any additional First Mort-...age Bonds or additional shares of Preferred ...ock, respectively. Under such provisions, a ...rite-off of any significant amount could se-...erely limit or prevent the issuance by HL&P ...f First Mortgage Bonds and Preferred Stock ...ased on the financial results for the twelve-...onth period following the write-off.

9. Jointly-Owned Electric Plant.

HL&P is project manager and one of four participants in the South Texas Nuclear Proj-...ect, which consists of two 1,250 megawatt nu-...lear generating units. Each participant fi-...ances its own share of construction expendi-...ures with HL&P's participating interest in ...e project being 30.8%. As of Dec. 31, 1981, HL&P's share of expenditures included in ...onstruction work in progress and nuclear ...uel in process were $538 million and $54 mil-...ion, respectively. For further discussion, see "South Texas Project Takes New Direction," ...age 13.

10. Federal Income Taxes.

Effective federal income tax rates are lower ...an statutory corporate rates for each year ...follows (in $000's):

	Year Ended Dec. 31, 1981	1980	1979
...et fed. inc. ...axes	372,351	318,084	280,153
...erred div. of ...sub.	20,042	20,042	19,765
Total	392,393	338,126	299,918
...tory rate	46%	46%	46%
...inc. taxes at statutory corp. rate	180,501	155,538	137,962
...uction in taxes resulting from:			
...low. for other funds used during constr.	17,967	15,058	14,687
Other—net	6,538	6,377	4,968
Total	24,505	21,435	19,655
...inc. taxes	155,996	134,103	118,307
...ctive rate	39.8%	39.7%	39.4%

The Company had an investment tax credit carryover of approximately $9,240,000 at Dec. ... 1981.

11. Supplementary Expense Information (in ...000's):

	Year Ended Dec. 31, 1981	1980	1979
...xes, other than inc. taxes, were chgd. to exp. as ...lows:			
...ectric:			
Ad valorem	43,571	42,686	42,666
State gross receipts	24,182	20,717	16,044
Payroll	10,276	7,467	6,189
PUC assessment	4,121	3,671	2,885
Miscellaneous	8,177	6,315	5,069
Total	90,327	80,856	72,853
Taxes included in ...il and gas oper. exp.	5,492	5,081	3,778
Total	95,819	85,937	76,631
Research and develop. costs chgd. to exp.	9,003	7,731	6,046

12. Unaudited Quarterly Information.

The following unaudited quarterly financial information for 1980 and 1981 includes, in the Company's opinion, all adjustments (which comprise only normal recurring accruals) necessary for a fair presentation (in $000's):

	Rev.	Oper. Inc.	Net Inc.	[1] Earn. Per Com. Sh.
Mar. 31, 1980	459,307	70,288	28,176	.52
June 30, 1980	581,425	93,890	39,892	.69
Sept. 30, 1980	755,713	169,937	79,239	1.34
Dec. 31, 1980	570,817	95,622	[2] 36,674	.57
Mar. 31, 1981	609,402	88,634	33,387	.51
June 30, 1981	759,698	117,069	48,043	.70
Sept. 30, 1981	970,094	201,995	95,117	1.38
Dec. 31, 1981	756,137	125,623	[2] 39,808	.56

[1] Quarterly earnings per common share are based on the weighted average number of shares outstanding during the quarter and the sum of the quarters may not equal annual earnings per common share. Amounts shown have been restated to reflect a three-for-two stock split effective May 26, 1981.

[2] In Dec. 1980 and Nov. 1981, based on updated reserve estimates, adjustments for depreciation, depletion and amortization of approximately $8,000,000 and $6,400,000, respectively, were charged against income. In Dec. 1981, Utility Fuels wrote down to estimated recoverable value its investment in a uranium strip mining project resulting in a charge of $20,063,000.

REPORT OF CERTIFIED PUBLIC ACCOUNTANTS

(As Taken From Annual Report of Company)

We have examined the consolidated balance sheets and the statements of subsidiaries' preferred stock and long-term debt of Houston Industries Incorporated and subsidiaries as of Dec. 31, 1981 and 1980 and the related statements of consolidated income, consolidated retained earnings and changes in consolidated financial position for each of the three years in the period ended Dec. 31, 1981. Our examinations were made in accordance with generally accepted auditing standards and, accordingly, included such tests of the accounting records and such other auditing procedures as we considered necessary in the circumstances.

As discussed in Note 8, HL&P, a subsidiary of the Company, recently began a re-evaluation of its Allens Creek nuclear generating facility. Certain alternatives under consideration could result in substantial unrecoverable costs, but the ultimate outcome cannot be determined at this time. In our report dated Feb. 16, 1981, our opinion on the 1980 and 1979 consolidated financial statements was unqualified; however, in view of the matter referred to above, our present opinion on such consolidated financial statements, as expressed herein, is different from that expressed in our previous report.

In our opinion, subject to the effects on the consolidated financial statements of such adjustments, if any, as might have been required had the outcome of the uncertainty referred to in the preceding paragraph been known, such consolidated financial statements present fairly the financial position of the Company and its subsidiaries at Dec. 31, 1981 and 1980 and the results of their operations and the changes in their financial position for each of the three years in the period ended Dec. 31, 1981, in conformity with generally accepted accounting principles applied on a consistent basis.

DELOITTE HASKINS & SELLS

Houston, Texas
February 12, 1982

SUPPLEMENTARY INFORMATION TO DISCLOSE THE EFFECTS OF CHANGING PRICES (UNAUDITED)

Financial statements of business enterprises, in accordance with generally accepted accounting principles, reflect historical costs and dollars of varying purchasing power and accordingly do not measure the effects of inflation. The following unaudited supplementary information is supplied in accordance with the requirements of Financial Accounting Standards Board (FASB) Statement No. 33, Financial Reporting and Changing Prices, for the purpose of providing certain information regarding the effects of both general inflation (constant dollars) and changes in specific prices (current cost), which are not reflected in traditional financial statements. Constant dollar amounts represent historical costs stated in terms of dollars of equal purchasing power, as measured by the Consumer Price Index for all Urban Consumers (CPI-U). Current cost amounts reflect the changes in specific prices of property from the date the property was acquired to the present and may differ from constant dollar amounts to the extent that specific prices have increased more or less rapidly than prices in general. This information should be viewed only as an estimate of the approximate effect of inflation rather than as a precise measurement.

The Company's principal subsidiary, HL&P, in common with other electric utility companies in general, continues to be adversely impacted by the effects of an inflationary economy. Certain effects of inflation, such as higher interest costs associated with long-term bonds and increased operating and maintenance costs, are reflected in traditional financial statements. Increased revenues to recover such expenses, however, tend to lag behind the actual incurrence of such increased costs. Electric rates are generally based on historical costs and are designed to allow the electric utility an opportunity to recover its operating costs and earn a fair rate of return on its investment in property, plant and equipment. However, in a highly inflationary environment, expenses have increased at a much greater rate than the increase in electric sales which has resulted in an erosion of return on invested capital. It is unlikely that rates based on historical costs can keep pace with increased costs during inflationary periods. This has resulted, in part, in the need for larger and more frequent rate increases.

There are a number of other effects of inflation which are not reflected in traditional financial statements and to which the accompanying supplementary information is intended to give effect. One major expense so affected is depreciation. The cost of constructing and replacing property, plant and equipment has been escalating dramatically. Historical financial statements reflect depreciation based on the historical costs of assets and do not reflect the true economic cost of the asset "used up" and which must be replaced at substantially higher future values. However, a substantial amount of such assets are financed with long-term bonds and preferred stock which effectively acts as a hedge against the impact of inflation. Utility plants financed from investment by common shareholders and retained earnings are not afforded such a hedge. While a certain amount of the impact on such depreciation is reduced through higher returns allowed on the common equity investment in property when electric rates are established, the end result of continuing inflation is an erosion of the common shareholder's investment when viewed in terms of real purchasing power.

The Company has made significant increases in the common stock dividend over the last several years. Actual annual per share cash dividends, adjusted to give effect to the three-for-two stock split, have increased from $1.24 in 1977 to $1.99 in 1981. However, when restated in terms of average 1981 dollars, the dividend increases appear much more modest, going from $1.86 in 1977 to $1.99 in 1981. It is significant that the common stock dividends, in real terms, have been able to keep pace with inflation over the last five years, a period of very high inflation. When restated in terms of average 1981 dollars, the annual dividend rate for 1978 and 1979 was $1.97 and $1.98 for 1980, with the 1981 rate being $1.99. While this indicates that no significant growth has occurred in common stock dividends, the purchasing power of common dividends has been maintained.

Statement of Consolidated Income Adjusted For Changing Prices

(For the Year Ended Dec. 31, 1981)

(In Thousands of Dollars)

	Conventional Historical Cost	Constant Dollar Average 1981 Dollars	Current Cost Average 1981 Dollars
Revenues	3,095,331	3,095,331	3,095,331
Expenses:			
Electric	2,148,138	2,148,138	2,148,138
Cost of fuel sold	246,898	246,898	246,898
Oil and gas operating expenses	10,793	10,793	10,793
Depreciation, depletion and amortization	156,181	280,479	293,723
Income taxes	155,996	155,996	155,996
Fixed charges and other income—net	160,970	160,970	160,970
Net Income (excluding reduction to net recoverable cost)	216,355	[1] 92,057	78,813

	Conventional Historical Cost	Constant Dollar Average 1981 Dollars	Current Cost Average 1981 Dollars
[1]Increase in specific prices (current cost) of property, plant and equipment held during the year			572,[illegible]
Less increase in cost of property, plant and equipment adjusted for changes in general price level			642,[illegible]
Excess of increase in general price level over increase in specific prices			(70,[illegible])
Reduction of utility property to net recoverable costs		(244,488)	(165,[illegible])
Gain from decline in purchasing power of net amounts owed		243,907	243,[illegible]
Net		(581)	8,[illegible]

[1]Including the reduction to net recoverable cost, loss on a constant dollar basis would have been $152,431 for 1981.
[2]At Dec. 31, 1981, current cost of property, plant and equipment, net of accumulated depreciation was $8,106,890, while historical cost was $4,773,690.

Property, plant and equipment as referred to in the accompanying data includes utility plant in service, land, land rights and property held for future use, nuclear fuel in process, construction work in progress, coal handling equipment and oil, gas and mining property. The constant dollar information was determined by adjusting historical amounts by the ratio of the average level of the CPI-U during the year the assets were acquired or constructed to the average CPI-U index for 1981. Current cost of utility properties was determined primarily by indexing surviving plant by the Handy-Whitman Index of Public Utility Construction Costs. Oil and gas properties were restated to current costs primarily by adjusting historical costs by externally developed indexes for onshore and offshore properties. Current cost information does not represent the replacement cost of the Company's productive capacity since plant would not be replaced precisely in kind, but rather is an approximation of the current cost of existing assets.

The constant dollar and current cost provisions for depreciation were determined by applying the Company's historical depreciation rates to the restated property amounts. Restatement of depreciation, depletion and amortization of oil, gas and mining properties was computed by applying historical unit-of-production rates to the restated property amounts.

As allowed by FASB No. 33, items in the income statement, other than depreciation, depletion and amortization, were not adjusted. The cost of fuel used in electric generation and operating and maintenance expenses are essentially stated in terms of average current year prices and therefore do not require [illegible] statement.

In accordance with FASB No. 33, federal income tax expense has not been adjusted. Current federal income tax policy recognizes to a certain extent the effects of inflation. Liberalized depreciation allowances and the investment tax credit accelerate capital recovery. However, as the statutory federal income tax rate has remained stable, the effective rate has increased significantly as a result of the declining purchasing power of the related taxable income. The Company's effective federal income tax rate in 1981, when adjusted for inflation, is 58 percent under constant dollar and 61 percent under current cost, each of which exceeds its reported effective tax rate of [illegible] percent and the statutory rate of 46 percent.

Five-Year Comparison of Selected Supplementary Financial Data Adjusted for Effects of Changing Prices

(In Thousands of Average 1981 Dollars, except per share amounts)

	1981	1980	1979	1978	1977
Revenues					
Historical	3,095,331	2,367,264	1,854,159	1,349,438	1,095,[illegible]
Constant dollar	3,095,331	2,612,815	2,323,242	1,881,202	1,644,[illegible]
Net Income					
Historical	216,355	183,981	161,846		
Constant dollar	92,057	94,393	112,894		
Current cost	78,813	81,911	95,135		
[1]Earnings per share					
Historical	$3.14	$3.14	$3.23		
Constant dollar	1.34	1.61	2.25		
Current cost	1.14	1.40	1.89		
Common Stock Equity at year-end (including electric utility property only to the extent recoverable)					
Historical	1,751,111	1,498,543	1,244,438		
Constant dollar	1,762,126	1,645,315	1,517,049		
Current cost	1,777,032	1,650,529	1,517,451		
Gain from decline in purchasing power of net amounts owed	243,907	316,487	332,703		
Excess of increase in general price level over increase in specific prices	70,298	118,325	336,115		
[1]Cash dividends declared per common share					
Historical	$1.99	$1.79	$1.57	$1.41	$1.[illegible]
Constant dollar	1.99	1.98	1.97	1.97	[illegible]
[1]Market price per common share year end					
Historical	$18.13	$19.00	$19.42	$18.25	$2[illegible]
Constant dollar	17.54	20.03	23.01	24.50	[illegible]
Average consumer price index	272.4	246.8	217.4	195.4	[illegible]

[1]Amounts shown for 1977 through 1980 have been restated to reflect a three-for-two stock split effective May 26, 1981.

Under the rate making prescribed by regulatory authorities to which HL&P is subject, only the historical cost of plant is recoverable through depreciation. Therefore, the excess of the cost of utility plant stated in terms of constant dollars and current cost that occurred as a result of inflation in the current year over the historical cost of utility plant is not presently recoverable in rates as depreciation and is reflected as a reduction to net recoverable cost.

To properly reflect the economics of rate regulation in the Statement of Income Adjusted for Changing Prices, the reduction of net property, plant and equipment should be offset by the gain from the decline in purchasing power of net amounts owed. During a period of inflation, holders of monetary assets suffer a loss of general purchasing power while holders of monetary liabilities experience a gain. The gain from the decline in purchasing power of net amounts owed is primarily attributable to the substantial amount of debt and preferred stock which has been used to finance property, plant and equipment. However, since the depreciation on this utility plant is limited to the recovery of historical costs, HL&P does not have the opportunity to realize a holding gain, and is limited to recovery of only the embedded cost of such capital. Thus, to the extent that utility plant is financed with debt and preferred stock the reduction to net recoverable cost and the holding gain essentially offset each other.

As a result of regulation, HL&P does not have the freedom to raise its prices in response to inflation. Further, except in the case of fuel costs, the regulatory process introduces a substantial time lag between the incurrence of operating and capital costs and the recovery of such costs. This "regulatory lag" is one of the most significant factors contributing to the erosion of investor capital. Compounding the problem is the fact that HL&P must compete in the same marketplace as a non-regulated enterprise for capital necessary to finance its construction program.

MANAGEMENT'S DISCUSSION AND ANALYSIS OF FINANCIAL CONDITION AND RESULTS OF OPERATION.

(As Taken From Annual Report of Company)

General

The Company's operating results have generally declined over the last three years. HL&P's earnings have improved as a result of rate increases which have been approved and implemented approximately once each year. However, its overall financial condition has been adversely affected by increasing negative pressures of construction financing during periods of high inflation and erratic electric sales due to uncertain economic conditions, weather and energy conservation. Primary Fuels' operating results have been markedly lower each of the last three years primarily as a result of increased depletion, depreciation and amortization expense associated with substantial capital expenditures without the establishment of significant proved reserves. The write-down of an investment in a uranium project to estimated recoverable value caused Utility Fuels to experience a loss during 1981, while earnings associated with its coal supply activities have remained constant over the last three years.

The percentage of HL&P's construction program that was financed by funds generated from operations as well as interest coverages increased during 1981 as a result of rate relief granted in October 1980 and construction expenditures remaining level over the last two years. HL&P's return on average common equity has improved somewhat during the past two years principally as a result of $106 million of rate relief realized in 1980 and $147 million in 1981. Nevertheless, as discussed under "Supplementary Information to Disclose the Effects of Changing Prices", electric rates have not kept pace with inflation. As a result, HL&P has been unable to earn the returns on common equity granted by the Public Utility Commission in its rate orders. HL&P's authorized returns on common equity for 1980 and 1981 were 15% and 15.8%, but the actual returns were 13.4% and 14.3%, respectively.

Another indication of the Company's general financial condition is the portion of net income attributable to the allowance for funds used during construction (AFUDC). AFUDC, a non-cash item, rose during 1981 because of increases in construction balances and increased accrual rates due to higher costs of capital. However, AFUDC as a percentage of earnings declined in the last two years due to HL&P earning larger current cash returns on its invested capital. Much of this improvement can be attributed to a $500 million increase in the amount of construction work in progress and nuclear fuel in process allowed in rate base by rate regulatory authorities over the last two years.

Net income for 1981 was 18% higher than for 1980. Earnings per share, however, remained unchanged on a 17% increase in the weighted average number of shares outstanding. HL&P's contribution to the Company's per share earnings reflects an increase of 2[illegible] cents, while Primary Fuels and Utility Fuels each experienced losses for the year. To help finance new construction, 9 million shares of additional common stock (with net proceeds of $156 million), $125 million of First Mortgage Bonds and $96 million of pollution control bonds were sold in 1981 resulting, in part, in the improvement in the Company's capitalization ratios.

Results of Operation

The contribution of Primary Fuels to the Company's earnings was 23¢ per share in 1979, primarily as the result of increased sales of oil and gas. Primary Fuels' earnings in 19[illegible] and 1981 were adversely affected by substantial expenditures in its oil and gas exploration program which caused depletion, depreciation and amortization expenses to increase $[illegible] million and $9.5 million for 1981 and 1980, respectively. In addition, gas and oil sales have not kept pace with increased operating expenses. Gas and oil sales by Primary Fuels decreased by 13% and 19% during 1981 and 1980, respectively, as a result of decreased demand and a normal decline in productive capacity. Decreased sales, however, were completely offset by increased prices. These factors, coupled with the increase in the Company's average shares outstanding, caused Primary Fuels' contribution to the Company's earnings per share in 1980 to dip to 6¢ and caused it to experience a loss of 4¢ per share in 1981.

Utility Fuels' coal supply contract with HL&P allows Utility Fuels to recover its costs plus a fixed return on its net investment [illegible] facilities. Thus, Utility Fuels' earnings associated with its fuel delivery operations have remained fairly constant over the last three years. The $5.2 million loss results from [illegible] after tax write-down of $10.8 million for [illegible] investment in approximately 1.1 million pounds of uranium. Approximately 400,[illegible]

...ands of the uranium were sold in December ...81. Utility Fuels is actively seeking other ...yers. As a result of the write-down, subsequent sales are not expected to have a material effect on earnings.

Earnings for HL&P increased in each of the last three years as a result of sales growth and rate increases, but were adversely affected by rapid escalation in operation and maintenance costs and rising interest rates. Although fuel expense has nearly doubled since 1979, earnings were generally unaffected due to adjustment clauses in the electric service rate schedules. The effects these factors and others have had on HL&P's results of operation are detailed below.

Revenues. As shown below, the majority of the increase in electric operating revenues has been due to the recovery of increased fuel costs through fuel adjustment clauses.

Comparative Periods	% of Revenue Increase Attributable to: Recov. of Incr. Fuel Costs	Rate Incr.	Incr. Sales
1979 v. 1978	63%	22%	15%
1980 v. 1979	63%	25%	12%
1981 v. 1980	69%	23%	8%

Increasing construction expenditures to meet load growth, coupled with inflationary pressures, have required HL&P to seek rate increases more frequently. As a result, new rates have been placed in effect in each of the past three years. KWH sales increases have averaged 4% over the last three years, contributing to the growth in revenue. This growth rate is lower than experienced historically due to conservation by customers and, in 1980 and 1981, economic conditions adversely affecting the larger industrial customers. Because of the widespread use of air conditioning, weather also significantly affects KWH sales in the HL&P service area, primarily in the residential class. An unseasonably mild summer negatively influenced 1979 electricity usage. However, an extended heat wave in 1980 caused residential KWH usage to attain record levels and average usage per residential customer increased from 13,522 KWH in 1979 to 14,219 KWH in 1980. More normal weather during the summer of 1981 contributed to a decrease in average use to 13,590 KWH for the year.

Fuel Expense. These costs have nearly doubled since 1979. The increase in the price of fuel and, to a lesser extent, increased KWH generation are the contributing factors. The rapid increase in fuel costs has contributed to the increase in HL&P's average residential revenue per KWH from 4.09¢ in 1979 to 6.29¢ in 1981. Substantially all of HL&P's natural gas requirements are being met under long-term contracts; however, larger quantities of such gas are being purchased at near-market prices. With natural gas deregulation, these costs can be expected to continue their steep incline. The increases in cost of coal for each year are due to higher delivered prices for the coal and larger requirements by HL&P for its W.A. Parish plant. HL&P brought new coal-fired units into service in each of the years 1978 through 1980. A fourth unit is scheduled to go into service prior to the 1983 peak season.

Purchased Power Expense. The increase in these costs reflects purchases of economy energy from other utilities in Texas and purchases of energy under firm contracts with neighboring utilities to meet peak loads. Four percent of HL&P's energy requirements was met with purchased power in 1981 and it is expected that reliance on other utilities will increase throughout the next several years.

Operating and Maintenance Expenses. Operation and maintenance costs have increased at a compound rate of 25% over the last three years because of general inflationary pressures, the use of larger, more complicated generating and pollution control equipment and substantial increases in labor costs. Increased reliance on coal-fired power plants has added significantly to the costs of operation and maintenance. The employee work force has increased by about 19% over the last three years as a result of increasingly complex construction and business activities, additional government regulations and the number of customers being served.

Non-Operating Items. These items are generally related to HL&P's construction activities. The costs of financing have steadily risen due to a number of factors, including larger external funds requirements, investors' expectations of continued inflation and increased competition for funds among the major users of capital. AFUDC represents the cost of funds used to finance construction projects and is capitalized as part of the cost of the assets. AFUDC is a non-cash item of net income and represents a cost-recoverable from customers through provisions for depreciation in future periods. Increases in amounts for AFUDC not only correspond to increases in construction expenditures, but also to increases in the AFUDC accrual rate and the level of investment in construction that is not earning a current cash return. Since January 1979, AFUDC has been computed using a net of tax rate closely following the company's rising embedded cost of capital. The AFUDC accrual rates for 1979 through 1981 were 7.5%, 8.5% and 9.25%, respectively. Effective Jan. 1, 1982, HL&P began accruing AFUDC at a rate of 10.0%.

Liquidity and Capital Resources

The capital requirements for 1981, and as estimated for 1982 through 1984, are as follows (in $ millions):

	1981	1982	1983	1984
Constr. and nuclear fuel (exclud. AFUDC)	644	792	1,137	1,300
Railroad cars, coal handling facilities and lignite mining and handling facilities	65	29	51	98
[1]Oil and gas expl. and develop.	73	78		
Maturities of lg.-tm. debt	30	9	65	74
Total	812	908	1,253	1,472

[1]Primary Fuels' expenditures for oil and gas exploration subsequent to 1982 cannot be estimated until the results of its 1982 exploration and development program are known.

Construction and nuclear fuel expenditures represent estimated costs of HL&P's construction program. The estimated expenditures for railroad cars, coal handling facilities and lignite mining and handling facilities are anticipated by Utility Fuels in connection with HL&P's major generating station projects.

HL&P expects to finance a portion of its construction program through funds generated internally from operations. The ability of HL&P to fund a portion of its capital requirements from internal funds is dependent to a large degree on regulatory practices which determine construction work in progress in rate base, depreciation rates, recovery of the cost of fuel used in the generation of electricity and the opportunity to earn competitive rates of return on its invested capital. It is presently estimated that during the next three years 35% to 40% of HL&P's construction program can be financed through internally generated funds from operations assuming HL&P can obtain rate relief on a timely basis at levels comparable to those recently granted by the Utility Commission.

The remainder of HL&P's construction program will be financed through proceeds received from the sale of common stock by the Company and the sales of preferred stock and long-term debt by HL&P. HL&P's capitalization ratios at December 31, 1981 consisted of 48% long-term debt, 6% preferred stock and 46% common stock and retained earnings with similar ratios expected to be maintained in the future. Principally because of HL&P's large capital requirements, Moody's Investors Service, Inc. lowered its rating of HL&P's First Mortgage Bonds and Preferred Stock in 1980 from Aa to A. In November 1981, Standard & Poor's Corporation lowered its ratings from AA to A+ for similar reasons and due to uncertainties surrounding the construction of the jointly-owned South Texas Project nuclear units. Duff & Phelps rates HL&P's bonds the equivalent of AA−. As a result of such downgradings, HL&P's expects relatively higher capital costs in connection with its future sales of long-term debt and preferred stock.

Capital requirements of Utility Fuels in excess of internally generated funds are expected to be financed principally through sales of long-term debt and from leveraged leases, both involving guarantees by the Company. Primary Fuels' expenditures for 1982 are expected to be met from internally generated funds, short-term borrowings and, possibly, sales of production payments.

For information regarding bank lines of credit and short-term borrowings see Note 5 to the Consolidated Financial Statements.

FINANCIAL & OPERATING RATIOS

INCOME ACCOUNT (Consolidated):

	1981	1980	1979	1978	1977
Operating ratio %	82.77	81.84	79.99	77.16	73.72
[1]Times charges earned	2.04	3.11	2.16	2.15	2.41
Earned per avg. com. sh.	$3.14	$3.14	$3.23	$2.80	$2.94
No. of common shs. (avg.)	68,861,000	58,613,000	50,156,000	45,885,000	42,718,000
PRICE RANGES					
Common	[3]21¾-16⅝	31⅝-24⅝	31⅝-26¼	33⅜-26⅞	36⅛-29¼
[2]Common (adj.)	21.75-16.63	21.13-16.38	21.00-17.50	22.25-17.88	24.00-19.50

[1]Times over-all charges (after income tax). [2]Adj. for 3-for-2 split in 1981. [3]After 3-for-2 split; before, 29⅞-25.

LONG TERM DEBT

1. Houston Lighting & Power Co. convertible subordinated debenture 5½s, due 1985:

Rating—A2

AUTH.—$40,000,000; outstg., Dec. 31, 1981, $37,820,000.

DATED—Feb. 1, 1970. DUE—Feb. 1, 1985.

INTEREST—F&A 1.

TRUSTEE—Bankers Trust Co., NYC.

DENOMINATION—Fully registered, $1,000 and authorized multiples.

CALLABLE—As a whole or in part, on at least 30 days' notice to each Jan. 31, incl., as follows:

1982 ...... 101.08 1983 ...... 100.54 1984 ...... 100.00

SECURITY—Not secured; subordinated to all senior debt.

CONVERTIBLE—Into com. shs. of Houston Industries Incorporated at $22.94 per share (reflecting sale of 4,500,000 common shs. by Houston Industries Incorporated in April 1981, and 3-for-2 stock split in May 1981). No adjustments for interest or divs. except debs. converted after interest record date and prior to interest payment date must be accompanied by interest due on such date. Cash paid in lieu of fractional shs.; conversion privilege protected against dilution.

RIGHTS ON DEFAULT—Trustee or 25% of debs. outstg. may declare principal due and payable (30 days' grace for payment of interest).

INDENTURE MODIFICATION—Indenture may be modified, except as provided, with consent of 66⅔% of debs. outstg.

ASSUMED—By Co. from Houston Lighting & Power Co. pursuant to a corporate restructuring plan in 1977.

LISTED—On New York Stock Exchange.

PURPOSE—Proceeds to general funds to reduce short term debt and for construction.

OFFERED—($40,000,000) at 102 on Jan. 20, 1970 thru Halsey, Stuart & Co., Inc. and Goldman, Sachs & Co. and associates.

PRICE RANGE—	1981	1980	1979	1978	1977
High	88½	88	88	93	98
Low	62⅛	77	81¾	82	86½

2. Subsidiaries Debt

Outstg., Dec. 31, 1981, $1,890,139,000 comprised of:

(1) $1,610,000,000 first mortgage bonds of Houston Lighting, at interest rates ranging from 2¾% to 13⅞%, due at various dates through 2010.

(2) $18,000,000 7¾% water pollution control revenue bonds, due 2004.

(3) $19,200,000 9.5% water pollution control revenue bonds, due 1998.

(4) $5,000,000 9.9% water pollution control revenue bonds, due 1998.

(5) $47,000,000 9% secured notes of Utility Fuels, Inc., due to 1988.

(6) $94,679,000 other subsidiary long term indebtedness.

(7) $65,000,000 11% poll. contr. rev., due 1984.

(8) $11,150,000 14.9% poll. contr. rev., due 1983.

(9) $20,110,000 14.9% poll. contr. rev., due 1983.

CAPITAL STOCK

Houston Industries Incorporated, common; no par:

Auth., 125,000,000 shs.; outstg., Dec. 31, 1981, 73,899,168 shs.; reserved for conversion of debs., 1,609,382 shs.; no par.

No par shs. split 3-for-2 May 26, 1981.

Entitled to one vote per share. No preemptive rights.

Dividends Paid:

1977 ...... $1.86 1978 ...... $2.12 1979 ...... $2.36
1980 ...... 2.68 1981 ...... 0.74

After 3-for-2 stk. split:

1981 ...... 1.50 [1]1982 ...... 1.62

[1]To Sept. 10.

Dividend Reinvestment Plan: Plan permits shareholders to automatically reinvest cash dividends in common stock of Co. optional cash payments of not less than $50 nor more than $3,000 per calendar quarter may be made. One or both options may be chosen with no brokerage fee charged. Plan is qualified with respect to the Economic Recovery Tax Act of 1981 and is administered through Texas Commerce Bank, N.A., Houston TX.

Shareholders should contact Ms. Ann Cherry at Texas Commerce Bank at P.O. Box 2558, Houston, TX 77001 or by telephone at (713)236-4660.

Dividend Disbursing & Transfer Agent: Texas Commerce Bank N.A., Houston.

Registrar: First City National Bank of Houston.

Offered: (2,000,000 shs.) at $34 per sh. (proceeds to Co., $33.03 per sh.) on Feb. 16, 1977 thru Morgan Stanley & Co., Inc. and Dean Witter & Co., Inc. and associates. Proceeds will be invested in the com. stock of Houston Lighting, and used by Houston Lighting in its construction program including repayment of outstg. short-term borrowings incurred in connection therewith.

(2,000,000 shs.) at $29.30 per sh. (proceeds to Co., $28.48 per sh.) on Feb. 22, 1978 thru Morgan Stanley & Co., Inc., Dean Witter Reynolds Inc. and Kidder, Peabody & Co., Inc. Except for approximately $1,000,000 which will be added to the general funds of the Co., the net proceeds will be invested in the common stock of Houston Lighting, and used by Houston Lighting in its construction program including repayment of outstg. short-term borrowings incurred in connection therewith.

(2,000,000 shs.) at $29.125 per sh. (proceeds to Co., $28.385) on Feb. 7, 1979 thru Morgan Stanley & Co., Inc., Dean Witter Reynolds Inc. and Kidder, Peabody & Co., Inc. Except for approximately $2,000,000 which will be added to the general funds of the Co., the net proceeds will be invested in the common stock of Houston Lighting, and used by Houston Lighting in its construction program. To the extent that such proceeds are not immediately so used, they will be invested in short term interest bearing obligations.

(2,500,000 shs.) at $27.50 per sh. (proceeds to Co. $26.76 per sh.) on Oct. 16, 1979 thru Dean Witter Reynolds Inc.; Kidder, Peabody & Co. and associates. Proceeds will be used to reduce short-term construction debt of its principal subsidiary.

(3,000,000 shs.) at $27.375 per sh. (proceeds to Co. $26.48 per sh.) on Apr. 15, 1980 thru Kidder Peabody & Co. Inc.; Dean Witter Reynolds Inc. and associates. Proceeds invested in common stock of Houston Lighting and used by Houston Lighting to repay a portion of outstanding short term debt incurred in its construction program.

(3,000,000 shs.) at $26.50 per sh. on Oct. 2, 1980 thru Dean Witter Reynolds Inc.; Kidder, Peabody & Co. Inc. and associates. Proceeds for construction.

(3,000,000 shs.) at $25.25 per sh. on Mar. 6, 1981 thru Kidder, Peabody & Co. Inc.; Dean Witter Reynolds Inc.; Merrill Lynch White Weld Capital Markets Group and associates. Proceeds for investment in com. stock of Houston Lighting & Power Co., subsidiary, for use by Houston Lighting to defray cost of its construction program.

(4,500,000 no par shs.) at $19 per sh. on Oct. 22, 1981 thru Dean Witter Reynolds Inc., Kidder, Peabody & Co., Inc., Blyth Eastman Paine Webber Inc. and associates. Proceeds will be invested in the com. stock of Co.'s subsidiary, Houston Lighting & Power Co., to pay for expenditures and repay short-term indebtedness incurred in connection with Houston Lighting's construction program.

(4,500,000 shs.) at $18.875 per sh. on April 12, 1982 thru Goldman Sachs & Co. and associates. Proceeds from the additional shs. will be invested by Co., in the com. stock of its subsidiary, Houston Lighting & Power Co., for use by that company to pay for expenditures and repay short term indebtedness incurred in connection with its construction program.

Listed: On NYSE (Symbol: HOU). Also listed on Midwest SE. Unlisted trading on Cincinnati & Pacific Stock Exchanges.

HOUSTON LIGHTING & POWER COMPANY

(Controlled By Houston Industries Incorporated)

CAPITAL STRUCTURE

LONG TERM DEBT Issue	Rating	Amount Outstanding	[1]Times Charges Earned 1981	1980	Interest Dates	[2]Call Price	Price Range 1981	1980
1. First mtge. 2¾s, series due 1985	[3]	$30,000,000			A & O 1	See text	[2].....	[3].....
2. First mtge. 3s, series due 1989	A 1	30,000,000			M & S 1	100.63	51 - 45⅞	55 - 45
3. First mtge. 3¼s, series due 1986	A 1	30,000,000			M & S 1	100.43	66⅜ - 62⅝	67 - 57
4. First mtge. 4¾s, series due 1987	A 1	40,000,000			M & N 1	101.16	63¾ - 59⅛	68 - 58
5. First mtge. 4⅞s, series due 1989	A 1	25,000,000			F & A 1	101.26	58 - 52⅜	64 - 53
6. First mtge. 4½s, series due 1992	A 1	25,000,000			F & A 1	101.76	48⅜ - 42	55 - 43
7. First mtge. 5¼s, series due 1996	A 1	40,000,000			A & O 1	103.21	47⅜ - 39½	55¾ - 42
8. First mtge. 5¼s, series due 1997	A 1	40,000,000			J & J 1	103.50	46½ - 38¾	54¾ - 41
9. First mtge. 6¾s, series due 1997	A 1	35,000,000			M & N 1	104.34	55⅜ - 46	63¼ - 50
10. First mtge. 6¾s, series due 1998	A 1	35,000,000			A & O 1	104.03	55⅛ - 45¾	63¾ - 50
11. First mtge. 7½s, series due 1999	A 1	30,000,000			J & D 1	104.97	58¾ - 49½	68¾ - 55
12. First mtge. 7¼s, due 2001	A 1	50,000,000			F & A 1	105.27	56¼ - 47¼	67½ - 53
13. First mtge. 7½s, due 2001	A 1	50,000,000	3.63	3.56	J & D 1	101.35	57⅝ - 48⅜	69½ - 54
14. First mtge. 8⅛s, due 2004	A 1	100,000,000			F & A 1	107.16	61 - 51½	79 - 58
15. First mtge. 10⅛s, due 2004	A 1	100,000,000			M & S 1	106.55	73¼ - 62⅛	90½ - 72
16. First mtge. 8¾s, due 2005	A 1	125,000,000			M & S 1	107.31	64⅞ - 54⅝	81 - 62
17. First mtge. 8¾s, due 2006	A 1	125,000,000			A & O 1	107.04	62¼ - 52½	76½ - 59
18. First mtge. 8¾s, due 2007	A 1	125,000,000			A & O 1	107.94	62 - 52⅜	76 - 58
19. First mtge. 8⅞s, due 2008	A 1	125,000,000			M & S 1	107.66	65 - 54¾	79½ - 62
20. First mtge. 9¼s, due 2008	A 1	100,000,000			J & D 1	107.85	67⅜ - 56¾	82½ - 65
21. First mtge. 11¼s, due 2009	A 1	125,000,000			J & D 1	109.92	79⅝ - 67⅞	105⅞ - 78
22. First mtge. 12s, due 2010	A 1	100,000,000			J & D 1	110.43	83⅜ - 71¾	105 - 82
23. First mtge. 13⅞s, due 1991	A 1	125,000,000			F & A 1	[15]100	97½ - 88⅜	[4].....
24. First mtge. 15⅛s, due 1992	A 1	[7]125,000,000			M & S 1	[10]100	[7].....	[7].....
25. 5½s debenture, due 1985	....	[12]40,000,000			F & A 1	.....	.....	.....
26. Water poll. contr. rev. 7⅜s, due 2004	[5]	18,000,000			[5].....	[5].....	.....	.....
27. Water poll. contr. rev. 9.5s, due 1998	[2]	19,200,000			[5].....	[5].....	.....	.....
28. Water poll. contr. rev. 9.9s, due 1998	[2]	5,000,000			[5].....	[5].....	.....	.....
29. Water poll. contr. rev. 14.9s, due 1983	[3]	[13]20,110,000			[14].....	[14].....	.....	.....
30. Water poll. contr. rev. 14.9s, due 1983	[3]	11,150,000			[5].....	[2].....	.....	.....
31. Water poll. contr. rev. 11s, due 1984	[2]	[6][13]65,000,000			J & D 1	[14].....	.....	.....

CAPITAL STOCK Issue	Par Value	Rating	Amount Outstanding	Earned per Sh. 1981	1980	Divs. per Sh. 1981	1980	Call Price	Price Range 1981	1980
1. $4 cum. pfd.	No par	"a2"	97,397 shs.			$4.00	$4.00	105	30 3/16 - 25¾	43¼ - 29
2. $6.72 cum. pfd	No par	"a2"	250,000 shs.			6.72	6.72	[2]103.51	50¾ - 43⅜	72⅝ - 49
3. $7.52 cum. pfd.	No par	"a2"	500,000 shs.			7.52	7.52	[2]105.35	56¾ - 48½	81¼ - 54
4. $9.52 cum. pfd.	No par	"a2"	400,000 shs.	$100.19	$80.64	9.52	9.52	[2]109.52	71⅞ - 61⅜	102⅞ - 69
5. $9.08 cum. pfd.	No par	"a2"	400,000 shs.			9.08	9.08	[2]109.08	68½ - 58½	98½ - 64
6. $8.12 cum. pfd.	No par	"a2"	500,000 shs.			8.12	8.12	[2]109.37	61¼ - 52⅜	87⅞ - 59
7. $9.04 cum. pfd.	No par	"a2"	300,000 shs.			9.04	9.04	[2]109.04	68¼ - 58 5/16	97¾ - 66
8. Common	No par	......	[9][8]69,053,418 shs.	[8]3.04	[8]3.01	[9]..	[9]..	.....	[9].....	[2].....

[1]Before Federal income tax. [2]Subject to change, see text. [3]Issued privately. [4]Sold in Feb. 1981. [5]For details, see Gulf Coast Waste Disposal Authority in Industrial Development and Pollution Control Revenue section of Moody's Municipal & Government Manual. [6]Sold in Dec. 1981. [7]Sold in March 1982. [8]Based on avg. shs. as reported by Co. Adjusted for 3-for-2 stk. split May 26, 1981. [9]All held by Parent Co. [10]Beginning March 1, 1989. [12]Pursuant to the corporate restructuring plan in 1978, Houston Industries assumed joint and several liability with Houston Lighting for payment of principal and interest on $40,000,000 of 5½s. Convertible Debentures issued by Houston Lighting. In consideration thereof, Houston Lighting issued Houston Industries a $40,000,000 5½s Debenture. [13]Issued by Brazos River Auth. [14]For details see Brazos River Auth. Moody's Municipal & Gov't. Manual. [15]Beginning Feb. 1, 1988.

HISTORY

Incorporated under the laws of Texas on January 9, 1906 under the name of Houston Lighting & Power Company 1905. The figure 1905 was dropped from the corporate title on April 4, 1922. Since incorporation company has acquired electric properties in the following cities and towns:

1914—Houston Heights (now part of Houston).
1916—Sunset Heights and Brunner (both now part of Houston).
1918—Park Place (now part of Houston).
1925—Goose Creek (now part of Baytown), La Porte, Rosenberg, Richmond and Wharton.
1926—Needville and Humble.
1927—Pasadena, Bellaire, Pelly (now part of Baytown), South Houston and Freeport.
1929—Highlands (now part of Baytown).
1931—Galveston and Hitchcock.
1936—Rosharon.
1941—Sealy.
1946—Velasco.
1950—Sugarland.

Former Control: Until 1942, common stock of this company was owned by National Power & Light Co. Under order of SEC in Integration Proceedings 500,000 Houston shares were offered by National in exchange for its own $6 preferred stock on a basis of two Houston common shares for each National preferred share. 257,336 Houston shares were thus exchanged before termination of offer Dec. 31, 1942. The remainder of 242,664 shares was sold, May 14, 1943, to a syndicate which in turn offered the shares publicly.

Reorganization: On Jan. 14, 1977, pursuant to merger and corporate restructuring plan, all of the outstanding common stock of company was exchanged on a share for share basis with Houston Industries, Inc. common stock. Company's former subsidiaries became separate subsidiaries of Houston Industries in the reorganization. In accordance with Indenture dated as of Feb. 1, 1970 between Co. and Bankers Trust Co., as Trustee, Co.'s 5½% Convertible Debentures due 1985 thereupon became convertible into common stock of Houston Industries Incorporated rather than common stock of Co. Pursuant to a First Supplemental Indenture dated as of Jan. 14, 1977 among Co., Houston Industries and Trustee, Houston Industries assumed joint and several liability with Co. for payment of principal of (and premium, if any) and interest on, and to effect conversion of such Debentures. None of the other outstanding securities of Co., including preferred stock and first mortgage bonds were affected.

MANAGEMENT

Officers

D.D. Jordan, Chmn. of Bd. & Chief Exec. Off.
D.D. Sykora, Pres. & Chief Oper. Off.
H.R. Dean, Exec. Vice-Pres.
G.W. Oprea, Jr., Exec. Vice-Pres.
J.D. Cowart, Group Vice-Pres. (Admin.)
K.R. Hinckley, Group Vice-Pres. (Pers. & Public Affairs)
D.E. Simmons, Group Vice-Pres. (Sys. Eng. Oper.)
E.A. Turner, Group Vice-Pres. (Fossil Plant Eng. & Constr.)

Vice-Presidents

A.R. Beavers — R.E. Doan
R.L. Evans, Jr. — J.H. Goldberg
R.M. McCuistion — L.B. Horrigan
J.D. Greenwade — R.S. Letbetter
A.D. Maddox — J.G. DeWease
J.D. Parsons
J.R. Johnston, Sec. & Treasurer
J.S. Brian, Asst. Sec. & Asst. Treas.
F.C. Gemar, Asst. Sec. & Asst. Treas.
W.R. Brown, Gen. Counsel

Directors

Searcy Bracewell, Houston
W.R. Brown, Houston
H.R. Dean, Houston
John C. Echols, Baytown
Howard W. Horne, Houston

[illegible]D. Jordan, Houston
[illegible]mes R. Lesch, Houston
[illegible]B. McDade, Houston
[illegible]W. Oprea, Jr., Houston
[illegible]ewart Orton, Houston
D.D. Sykora, Houston
W.E. Walbridge, Houston
J.C. Wessendorff, Richmond

Auditors: Deloitte Haskins & Sells.

Purchasing Agent: B. Commander, Jr.

Advertising Manager: W.S. Secrest.

Director Meetings: First Wed. of each month.

Annual Meeting: In May.

No. of Stockholders: Dec. 31, 1981: Preferred, [illegible],259; common, 1.

No. of Employees: Dec. 31, 1981, 9,317.

General Office: 611 Walker Ave., Houston, TX 77002. **Tel.:** (713)228-9211.

Mailing Address: P.O. Box 1700, Houston, TX 77001.

BUSINESS

Engaged in generation, transmission, distribution and sale of electric energy. Territory served includes Houston, Galveston, and 156 adjacent communities and rural areas. Incident to its electric business, company sells small amount of steam to Champion International, Inc. In addition, company cooperates with dealers in sale of electric appliances to its customers.

Aggregate population of territory is estimated at approximately 3,024,000.

The service area of the Company is a major producer of oil, gas, sulphur, refined products, chemicals, petrochemicals, steel, oil tools and related manufacturing, processing and servicing activities. Electronics, paper, cement, building materials, cotton, rice, cattle, salt, magnesium and other minerals are also important products of the service area.

PHYSICAL PROPERTIES

Electric properties of the company include eleven steam generating stations with installed turbine name plate generating capacity of 11,607,502 k.w. (incl. gas turb.), 187 major substations with installed transformer capacity of 35,395,234 k.v.a. and 24,080 miles of transmission and distribution lines. Approximately 80% of Company's fuel requirements during 1981 was met with natural gas, 19% was met with coal and the balance was met with oil. Chief power plants are as follows:

Deepwater—near Houston—Constructed in 1924; last unit installed in 1955. Capacity, [illegible] k.w.; net generation (k.w.h.): 1981, 790,189,000; 1980, 573,496,000; fuel cost (natural gas) per k.w.h. (mills): 1981, 35.51; 1980, 29.88.

Gable Street—Houston—(on standby basis) Constructed in 1900; last unit installed 1950. Capacity, 53,000 k.w.; net generation (k.w.h.): 1981, (1,626,000); 1980, (2,335,000); fuel cost (natural gas) per k.w.h. (mills): 1981, N.A.; 1980, N.A.

Hiram O. Clarke—Houston—Constructed in 1948; last unit installed in 1973. Capacity, [illegible] k.w.; net generation (k.w.h.): 1981, [illegible]; 1980, 235,585,000. Fuel cost (natural gas) per k.w.h. (mills): 1981, 48.13; 1980, [illegible].

Greens Bayou—near Houston—Constructed in 1949. Last unit installed in 1973. Capacity 740,710 k.w.; net generation (k.w.h.): 1981, 2,653,100,000; 1980, 2,528,441,000; fuel cost (natural gas) per k.w.h. (mills): 1981, 31.12; 1980, 23.85.

Webster—near Webster—Constructed in 1954. Last unit installed in 1965. Capacity, [illegible] k.w. Net generation (k.w.h.): 1981, 2,510,710,000; 1980, 2,183,762,000; fuel cost (natural gas) per k.w.h. (mills): 1981, 35.15; 1980, 23.31.

Sam Bertron—near La Porte—Constructed in 1956. Last unit installed in 1960. Capacity, [illegible] k.w.; net generation (k.w.h.): 1981, [illegible]; 1980, 3,420,337,000; fuel cost (natural gas) per k.w.h. (mills): 1981, 34.44; 1980, 27.35.

W.A. Parish—near Richmond—Constructed in 1958, last unit installed in 1980. Capacity, [illegible] k.w.; net generation (k.w.h.): 1981, [illegible]; 1980, 16,216,504,000; fuel cost (natural gas and coal) per k.w.h. (mills): 1981, 27.77; 1980, 22.56.

T.H. Wharton—near Houston—Constructed in 1958, last unit installed in 1960. Capacity, 286,000 k.w.; net generation (k.w.h.): 1981, 449,882,000; 1980, 1,328,831,000; fuel cost (natural gas) per k.w.h. (mills): 1981, 36.11; 1980, 29.21.

P.H. Robinson—near Bacliff—Constructed in 1966, last unit installed in 1973. Capacity, 2,177,694 k.w.; net generation (k.w.h.): 1981, 11,584,827,000; 1980, 13,193,277,000; fuel cost (natural gas) per k.w.h. (mills): 1981, 24.19; 1980, 19.70.

Cedar Bayou—near Baytown—constructed 1970. Last unit installed in 1974. Capacity, 2,093,800 k.w. Net generation (k.w.h.): 1981, 12,792,830,000; 1980, 13,073,113,000; fuel cost (natural gas) per k.w.h. (mills): 1981, 29.66; 1980, 19.96.

Gas Turbine Generating Units—Installed in 1967, 1968, 1972, 1974, 1975 and 1976 in various locations. Capacity 1,479,504 k.w.; net generation (k.w.h.): 1981, 4,309,614,000; 1980, 4,284,208,000.

Construction Program: Company estimates construction program will entail expenditures of approximately $767,000,000 in 1982, $1,120,000,000 in 1983, and $1,260,000,000 in 1984. Program includes construction of one 600,000 k.w. coal-fired steam unit at W.A. Parish plant scheduled for service in 1983; two 385,000 k.w. nuclear units at South Texas Project representing Co.'s portion of the two 1,250,000 k.w. units scheduled for service in 1987 and 1989; two 750,000 k.w. lignite-fired units known as the Limestone Electric Generating Station, to be located 18 miles southeast of Groesbeck; first unit scheduled for completion in 1986 and second in 1987; two 750,000 k.w. lignite-fired units known as the Malakoff Electric Generating Station, to be located approximately 200 miles north of Houston near the town of Malakoff; first unit scheduled for operation in 1988; the second in 1989. The Company is currently re-evaluating its planned construction of the 12,000 k.w. Allens Creek nuclear plant.

FRANCHISES

Corporate existence of the company was limited by charter to 50 years from January 9, 1906, but could be extended another 50 years at any time within 10 years of expiration by majority vote of stockholders provided company was solvent and capital unimpaired. In 1951, stockholders authorized an extension of corporate existence of company to Jan. 8, 2006. Amendment of company charter in April 1959 provided for perpetual corporate existence. Company holds a 50-year franchise from each of the 84 incorporated communities served, none of which expire before 2007. All 50-year franchises provide for payment annually by company to respective municipalities of a nominal sum of $500 plus 4% of company's gross receipts for preceding year from electric sales (other than street lighting) within corporate limits of respective municipalities. All franchises are nonexclusive.

REGULATION

Since Sept. 1976, Co.'s rates and services have been subject either to original or appellate jurisdiction of Public Utility Commission of Texas (Utility Commission). Prior to that time, its rates and services were subject to regulation only by incorporated municipalities it serves. Under Texas Public Utility Regulatory Act which created Utility Commission, each municipality may continue to exercise original jurisdiction over electric utilities operating within its borders or, by ordinance or voter referendum, may surrender its original jurisdiction to Utility Commission. If a municipality does not surrender its original jurisdiction, it may continue to exercise regulatory powers under same standards and rules as those applied by Utility Commission, or under such other standards and rules as are not inconsistent with those of Utility Commission. Sales by Co. over which Utility Commission presently has original jurisdiction accounted for approx. 46% of Company's operating revenues for twelve months ended Dec. 31, 1981.

RATES AND SERVICES

Pursuant to the Texas Public Utility Regulatory Act which was passed in June 1975, the Public Utility Commission of Texas (Utility Commission) has assumed original jurisdiction over electric rates and services in unincorporated areas of the State, and in a number of cities that have relinquished original jurisdiction. In addition, the Utility Commission has appellate jurisdiction over electric rates and services within the remaining incorporated revenues and KWH sales.

In July 1981, HL&P filed applications for general rate increases with the Utility Commission and with the 76 incorporated municipalities that had original jurisdiction over HL&P's rates and services. In its applications, HL&P requested an increase in its base operating revenues for an adjusted test year ended March 31, 1981 of $248 million, a 17.0% return on common equity and inclusion in rate base of approximately $990 million (73%) of its $1,357 million investment in construction work in progress and nuclear fuel in process. In October 1981, as a result of a settlement between HL&P, the staff of the Utility Commission and various intervenors, the Utility Commission authorized new rates designed to increase HL&P's system-wide annual revenues for the adjusted test year by approximately $189 million and to provide a return on common equity of 16.25%, with inclusion in rate base of all of the $990 million of construction work in progress and nuclear fuel in process requested by HL&P. The new rates became effective for service used on and after October 15 for all unincorporated areas and certain cities covered by the Utility Commission's order which together account for approximately 50% of HL&P's revenues. A number of cities, including Houston, issued rate ordinances authorizing smaller increases in electric rates which HL&P subsequently appealed to the Utility Commission. The Utility Commission approved rates are being collected in these cities, subject to refund, pending the outcome of public hearings scheduled for April 1982.

On Sept. 15, 1980, the Utility Commission granted an increase of $135 million on an adjusted test year ended March 31, 1980. HL&P had requested $214 million. The final order issued by the Utility Commission was based upon a settlement agreement entered into by HL&P, the Utility Commission staff and the major intervenors in the case. The final order provided for the inclusion of $677 million or 72% of construction work in progress and nuclear fuel in process in rate base and granted a 15.8% return on common equity. The Company had requested 85% of construction work in progress and nuclear fuel in process in the rate base.

RESIDENTIAL RATES

Electric: (all areas).

Effective date: Oct. 1981, $6.00 (minimum bill) incl. first 30 kwh.

Months of May through Oct.:

3.845¢ per kwh for all additional kwh; however, if aggregate usage in any of these months is less than 750 kwh the Nov. through April rate will apply

Months of Nov. through April:

2.345¢ per kwh for all addit. kwh

COMPETITION

Territory served by company is near the projects constructed by the Lower Colorado River Authority but service areas are clearly defined for both company and the Authority. For details see blue insert; also contract for sale and interchange of power.

Company has made no representation as to possible future effects of the program of the Rural Electrification Administration created by the Federal Government.

The Public Utility Commission, under the authority granted it by the Public Utility Regulatory Act, has established the service area boundaries of the Company.

CONTRACT

HL&P has contracted with the City of Austin, Texas to purchase up to 800 megawatts of Austin's generating capacity through 1987. HL&P has also contracted with the City Public Service Board of San Antonio to purchase varying amounts of capacity during the years 1982 through 1987, ranging from 200 to 500 megawatts.

In conjunction with the Austin agreement, Company entered into an agreement with the Lower Colorado River Authority to transmit the power purchased from the City of Austin. The transmission services started on Jan. 1, 1980 and will end December 31, 1985.

STATISTICS

OPERATING STATISTICS, YEARS ENDED OR ON DEC. 31

(Taken from reports to Federal Energy Regulatory Commission)

ELECTRIC	1981	1980	1979	1978	1977	1976	1975
Population of area served	3,024,000	2,885,690	3,096,000	2,900,000	2,721,000	2,625,000	2,520,000
Customers:							
Residential	982,035	909,016	849,319	778,850	706,269	663,095	623,865
Commercial & industrial	135,573	125,931	118,896	112,572	103,468	95,909	89,653
Other	76	76	76	87	83	81	77
Total	1,117,684	1,035,023	968,281	891,509	809,820	759,085	713,595
K.w.h. Sales:							
Residential & rural	12,917,958,000	12,566,096,938	11,078,887,101	10,956,913,791	9,759,136,999	8,529,177,260	8,427,429,212
Commercial & industrial	40,466,304,000	38,997,228,270	38,123,175,176	36,377,530,457	33,382,661,791	29,735,561,515	27,470,403,149
Other	3,496,102,000	3,240,294,006	3,158,440,331	2,941,322,283	2,743,925,970	2,593,961,609	2,248,716,342
Total	56,880,364,000	54,803,619,214	52,360,502,608	50,275,766,531	45,885,724,580	40,858,700,384	38,146,548,703

STATISTICS (Cont'd):

	1981	1980	1979	1978	1977	1976	1975
Revenues:							
[1]Residential & rural	$812,414,077	$628,599,064	$453,354,216	$367,729,764	$301,824,360	$241,583,076	$200,515,58[illegible]
Commercial & industrial	1,822,369,349	1,387,906,010	1,140,715,305	867,331,661	707,901,942	556,182,050	399,394,56[illegible]
Other	134,431,796	107,451,810	85,531,921	60,967,951	50,852,654	39,402,479	27,816,2[illegible]
Total	$2,769,215,222	$2,123,956,884	$1,679,601,442	$1,296,029,376	$1,060,578,957	$837,167,605	$627,726,3[illegible]
K.w.h. generated (net)	57,165,347,000	57,228,126,000	54,678,417,000	53,101,474,000	48,534,625,000	43,353,203,000	40,276,0[illegible]
K.w.h. purchased	2,448,306,000	720,293,000	377,387,000	222,670,000	325,000	640,000	599,[illegible]
System peak load k.w.	10,540,000	10,266,000	9,602,000	9,362,000	8,645,000	8,219,000	7,465,[illegible]
SALARIES AND WAGES:							
Electric	$140,321,239	$118,743,648	$102,862,737	$78,151,579	$69,244,390	$53,287,229	$50,871,5[illegible]
Utility plant	53,026,367	42,811,250	38,441,531	30,465,964	27,842,296	21,579,863	24,037,[illegible]
Other	20,395,684	14,370,741	12,112,457	7,190,437	5,193,131	2,861,070	3,102,2[illegible]
Total	213,743,290	$175,925,639	$153,416,725	$115,807,980	$102,279,817	$77,728,162	$78,011,6[illegible]

[1]Residential only.

INCOME ACCOUNTS

COMPARATIVE INCOME ACCOUNT, YEARS ENDED DEC. 31
(Taken from reports filed with the Securities and Exchange Commission)
(in thousands of dollars)

	1981	1980	1979	1978	1977	1976	1975
Total operating revenue (electric)	2,769,215	2,123,957	1,707,527	1,303,604	1,069,786	841,616	634,15[illegible]
Operating expenses	1,940,606	1,440,334	1,137,102	823,849	633,244	449,876	323,50[illegible]
Maintenance	117,205	97,598	77,703	55,354	43,719	33,344	36,45[illegible]
Depreciation	115,411	101,134	93,448	73,261	63,792	57,030	51,0[illegible]
Amort. of limited term util. invest.	19	19	19	19	19	19	[illegible]
Amort. of prop. losses	3,044	2,618	278	......	......	......	......
Federal taxes:							
Income	44,168	26,233	10,911	10,229	19,194	37,601	19,45[illegible]
Deferred income taxes	61,049	59,811	44,515	37,831	30,879	24,782	19,94[illegible]
Investment tax credit	60,764	44,414	56,726	46,665	44,944	26,195	12,07[illegible]
Other taxes	10,167	7,430	6,054	4,736	3,620	2,996	3,2[illegible]
State and local taxes	80,160	73,426	63,915	55,436	47,815	44,368	39,34[illegible]
Total oper. revenue deductions	2,432,593	1,853,017	1,490,671	1,107,370	887,226	676,211	505,1[illegible]
Net operating revenue	336,622	270,940	216,901	196,234	182,560	165,405	129,0[illegible]
[1]Allow. for funds used during constr.	......	......	......	......	......	16,384	8,5[illegible]
[1]Allow. for other funds used during constr.	39,058	32,735	31,928	17,029	14,088	......	......
Other income	3,692	4,682	914	4,271	1,865	1,450	1,0[illegible]
Gross income	379,372	308,357	249,743	217,534	198,513	183,239	138,65[illegible]
Interest on long term debt	146,513	122,695	101,566	84,307	71,799	61,098	56,91[illegible]
Amortiz.—debt disc. & exp. (net)	380	153	45	cr21	cr9	cr30	cr[illegible]
[1]Allow. for borrowed fds. used during constr.	cr11,470	cr9,619	cr10,911	cr11,639	cr9,821	......	......
[2]Tax alloc. of AFUDC	cr9,770	cr8,194	cr9,294	......	......	......	......
Other interest charges	7,388	5,159	2,136	5,208	2,293	6,867	11,2[illegible]
Other deductions	1,129	808	485	300	127	148	[illegible]
Total income deduction	134,170	111,002	84,027	78,155	64,389	68,083	68,2[illegible]
Net income	245,202	197,356	165,716	139,379	134,124	115,156	70,3[illegible]
Retained earnings, beg. of year	691,489	620,034	553,213	497,079	429,550	368,656	339,4[illegible]
Total credits	936,691	817,390	718,928	636,458	563,674	483,812	409,[illegible]
Preferred dividends	20,042	20,042	19,765	17,330	13,711	12,362	6,4[illegible]
Common dividends (stock)	137,954	105,859	79,129	65,915	52,884	41,900	34,[illegible]
Retained earnings, Dec. 31	778,695	691,489	620,334	553,213	497,079	429,550	368,6[illegible]

[1]Effective Jan. 1, 1977, Federal Power Commission, predecessor of Federal Energy Regulatory Commission (which does not have jurisdiction over Co. or its rates), issued an order which provides a formula for computing a maximum allowable AFC rate and requires reclassification of AFC into a "borrowed funds" and an "other funds" component. Since Jan. 1, 1977 accrual of AFC has been reclassified for income statement presentation to show such components.

[2]Prior to Jan. 1979, deferred income taxes were not recognized on the interest component of AFUDC which is deducted currently for federal income tax purposes.

Statement of Changes in Financial Position (in $000):

Source of Funds:	1981	1980
Net income	245,202	197,356
Depreciation	125,329	108,298
Deferred inc. taxes—net	51,280	51,617
Inv. tax credit def. net	53,130	44,414
Funds used during constr. (cr.)	(50,528)	(43,354)
Sale of first mtge. bonds	125,000	100,000
Sale of com. stk.	162,925	172,465
[1]Sale of poll. contr. bds.	96,260	5,000
Chge. in notes pay. & temp. cash invest.	(29,292)	101,915
Recl. to curr. mat. of lg. tm. debt	......	(20,00[illegible]
Other—net	(24,001)	1,7[illegible]
Total	755,305	720,4[illegible]
Application of Funds:		
Prop. add. (net of allow. for funds used dur. constr.)	643,762	63[illegible]
Dividends	157,996	125,90[illegible]
Total	801,758	762,55[illegible]
[2]Incr. in Working Capital	d46,453	d42,1[illegible]

[1]Net of proceeds held by Trustee.
[2]Excl. notes payable & temporary cash invest.

Record of Earnings, years ended Dec. 31 (in thousands of dollars):

	Oper. Revenues	Oper. Expenses	Maintenance	Depreciation	Taxes	Net Oper. Revenue	Gross Income	Income Deduct.	Net Income	Common Divs.	[1]No. of Com. Shs.	[1]Earn. per Com. Sh.
1975	634,153	323,502	36,455	51,091	94,099	129,004	138,654	68,269	70,385	34,713	23,752,127	2.69
1974	486,837	212,406	31,217	45,146	89,022	109,044	118,277	48,399	69,878	32,628	21,752,127	2.94
1973	409,060	158,061	29,091	39,224	85,062	97,620	106,586	34,677	71,909	29,928	21,752,127	3.04
1972	363,640	129,636	28,187	34,969	79,825	91,023	98,045	32,372	65,673	27,543	20,252,127	3.10
1971	317,794	113,158	21,378	30,936	69,839	82,483	86,975	27,489	59,486	26,125	20,252,127	2.84
1970	282,752	99,605	21,744	27,760	61,841	71,802	77,131	23,280	53,851	24,303	20,252,127	2.56
1969	262,534	88,007	17,020	26,203	65,559	65,745	68,404	20,454	47,949	22,682	20,252,127	2.2[illegible]
1968	235,529	79,628	16,507	23,149	57,922	58,323	61,211	18,406	42,805	22,075	20,252,127	2.06
1967	206,133	71,113	14,110	20,463	48,021	52,425	55,276	14,481	40,795	20,252	20,252,127	2.00
1966	190,999	64,165	10,904	18,714	47,424	49,792	50,184	9,081	41,103	20,252	20,252,127	2.01
1965	180,220	57,950	9,055	17,434	47,388	48,393	48,864	8,132	40,731	18,632	20,252,127	1.99
1964	166,100	53,977	10,036	16,407	43,628	42,052	42,707	7,918	34,789	15,797	20,252,127	1.70
1963	155,193	49,906	7,584	15,719	42,838	39,146	39,588	8,086	31,502	13,974	20,252,127	1.54
1962	141,649	45,436	6,774	15,261	38,786	35,577	35,843	8,456	27,397	11,476	6,750,709	4.0[illegible]
1961	120,497	39,182	5,913	14,642	30,814	29,946	29,976	8,444	21,532	10,801	6,750,709	3.13
1960	115,837	36,640	5,459	13,309	30,352	30,073	30,101	7,618	22,483	10,801	6,750,709	3.2[illegible]
1959	104,675	32,484	5,084	11,904	27,915	27,288	27,324	6,401	20,923	10,801	6,750,709	3.04
1958	94,362	28,976	4,663	10,102	25,577	25,043	25,312	5,104	20,208	10,801	6,750,709	2.94
1957	87,102	26,978	4,748	8,785	23,713	22,879	23,026	4,079	18,947	10,244	6,750,709	2.7[illegible]

[1]Does not reflect 3-for-2 stock split effective May 26, 1981.

BALANCE SHEETS

COMPARATIVE BALANCE SHEET, AS OF DEC. 31
(Taken from reports filed with the Securities and Exchange Commission)
(in thousands of dollars)

ASSETS	1981	1980	1979	1978	1977	1976	1975
Electric plant	5,107,441	4,455,713	3,816,988	3,316,468	2,887,930	2,462,603	2,175,[illegible]
Depreciation reserve	777,203	678,717	591,465	512,604	450,946	396,417	34[illegible]
Nuclear fuel	121,683	104,947	83,947	69,995	61,291	32,109	1[illegible]
Net utility plant	4,451,921	3,881,943	3,309,470	2,873,859	2,498,275	2,098,295	1,843,[illegible]

BALANCE SHEETS (Cont'd):	1981	1980	1979	1978	1977	1976	1975
Other physical property	......	......	......	......	......	26	9
Cash	9,747	11,840	11,614	10,051	11,563	9,995	12,704
Temporary cash investments	......	......	52,129	68,664	......	......	......
Special deposits	8,838	4,937	4,927	4,253	3,683	3,243	3,384
Working funds	290	440	339	391	270	212	167
Accounts and notes receivable (net)	126,144	102,885	82,207	85,812	62,611	62,559	39,826
Materials and supplies	129,656	97,544	79,139	70,945	69,439	77,143	83,998
Prepayments	3,119	2,934	14,046	2,192	2,727	2,749	1,565
Total current and accrued assets	277,794	220,580	244,401	242,308	150,293	155,927	141,653
Miscellaneous deferred debits	66,937	48,786	43,111	24,662	19,695	9,842	4,612
Total assets	4,796,652	4,151,309	3,596,982	3,140,829	2,668,263	2,264,064	1,989,786
LIABILITIES							
Common stock	923,666	760,741	588,276	456,758	391,534	324,094	258,688
Preferred stock	243,518	243,518	243,518	213,945	214,000	163,847	124,482
Retained earnings	778,695	691,489	620,034	553,213	497,079	429,550	368,656
Total stockholders' equity	1,945,879	1,695,748	1,451,828	1,223,916	1,102,613	917,490	751,826
Mortgage debt	1,610,000	1,505,000	1,405,000	1,280,000	1,055,000	930,000	805,000
Other long-term debt	138,460	42,200	37,200	34,926	18,000	18,000	18,000
Conv. debenture	40,000	40,000	40,000	40,000	40,000	40,000	40,000
Total long-term debt	1,788,460	1,587,200	1,482,200	1,354,926	1,113,000	988,000	863,000
Notes payable	21,578	50,870	1,084	2,197	* 24,829	6,304	131,866
Curr. portion l.t. debt	......	20,000	......	......	......	......	......
Accounts payable	236,532	142,851	126,646	115,389	79,810	70,784	39,033
Customer deposits	18,148	11,542	9,008	6,364	6,321	4,908	4,494
Taxes accrued	51,809	44,245	27,278	33,571	24,430	43,039	32,160
Interest accrued	37,269	29,324	28,086	26,844	22,309	20,557	18,933
Other current liabilities	69,591	61,720	48,227	42,004	31,674	25,753	19,468
Total current and accrued liabilities	434,927	360,552	240,329	226,369	189,373	171,345	245,954
Customers advances for construction	17,198	22,121	18,578	19,103	19,563	15,050	9,128
Accum. def. investment tax credits	289,575	235,791	192,606	145,452	106,589	67,660	42,931
Other deferred credits	3,379	cr19,732	cr1,747	704	2,105	2,716	87
Unamortized premium on debt, net	cr8,470	cr6,005	cr2,200	cr959	cr274	cr453	81
Total deferred credits	301,682	232,175	207,237	162,892	127,983	84,973	52,227
Accum. deferred income taxes	317,584	267,249	206,569	163,818	126,940	94,511	69,729
Injuries and damages reserve	......	......	450	408	354	244	50
Other reserves	8,120	8,385	8,369	8,500	8,000	7,500	7,000
Total liabilities	4,796,652	4,151,309	3,596,982	3,140,829	2,668,263	2,264,064	1,989,786
Net current assets	d157,133	d139,972	4,072	15,939	d39,080	d15,418	d104,301

Due to accelerated amortization and liberalized depreciation.

Represented by no par shares:
$4 series: 1974-80, 97,397 shares.
$6.72 series: 1973-79, 250,000 shares.
$7.52 series: 1973-79, 500,000 shs.
$9.52 series: 1975-79, 400,000 shs.
$9.08 series: 1976-79, 400,000 shs.
$8.12 series: 1977-79, 500,000 shs.
$9.04 series: 1979, 300,000 shs.

Represented by no par shares: 1981, 74,081,841; 1980, 42,964,777; 1979, 36,217,276; 1978, 31,314,966; 1977, 29,004,642; 1976, 26,752,127; 1975, 23,752,127.

Notes: (a) Prior to May 14, 1943, company was a subsidiary of a public utility holding company and subject to the provisions of the Public Utility Holding Company Act of 1935. On that date company ceased to be such subsidiary. Company, while such a subsidiary, was required to adopt FERC Uniform System of Accounts pursuant to Securities and Exchange Commission Rule U-27, promulgated under P.U.H. Act of 1935. Subsequent to May 14, 1943, company generally follows FERC Uniform System of Accounts and files reports with FERC but expressly denies jurisdiction of FERC over facilities owned by company or the right of FERC to require reports in connection therewith. Company in 1945 completed a study and reclassification of plant, property and equipment (including intangibles). The reserve previously designated as amortization, depreciation, renewals and replacement reserve was subdivided to correspond with related assets accounts and effective Jan. 1, 1945, company instituted straight-line depreciation accounting, annual provisions being approximately 3% of total depreciable cost of electric plant.

(b) Deferred Federal Income Taxes: After 1969, Co. began using liberalized depreciation method for federal income tax purposes. Co. uses tax guideline lives for property acquired before 1971, and elected to adopt federal income tax "class life system" for 1973-72 property additions. Pursuant to the Economic Recovery Tax Act of 1981, the ACRS method is used for post 1980 properties. Deferred income taxes have been provided on difference between depreciation computed using these methods and straight-line tax depreciation otherwise allowable.

Investment tax credit applied as a reduction of federal income taxes has been deferred and is being amortized over estimated lives of related property. Credits deferred aggregated $60,764,000 in 1981 and $44,414,000 in 1980.

Auditor's Report: The following is an excerpt from the Report of Independent Auditors, Deloitte Haskins & Sells, as it appeared in 1981 Annual Report.

"As discussed in Note 7, the Company recently began a re-evaluation of its Allens Creek nuclear generating facility. Certain alternatives under consideration could result in substantial unrecoverable costs, but the ultimate outcome cannot be determined at this time. In our report dated February 16, 1981, our opinion on the 1979 and 1980 financial statements was unqualified; however, in view of the matter referred to above, our present opinion on such financial statements, as expressed herein, is different from that expressed in our previous report.

In our opinion, subject to the effects on the financial statements of such adjustments, if any, as might have been required had the outcome of the uncertainty referred to in the preceding paragraph been known, such financial statements present fairly the financial position of the Company at December 31, 1980 and 1981 and the results of its operations and the changes in its financial position for each of the three years in the period ended December 31, 1981, in conformity with generally accepted accounting principles applied on a consistent basis.

Our examinations also comprehended the supplemental schedules V, VI, VIII and IX for each of the three years in the period ended December 31, 1981. In our opinion, subject to the effects on Schedule V of such adjustments, if any, as might have been required had the outcome of the uncertainty referred to in the second preceding paragraph been known, such supplemental schedules, when considered in relation to the basic financial statements, present fairly in all material respects the information shown therein."

FINANCIAL & OPERATING RATIOS

(Ratios and data compiled from reports to Federal Energy Regulatory Commission)

ELECTRIC OPERATIONS	1981	1980	1979	1978	1977	1976	1975
Ratio pop. to res. cust.	3.08	3.17	3.65	3.72	3.85	3.96	4.04
Res. sales % of total	22.71	22.93	21.16	21.79	21.27	20.87	22.09
Res. revs. % of total	29.33	29.60	26.99	28.37	28.46	28.90	31.94
Res. av. rate per k.w.h.—cents	6.29	5.00	4.09	3.36	3.09	2.8	2.4
Res. aver. cust. use (k.w.h.)	13,590	14,219	13,522	14,734	14,266	13,146	13,508
INCOME ACCOUNT							
% Deprec. of gross oper. rev.	4.3	4.9	5.5	5.6	6.0	6.8	8.1
% Maintenance of gr. oper. revenue	4.2	4.6	4.55	4.25	4.09	3.96	5.7
% Deprec. of utility plant	2.3	2.3	2.5	2.2	2.2	2.3	2.3
% Net oper. rev. to net util. plant	7.6	7.0	6.6	6.8	7.3	7.9	7.0
Operating ratio	81.85	81.10	80.73	77.68	74.05	69.9	71.5
Times chgs. earned before inc. taxes	3.6	3.56	3.68	3.62	4.09	4.00	2.84
Times chgs. earned after inc. taxes	2.52	2.54	2.60	2.56	2.81	2.69	2.03
Times chgs. & pfd. div. earned aft. inc. tax.	2.23	2.20	2.18	2.14	2.37	2.28	1.86
Earned per share preferred	$100.19	$80.64	$68.38	$64.91	$78.35	$71.43	$56.43
Earned per share com. (year end shs.)	$3.04	$4.13	$4.03	$3.90	$4.15	$3.84	$2.69
Earned per sh. com. (yr. end)—adj.	$3.04	$2.75	$2.69	$2.60	$2.77	$2.56	$1.79
Earned per share common (avg.)	$3.26	$4.52	$4.34	$3.97	$4.21	$3.92	$2.89
Earned per sh. com. (avg.)—adj.	$3.26	$3.01	$2.89	$2.65	$2.81	$2.61	$1.93
Net tang. per common share (actual)	$23.00	$33.80	$33.36	$32.25	$30.64	$28.58	$28.25
Net tang. assets per sh.—adj.	$23.00	$22.53	$22.24	$21.50	$20.43	$19.05	$18.83
Number of shares—$4 preferred	97,397	97,397	97,397	97,397	97,397	97,397	97,397
—$6.72 preferred	250,000	250,000	250,000	250,000	250,000	250,000	250,000
—$7.52 preferred	500,000	500,000	500,000	500,000	500,000	500,000	500,000
—$9.52 preferred	400,000	400,000	400,000	400,000	400,000	400,000	400,000
—$9.08 preferred	400,000	400,000	400,000	400,000	400,000	400,000	......
—$8.12 preferred	500,000	500,000	500,000	500,000	500,000	......	......
—$9.04 preferred	300,000	300,000	300,000	......	......	......	......
—Com. (avg.)	69,053,418	39,247,183	33,631,032	30,748,381	28,621,146	26,752,127	22,097,000
—Com. (avg.)—adj.	74,001,841	55,870,774	50,446,548	46,122,572	42,931,719	40,128,190	33,145,500

FINANCIAL RATIOS (Cont'd):	1981	1980	1979	1978	1977	1976	1975
—com. (year end)	74,001,841	42,964,777	36,217,276	31,314,996	29,004,642	26,752,127	[illegible]
—com. (year end)—adj.	69,053,418	64,447,166	54,325,914	46,972,494	43,506,963	40,128,190	[illegible]
BALANCE SHEET							
% of total capitalizat. represented by:							
Common stock & surplus	45.6	44.5	41.2	39.2	40.1	39.5	[illegible]
Preferred stock	6.5	7.5	8.3	8.3	9.7	8.6	[illegible]
Long term debt	47.9	48.0	50.5	52.5	50.2	51.9	[illegible]
% Mtge. debt of deprec. plant	37.2	39.9	43.6	45.7	44.6	47.1	[illegible]
Ratio gross plant to gross revs.	1.84	2.10	2.23-1	2.54-1	2.70-1	2.93-1	[illegible]
% deprec. res. to gross plant	15.23	15.24	15.5	15.5	15.6	16.1	[illegible]
PRICE RANGE							
First 3s, 1989	51-45⅞	55-45	63⅜-56	60⅞-57⅞	62.428-54⅝	62½-54	[illegible]
First 3¼s, 1986	66¾-62⅝	67-57	71⅝-66¼	70⅞-67	72-66¾	71⅝-62	[illegible]
First 4¾s, 1987	63¾-59⅛	68-58	75¼-67⅞	77⅞-68½	78¼-72	75¾-70	[illegible]
First 4⅞s, 1989	58-52¾	64-53	73⅝-65¼	74-57	76-72¾	76½-66	[illegible]
First 4½s, 1992	48⅝-42	55-43	64¾-56¼	66⅞-61	69½-64⅞	70½-59	[illegible]
First 5¼s, 1996	47⅜-39½	55¾-42	60¾-57⅛	70-62¾	71⅝-68⅛	72-65	[illegible]
First 5¼s, 1997	46½-38¾	54¾-41	65¾-56½	69½-61¾	72-70	74¼-65	[illegible]
First 6¾s, 1997	55⅜-46	63¾-50	77⅛-66½	83½-74	85¼-81⅞	88⅝-78	[illegible]
First 6¾s, 1998	55⅛-45¾	63¾-50	77-66¼	83½-73¾	85½-81⅝	86¼-78½	[illegible]
First 7½s, 1999	58¾-49½	68¾-55	83⅞-70⅞	90½-80	93½-87⅞	98¼-85	[illegible]
First 7¼s, 2001	56¼-47¼	67½-53	81-68½	86¾-77	90½-8[illegible]½	92¼-82	[illegible]
First 7½s, 2001	57⅝-48⅝	69½-54	83⅛-69⅞	89¼-79	91¼-86	92-84	[illegible]
First 8⅛s, 2004	61-51½	79-58	88¾-73⅞	95¼-84¼	98⅛-92⅛	101¼-90	[illegible]
First 10⅛s, 2004	73¼-62⅛	90½-72	104¾-88½	109⅞-101¼	111½-107¼	114-104	[illegible]
First 8¾s, 2005	64⅞-54⅝	81-62	93¾-78	100-90	103¾-99⅝	105-95	[illegible]
First 8¾s, 2006	62¼-52½	76½-59	90¼-75¼	98¼-86	102-98.115	102¾-96	......
First 8¾s, 2007	62-52⅝	76-58	90⅞-75	98¼-86	100¾-98.100	......	......
First 8⅞s, due 2008	65-54¾	79½-62	94¾-78⅝	100-95⅝	......	......	......
First 9¼s, due 2008	67⅜-56¾	82½-65	98-80¾	99½-97⅝	......	......	......
First 11¼s, due 2009	79⅝-67⅞	105⅞-78½	96½-96½	......	......	......	......
First 12s, due 2010	83⅜-71¾	105-82	......	......	......	......	......
First 13⅞s, due 1991	97½-88⅜	......	......	......	......	......	......
$4 cum. preferred	30⅛-25¾	43¼-29¼	44¾-35¾	43-37	49-45	48½-41⅝	[illegible]
$6.72 cum. preferred	50¾-43⅜	72⅝-49	75-60	......	85¼-81	84-73	[illegible]
$7.52 cum. preferred	56¾-48½	81¼-54⅞	84-67⅛	92¼-92¼	95¾-92¼	91⅛-82¼	[illegible]
$9.52 cum. preferred	71⅞-61⅜	102⅞-69½	106⅜-85	......	112-107	110-101⅛	[illegible]
$9.08 cum. preferred	68½-58½	98⅛-64¼	101½-81	99-99	109¾-101	108½-99½	......
$8.12 cum. preferred	61¼-52⅜	87⅞-59¼	90¾-72½	100-97½	99¾-99⅝	......	......
$9.04 cum. preferred	68¼-58⅜	97¾-66	101-80¾	......	......	......	......

[1]Residential only.

Additional Miscellaneous Ratios and Data (Compiled from Uniform Statistical Reports):

	1981	1980	1979	1978	1977	1976	1975
Financial Ratios							
Gross inc. % long term debt	30.4	27.9	24.4	23.0	26.4	27.5	[illegible]
Margin of safety—%	14.8	15.4	16.3	18.0	21.4	24.2	[illegible]
% of rev. available for common	8.1	8.3	8.6	9.4	11.3	12.2	[illegible]
Dividend payout—%	61.2	59.7	54.2	54	44	41	[illegible]
Avg. annual yield—%	10.4	[1]9.5	[1]8.2	[1]7.0	[1]5.7	6.1	[illegible]
Avg. times earnings	5.9	[1]6.2	[1]6.7	[1]7.6	[1]7.8	6.8	[illegible]
Miscellaneous							
Fuel cost—% of rev.	57.0	56.8	56.11	52.34	48.4	42.0	[illegible]
System capacity, Kw (000)	11,763	11,763	11,193	10,828	10,427	9,791	[illegible]
System peak, Kw (000)	10,540	10,266	9,602	9,362	8,645	8,219	[illegible]
Load factor %	60	62	65	65	64	60	[illegible]
Heat rate (BTU per kwh)	10,222	10,284	10,285	10,223	10,154	10,042	[illegible]
Fuel—avg. cost per mcf	2.89	2.16	1.75	1.30	1.09	0.84	[illegible]
Fuel—avg. cost per bbl.	18.31	16.63	11.53	12.16	11.48	10.14	[illegible]
Fuel—avg. cost per ton (coal)	42.00	......	......	......	......	......	......
Employees	9,317	8,768	7,970	7,252	6,500	5,900	[illegible]
Employees per $1 million rev.	3.36	4.13	4.68	5.56	6.08	7.01	[illegible]

[1]Based on Houston Industries Incorporated shares outstanding. [2]Adjusted for 3-for-2 stock split effective May 26, 1981.

LONG-TERM DEBT

1. Houston Lighting & Power Co. first 2¾s, due 1985:

Outstanding, this series, Dec. 31, 1981, $30,000,000; sold privately in Apr., 1950. Proceeds used to refund first mortgage bonds and balance for construction expenditures.

Dated Apr. 1, 1950; due Apr. 1, 1985; interest payable A&O1; Texas Commerce Bank N.A., Houston, trustee.

Callable as a whole or in part on at least 30 days' published notice at any time to Mar. 31, 1951 at 104.13, premium decreasing annually to par after Mar. 31, 1984; and for sinking fund on like notice to Mar. 31, 1951 at 101.13, premium decreasing annually to par after Mar. 31, 1984.

Security and other provisions same as 3s, 1989, below.

2. Houston Lighting & Power Co., first 3s, due 1989:

Rating—A 1

AUTHORIZED—Unlimited; outstanding, 1989 series, Dec. 31, 1981, $30,000,000.

DATED—Mar. 1, 1954.

MATURITY—Mar. 1, 1989.

INTEREST—M&S1 at office of trustee or Morgan Guaranty Trust Co., New York.

TRUSTEE—Texas Commerce Bank N.A., Houston.

DENOMINATION—Coupon, $1,000; registerable as to principal; fully registered $1,000 or authorized multiples thereof. C&R interchangeable.

CALLABLE—As a whole or in part on 30 days' notice at any time to the last day of each Feb., incl., as follows:

1982 .....100.71 1983 .....100.63 1984 .....100.55
1985 .....100.62 1986 .....100.46 1987 .....100.31
1988 .....100.20 1989 .....100.00

Also callable on like notice as above for sinking or improvement fund (which see), or replacement fund, or with certain deposited cash, at special prices to the last day of each Feb., incl., as follows:

1982 .....100.71 1983 .....100.63 1984 .....100.55
1985 .....100.47 1986 .....100.38 1987 .....100.29
1988 .....100.20 1989 .....100.00

SINKING OR IMPROVEMENT FUND—Annually beginning 1957, in cash or 1989 series bonds or with property additions at 60%, equal to 1% of greatest amount of 1989 series bonds at any one time outstanding, less certain bonds retired. Requirement may not be anticipated.

REPLACEMENT FUND—Annual expenditure for replacements, etc. of $1,450,000 plus 2½% of net additions to depreciable mortgaged property made after Mar. 31, 1948 and prior to July 1 of preceding year. Requirement may be met with cash, bonds, gross property additions, expenditures for repairs, etc. or by taking credit for property additions as certified under the mortgage.

SECURITY—Secured equally and ratably with other series outstanding by first lien on entire property now owned or hereafter acquired, except cash, securities not specifically pledged, materials and supplies, receivables, contracts, rights and royalties. Mortgage provides for release of property made subject to the mortgage or already subject thereto unless such property was owned at Oct. 31, 1944, or made the basis of bonds issued or a credit under the mortgage.

ADDITIONAL BONDS—Of this or other series ranking equally as to lien may be issued (1) for 60% of cost or fair value of net property additions (as defined); (2) for principal of bonds retired and (3) for cash deposited provided net earnings are at least twice annual interest requirements on all bonds outstanding and to be issued except that no earnings test is required to refund prior liens and such test is required to refund bonds under the mortgage only as specified. Company may acquire property subject to liens and company may issue bonds under the mortgage on the basis of such property as provided.

RIGHTS UPON DEFAULT—In event of default (60 day grace period for payment of interest and sinking fund), trustee or holders of 25% of bonds may declare bonds due and payable.

INDENTURE MODIFICATION—Indenture may be modified with consent of 70% of bonds.

PURPOSE—Proceeds for construction.

OFFERED—($30,000,000) at 102.189 (proceeds to company 101.529999) on Mar. 2, 1954 by Halsey, Stuart & Co., Inc., Chicago, and associates.

3. Houston Lighting & Power Co. first 3¼s, due 1986:

Rating—A 1

AUTHORIZED—Unlimited; outstanding, 1986 series, Dec. 31, 1981, $30,000,000.

DATED—Mar. 1, 1956.

MATURITY—Mar. 1, 1986.

INTEREST—M&S1 at office of trustee or Morgan Guaranty Trust Co., New York.

TRUSTEE—Texas Commerce Bank N.A., Houston.

DENOMINATION—Coupon, $1,000; registerable as to principal; fully registered, $1,[illegible] and authorized multiples thereof.

CALLABLE—As a whole or in part on [illegible] days' notice at any time to the last day of each Feb., incl., as follows:

1981 .....100.72 1982 .....100.58 1983 .....[illegible]
1984 .....100.29 1985 .....100.15 1986 .....[illegible]

Also callable on like notice as above for sinking or improvement fund (which see), or replacement fund, or with certain deposited cash, at special prices to the last day of each Feb., incl., as follows:

1981 .....100.33 1982 .....100.28 1983 .....[illegible]
1984 .....100.18 1985 .....100.12 1986 .....[illegible]

SINKING OR IMPROVEMENT FUND—Annually, beginning 1959, in cash or 1986 series bonds, or with property additions at 60%, equal to 1% of maximum 1986 series bonds at any one time outstanding, less certain bonds retired. Requirement may not be anticipated.

REPLACEMENT FUND—Same as for first 3s, due 1989.

SECURITY, OTHER PROVISIONS—Same as for first 3s due 1989.

PURPOSE—Proceeds used to repay bank loans; for construction and other corporate purposes.

OFFERED—($30,000,000) at 101.153 (proceeds to company 100.604) on Mar. 8, 1956, by Halsey, Stuart & Co., Inc., Chicago and associates.

4. Houston Lighting & Power Co. first 4¾s, due 1987:

Rating—A 1

AUTHORIZED—Unlimited; outstanding, 1987 series, Dec. 31, 1981, $40,000,000.

DATED—Nov. 1, 1957.

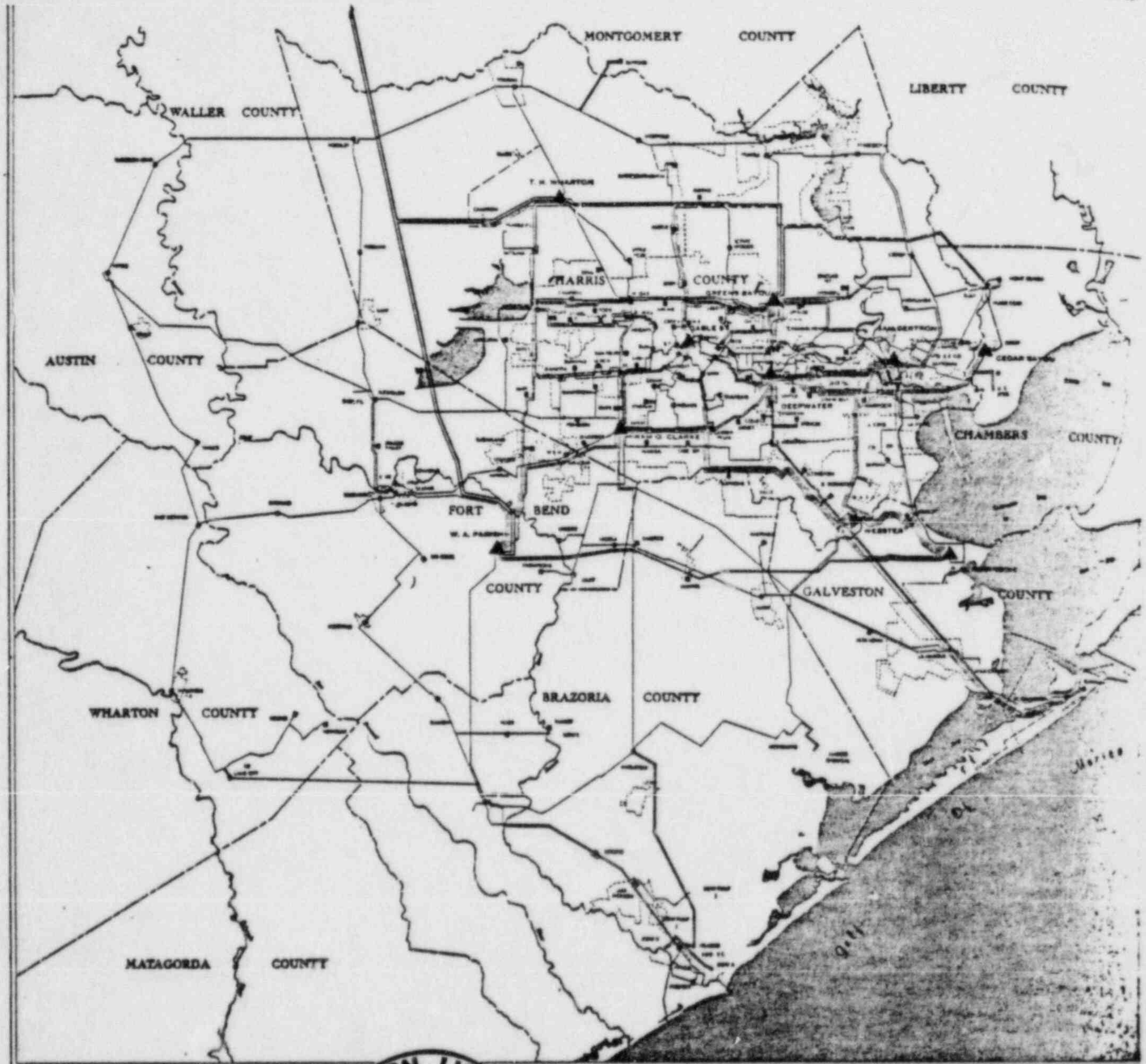
MATURITY—Nov. 1, 1987.

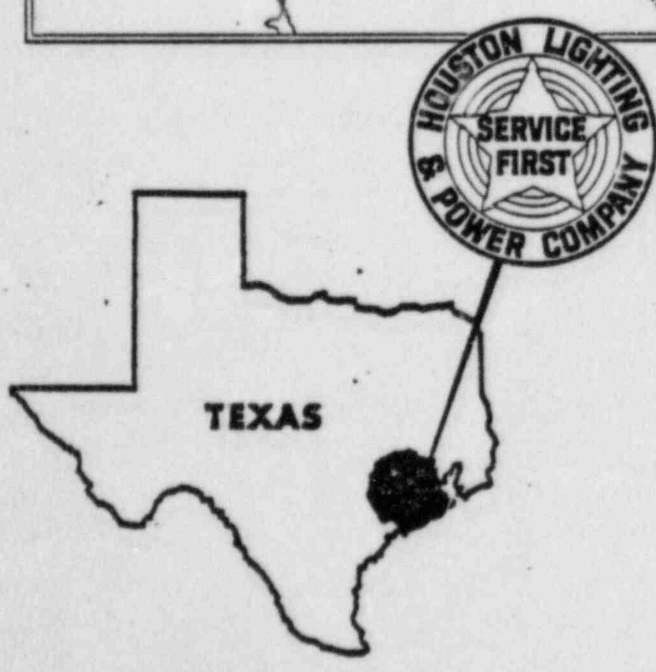
INTEREST—M&N 1 at office of trustee or Morgan Guaranty Trust Co., New York or Halsey Stuart & Co., Inc., Chicago.

TRUSTEE—Texas Commerce Bank N.A., Houston.

DENOMINATION—Coupon, $1,000; registerable as to principal; fully registered, $1,[illegible] $10,000 and authorized multiples of $1,[illegible] C&R interchangeable.

CALLABLE—As a whole or in part, on [illegible] days' notice at any time to Oct. 31 incl., as follows:





SYSTEM MAP
HOUSTON LIGHTING
& POWER COMPANY

345 kv lines
138 kv lines
69 kv lines
☐ Switch Racks
▲ Generating Plants
■ Substations

ATTACHMENT

I. Project Management Overview

Houston Lighting & Power Company (HL&P), acting as PROJECT MANAGER for itself and the other owners, City Public Service Board of San Antonio, City of Austin, and Central Power and Light Company, has responsibility for design, engineering, procurement, fabrication, quality assurance, construction and operation of the South Texas Project. HL&P has contracted with Westinghouse Electric Corporation (Westinghouse) for the design, fabrication and quality assurance (QA) services for the nuclear steam supply system, and with Bechtel Power Corporation (Bechtel) for plant design, procurement, engineering, construction management, QA and other related services including QA services for Westinghouse items upon receipt at the Project site. HL&P has contracted with Ebasco Services Incorporated (Ebasco) for construction services including QA and quality control (QC) for its scope of work.

Figure 1 shows the organizational structure and functional relationship among HL&P, Bechtel and Ebasco for the four major functional areas: QA, Engineering, Construction, and Controls. Project direction is provided from the HL&P Manager, South Texas Project, to the Project Manager of Bechtel. The HL&P Project organizations provide a performance overview of the respective Bechtel Project organizations. Bechtel, as Construction Manager, directs the activities of Ebasco and performs a QA overview of Ebasco activities. Bechtel is responsible to assure that all Balance of Plant systems meet the NSSS interface requirements. Bechtel is also responsible for any necessary technical review of the NSSS equipment and associated support services. HL&P project management provides programatic overview and direction relative to the Bechtel-Westinghouse interface.

The current internal organizational structures of HL&P, Bechtel and Ebasco for the South Texas Project are shown in Figures 2, 3 and 4, respectively.

Although there may be modifications to these internal structures, the functional relationships between the respective organizations will remain as indicated by Figure 1.

II. Quality Assurance

The QA Program for STP is described in the Quality Assurance Program Description, Revision 3 (QAPD), which was submitted to NRC by letter dated March 9, 1982. Figure 5 shows key aspects of the relationships and responsibility of the respective QA organizations. The STP QA organizations coordinate with project management for day-to-day project direction, but report independent of project management for quality-related functions. The HL&P Project QA Manager reports to HL&P's Executive Vice President, Nuclear Group; the Bechtel Project QA Manager reports to the Bechtel Los Angeles Power Division QA Manager for Domestic Projects; and the Ebasco Quality Program Site Manager reports to the Ebasco Chief Quality Engineer.

HL&P has QA responsibility for design, engineering, procurement, fabrication, construction and operation of STP. As described in the QAPD, there is an HL&P performance overview of the QA activities of Bechtel and Ebasco, and a Bechtel performance overview of the Ebasco QA activities.

III. Design Review and Design Verification

HL&P, as Applicant, has the responsibility for the design of STP. HL&P has contracted with Westinghouse for the Nuclear Steam Supply System which includes the appropriate design review and design verification as related to the W scope of supply. HL&P has contracted with Bechtel to perform the design for the balance of plant systems and all structures. The requirements of 10CFR50, Appendix B Criterion III, Regulatory Guide 1.64 (Rev. 2) and ANSI N45.2.11-74 have been adopted for project design activities and are applied to Bechtel Engineering work in accordance with Bechtel's Quality Assurance Program documented in BQ-TOP-1, Rev. 3A (approved by the NRC) and the STP Quality Assurance Program Description, Rev. 3. Bechtel will perform and document design reviews and design verifications in accordance with its Engineering Department Procedures as implemented for the South Texas Project.

HL&P Engineering performs reviews of selected elements of the completed design, design documents and specifications to ensure that contractural requirements are met. Figure 6 shows the key aspects of the relationship and responsibilities of the Bechtel and HL&P Engineering teams. The interface between HL&P and Bechtel Engineering is through the HL&P Manager, Engineering and the Bechtel Project Engineering Manager. At other Engineering levels there is a regular and routine communication.

In addition to the HL&P Project Engineering performance overview of Bechtel separate reviews of certain elements of the plant design will be performed by the recently created Engineering Assurance Department (EAD). These reviews will provide further confidence in the technical adequacy of the engineering and design of the STP. The Engineering Assurance Department is a separate organization from the STP. Therefore, Figures 2 and 6 do not reflect this organization. The Manager of the Engineering Assurance Department reports directly to the Vice President, Nuclear Engineering and Construction.

Ebasco, as Constructor, will implement the design issued to it by Bechtel. The design documents will be forwarded to Ebasco through Bechtel Construction Management. As presently organized, all major design will be done by Bechtel. Any required site design activities will either be performed by Bechtel Engineering or will be performed under the design control of Bechtel Engineering.

SOUTH TEXAS PROJECT
MANAGEMENT ORGANIZATION

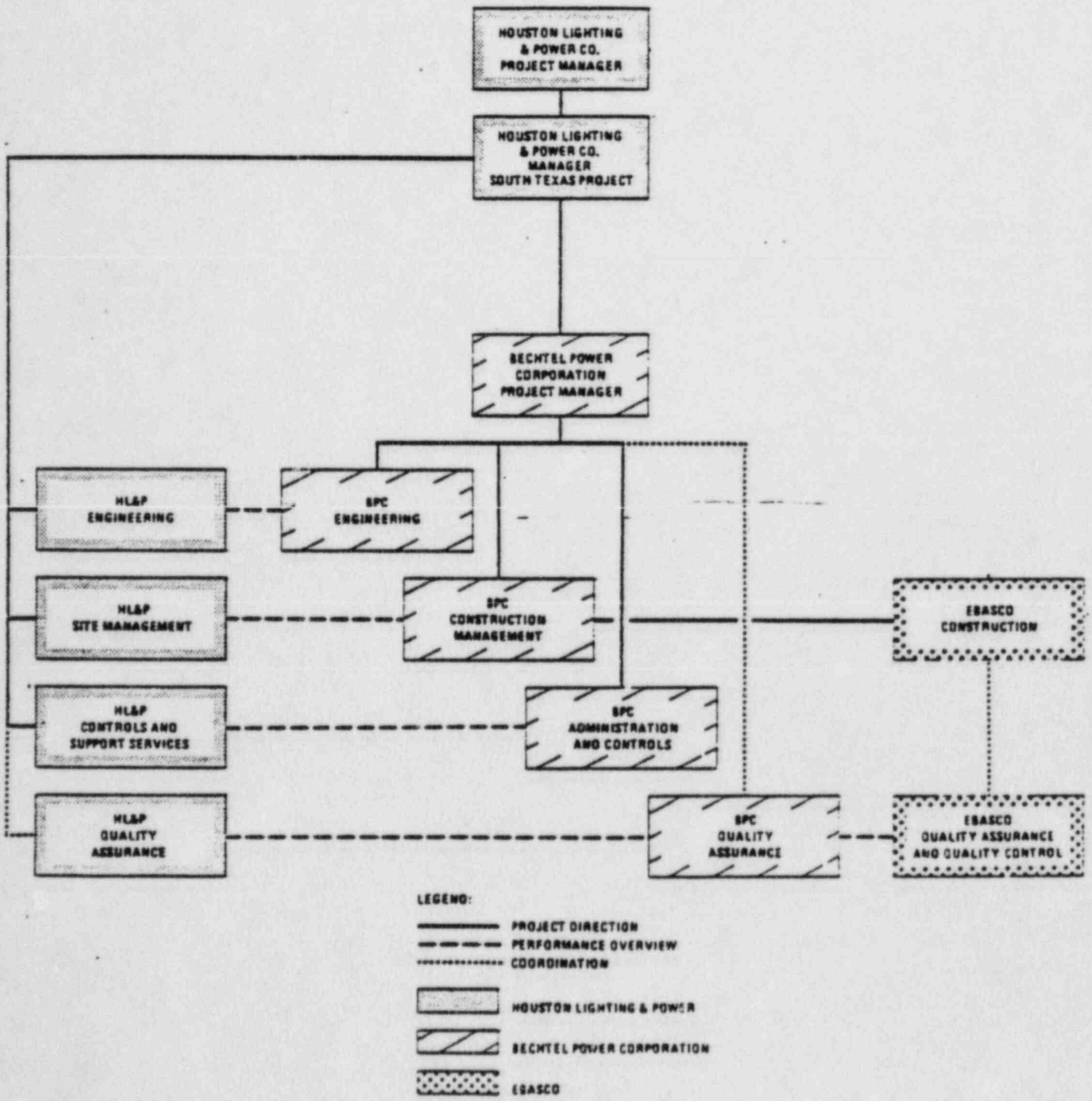


Fig. 1

HOUSTON LIGHTING & POWER C ANY
SOUTH TEXAS PROJECT
PROJECT MANAGEMENT
MARCH 17, 1982

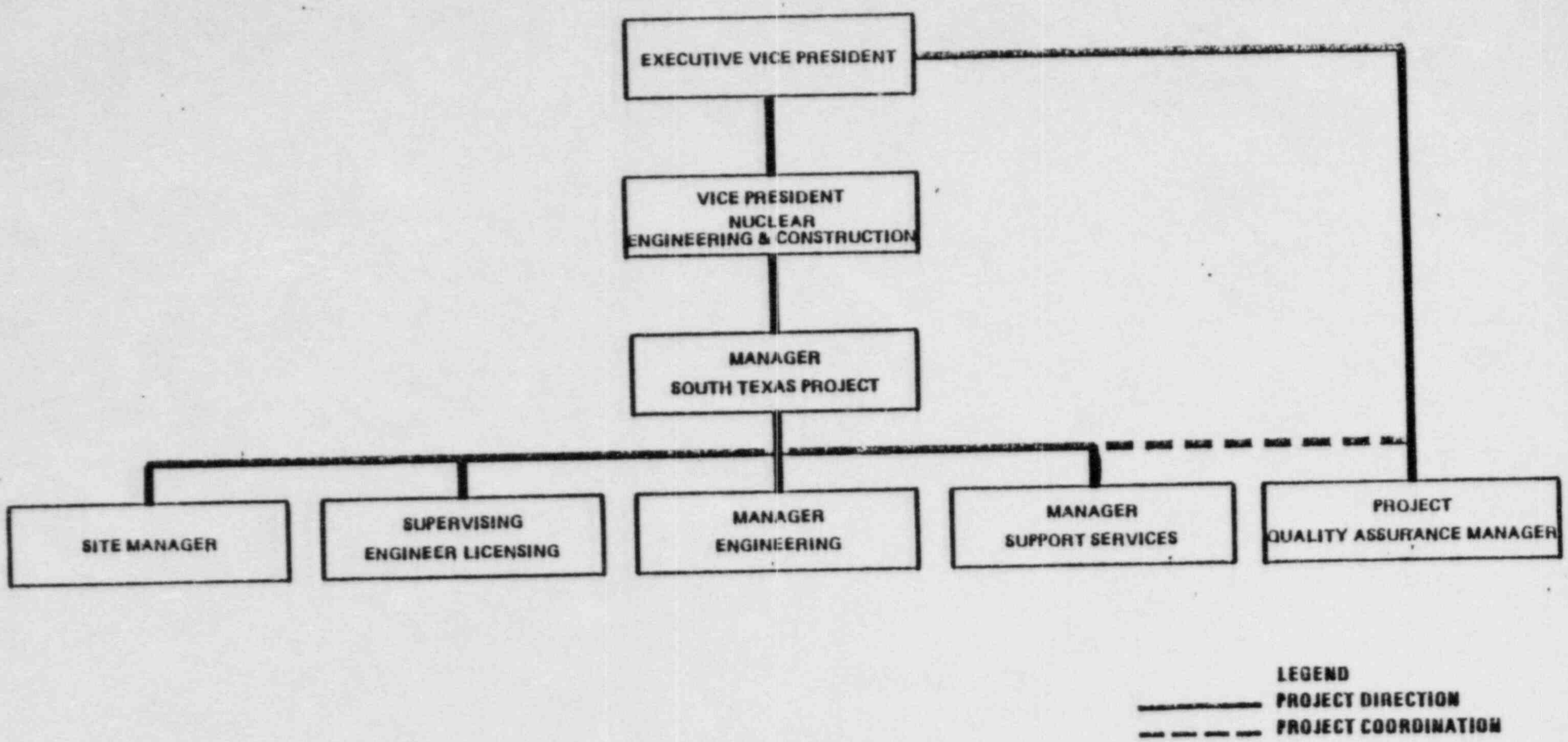


FIG 2

SOUTH TEXAS PROJECT
BECHTEL POWER CORPORATION
ORGANIZATION

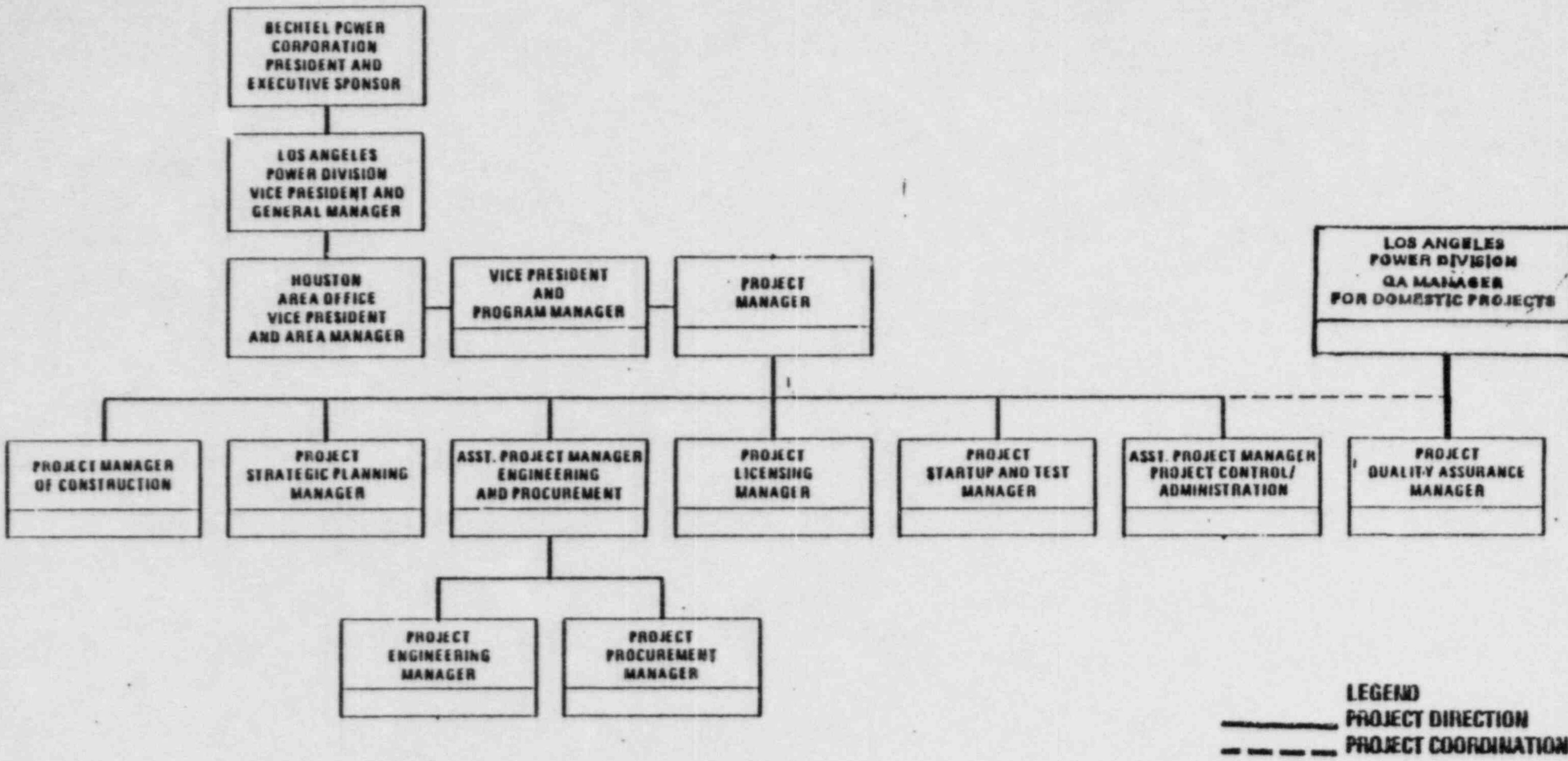


Fig. 3

SOUTH TEXAS PROJECT

EBASCO SERVICES, INC.

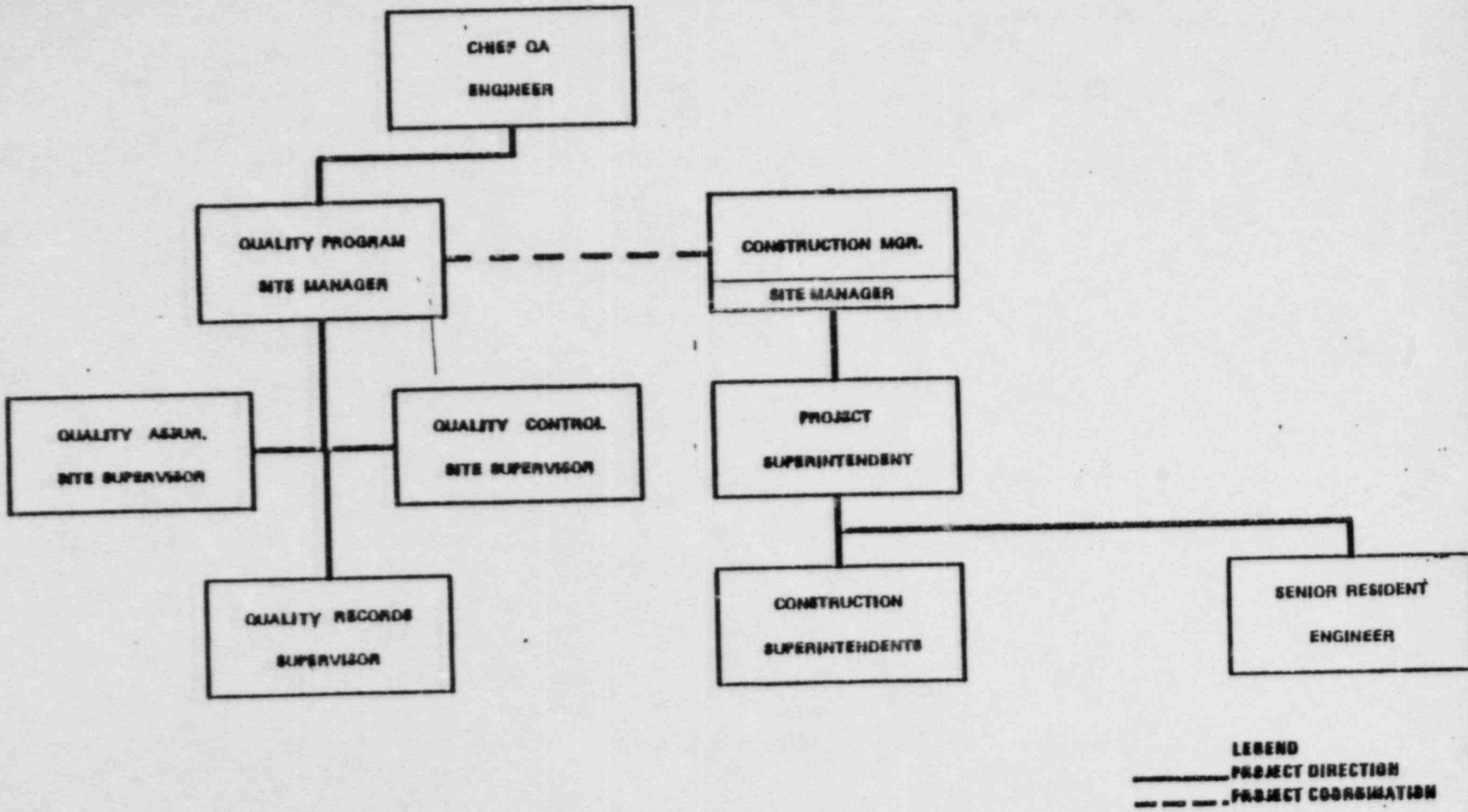


Fig. 4

SOUTH TEXAS PROJECT
ELECTRIC GENERATING STATION
QUALITY ASSURANCE ORGANIZATIONS

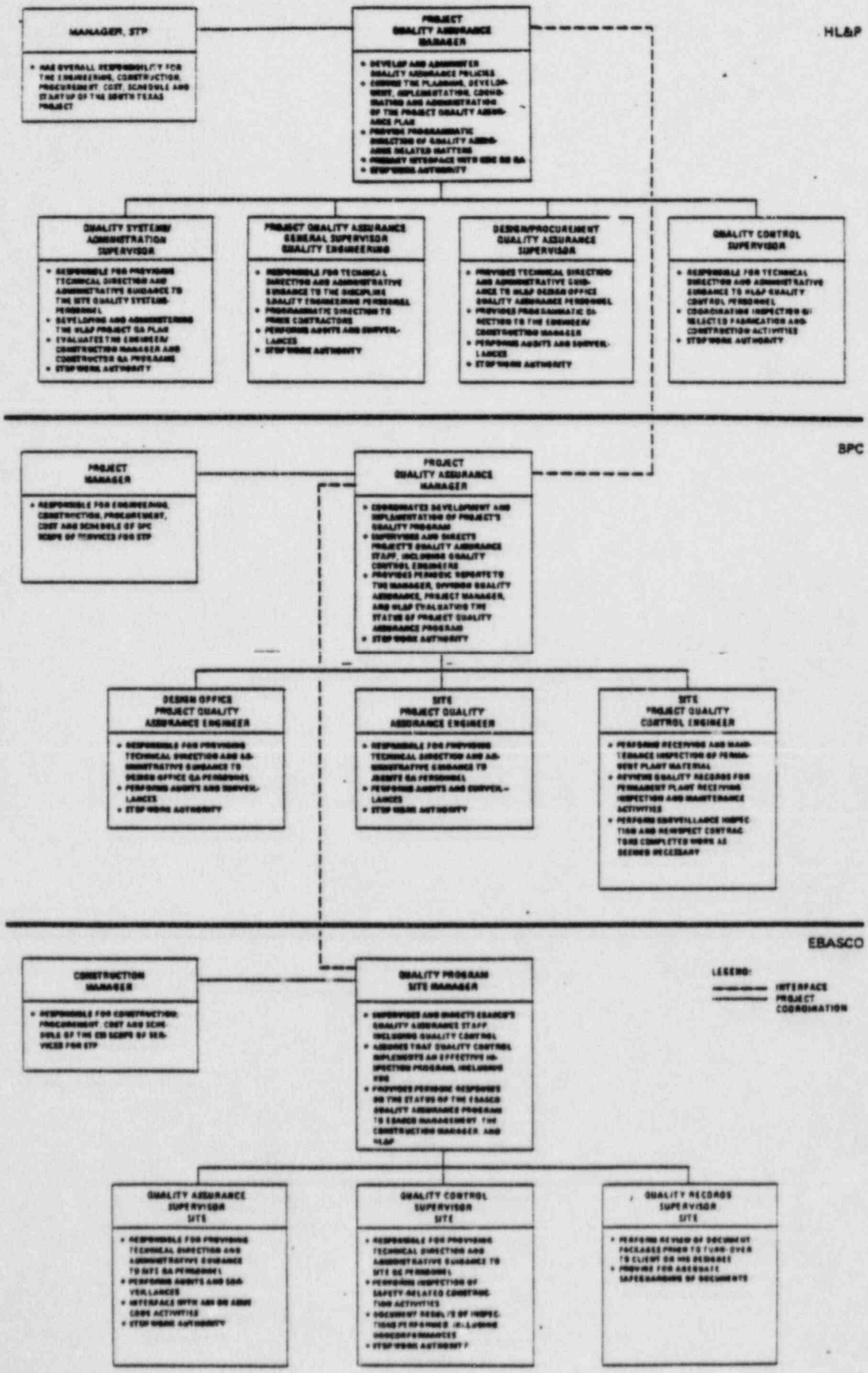
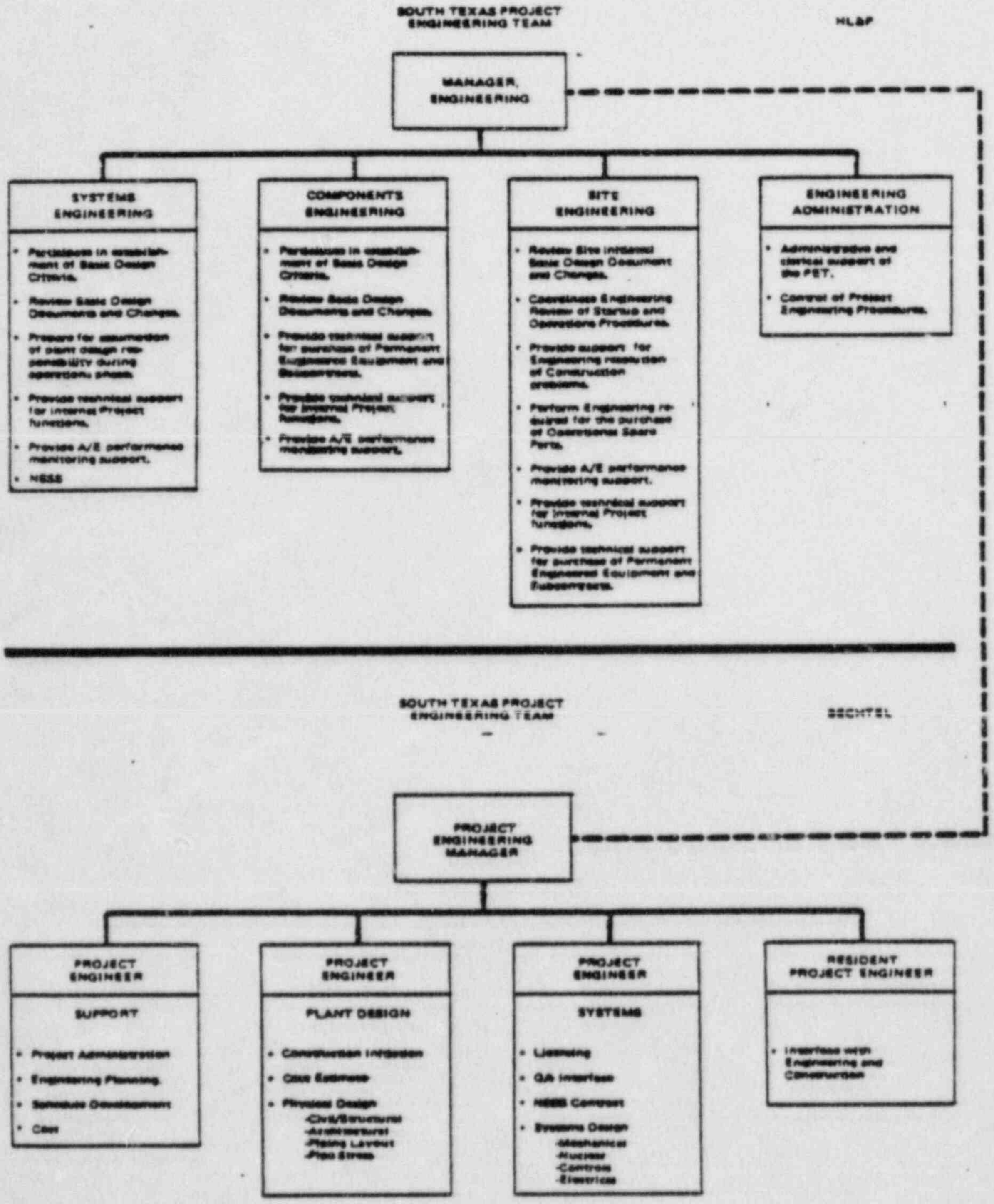


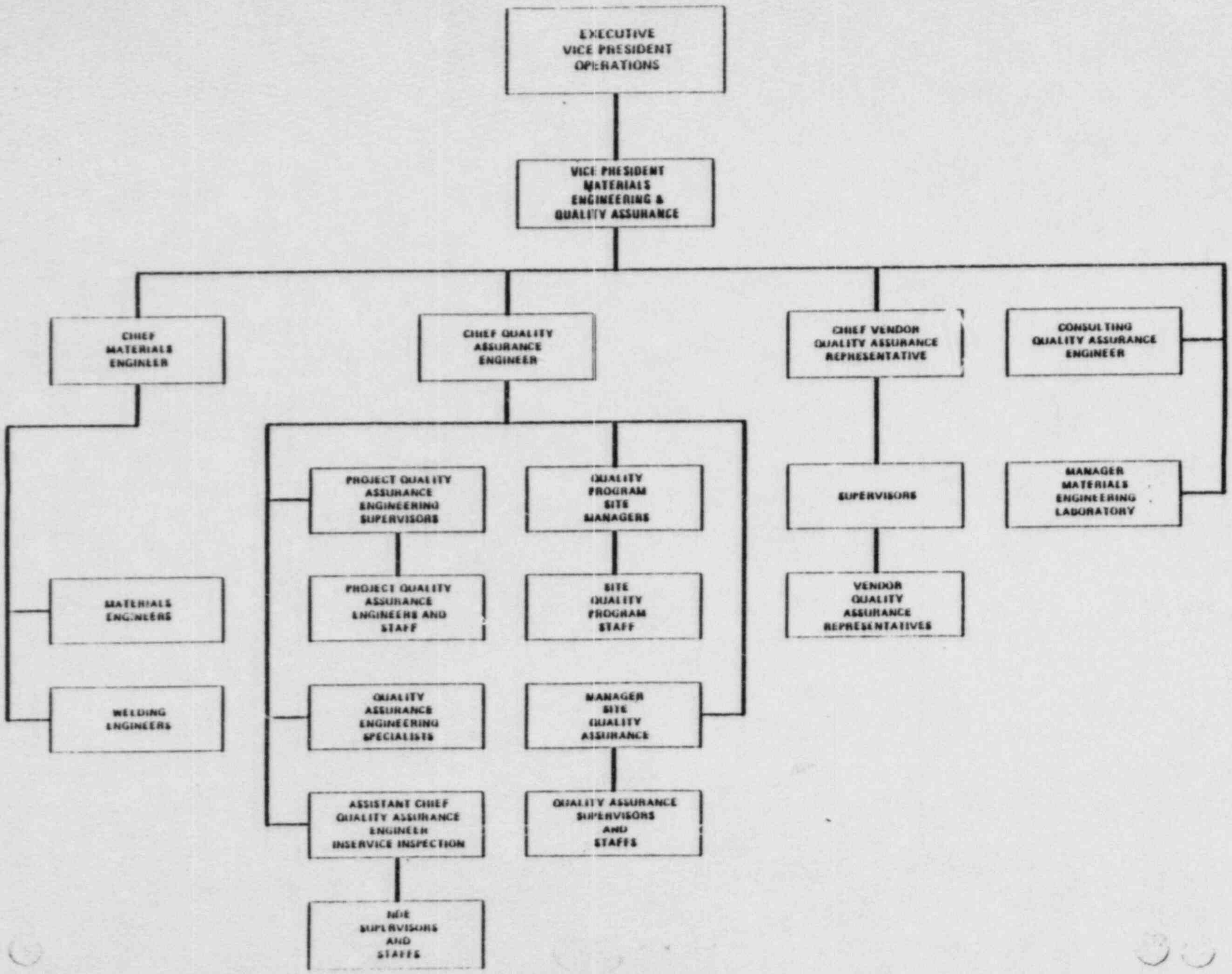
Fig. 5



PROJECT DIRECTION ——— INTERFACE - - - - - FIGURE 4

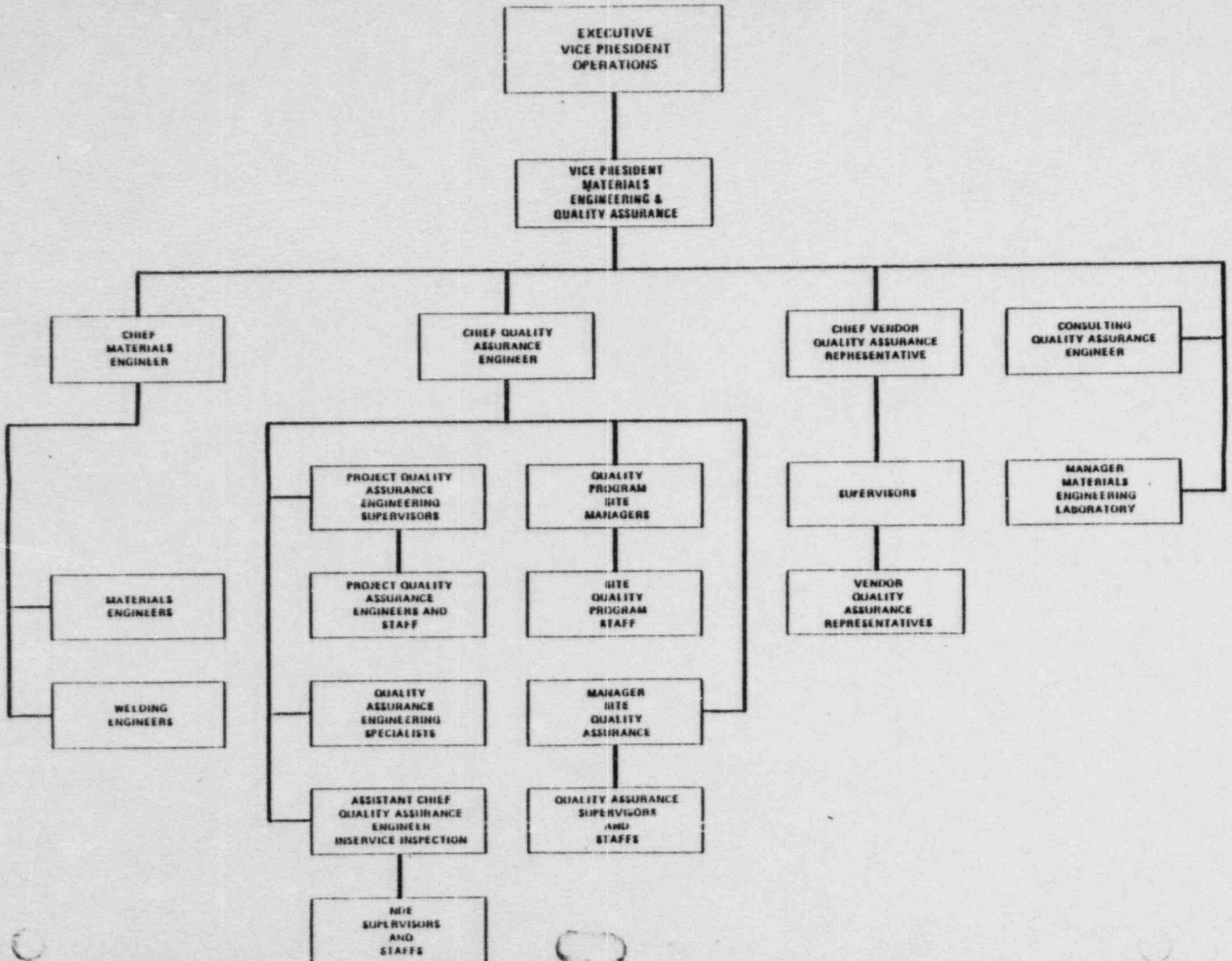
Ebasco Services Incorporated

MATERIALS ENGINEERING & QUALITY ASSURANCE ORGANIZATION



Ebasco Services Incorporated

MATERIALS ENGINEERING & QUALITY ASSURANCE ORGANIZATION



FIGU... 2.2
REV 4

The following is a modification to Appendix "A" of the topical which describes Bechtel's position on Regulatory Guide and ANSI standards:

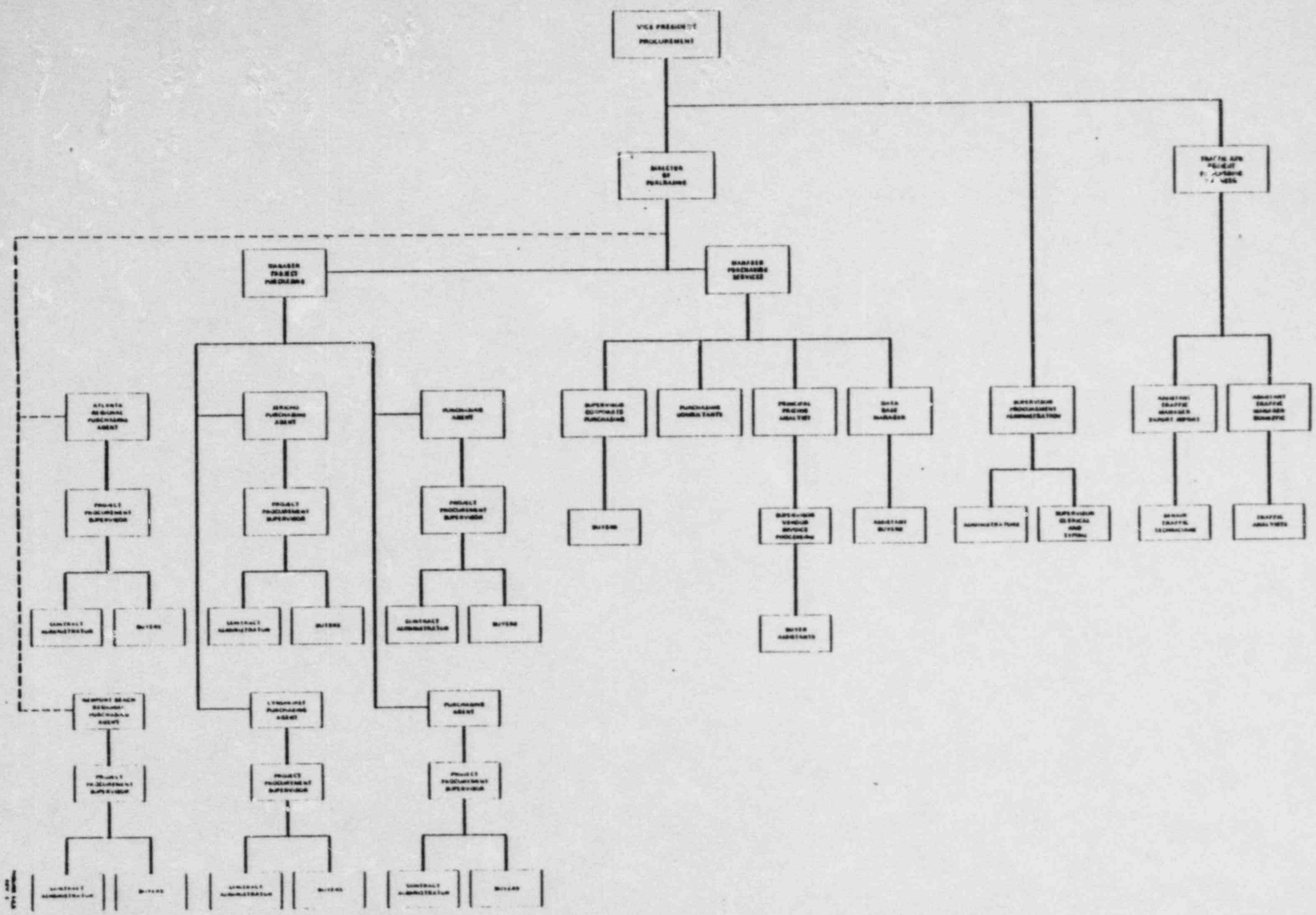
- Reg. Guide 1.58 Rev. 0, 8/73 Plus positions C.5, C.6, C.7, C.8
  ANSI N45.2.6, 1973 and C.10 of Rev. 1

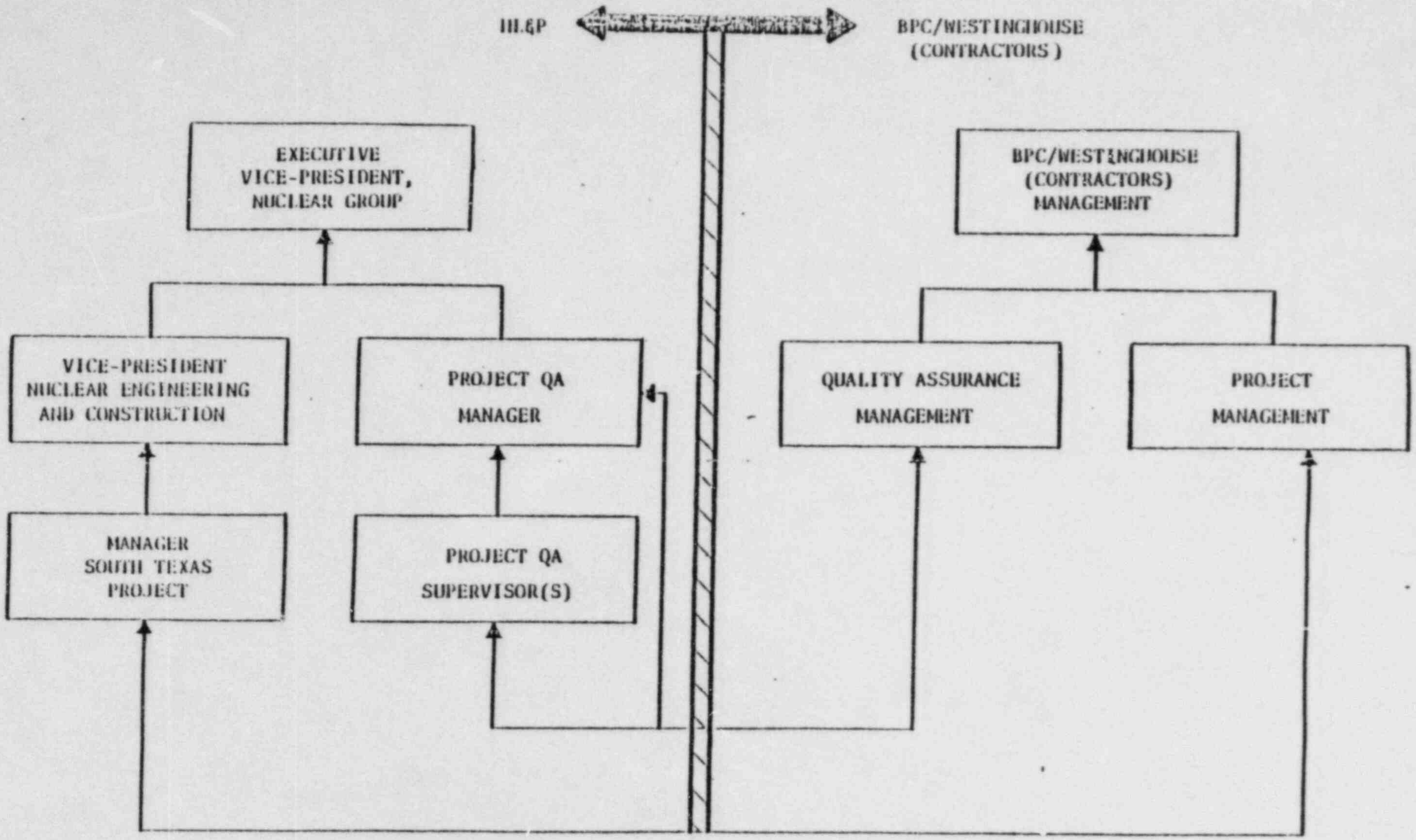
- Reg. Guide 1.144 Rev. 1, 9/80
  ANSI N45.2.12, 1977
  Full Compliance - No Exceptions

- Reg. Guide 1.146 Rev. 0, 8/80
  ANSI N45.2.23, 1978
  Full Compliance - No Exceptions

Ebasco Services Incorporated

PURCHASING & TRAFFIC DEPARTMENTS
ORGANIZATION CHART





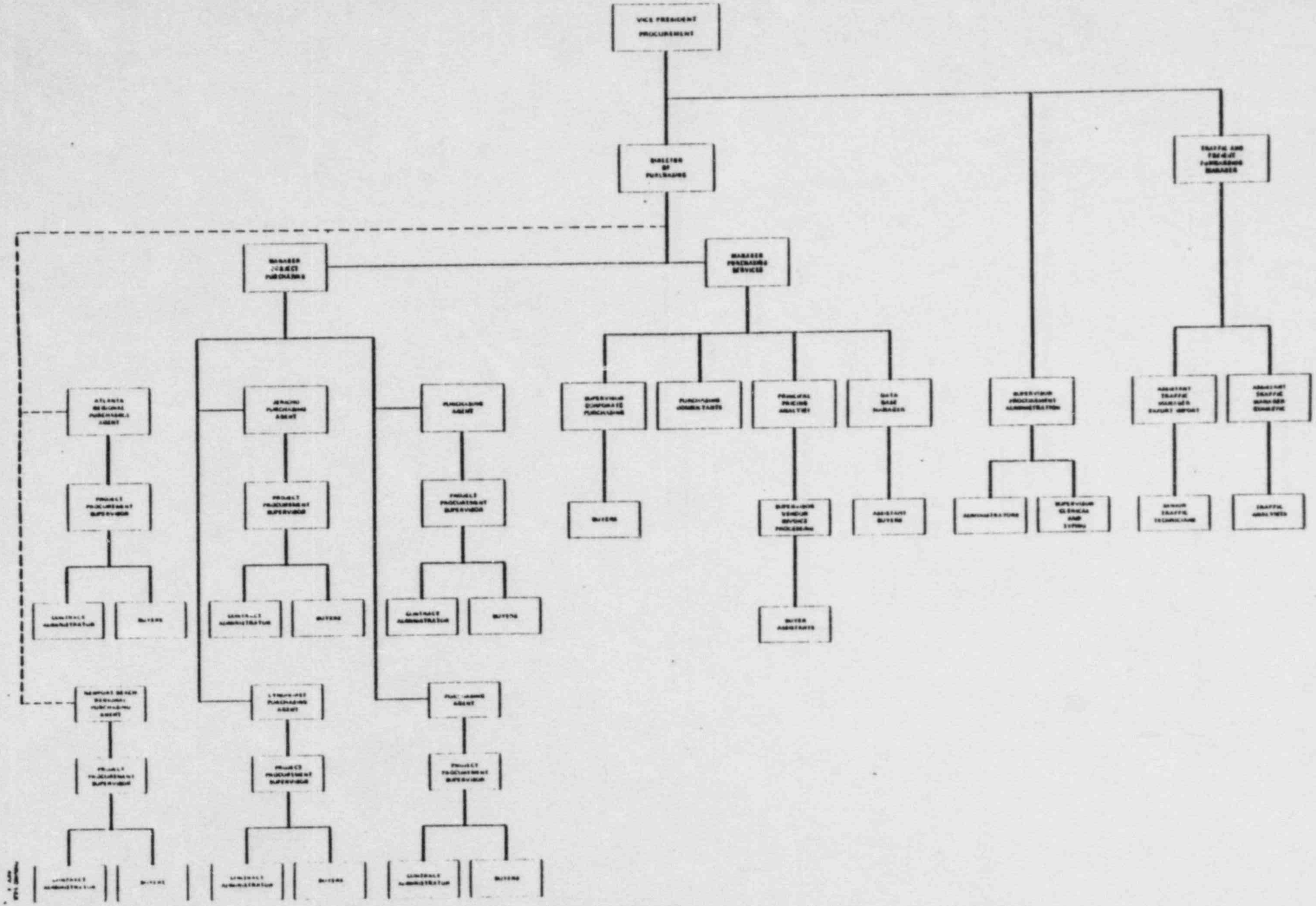
LINES OF COMMUNICATION
HL&P and BPC/WESTINGHOUSE (CONTRACTORS)

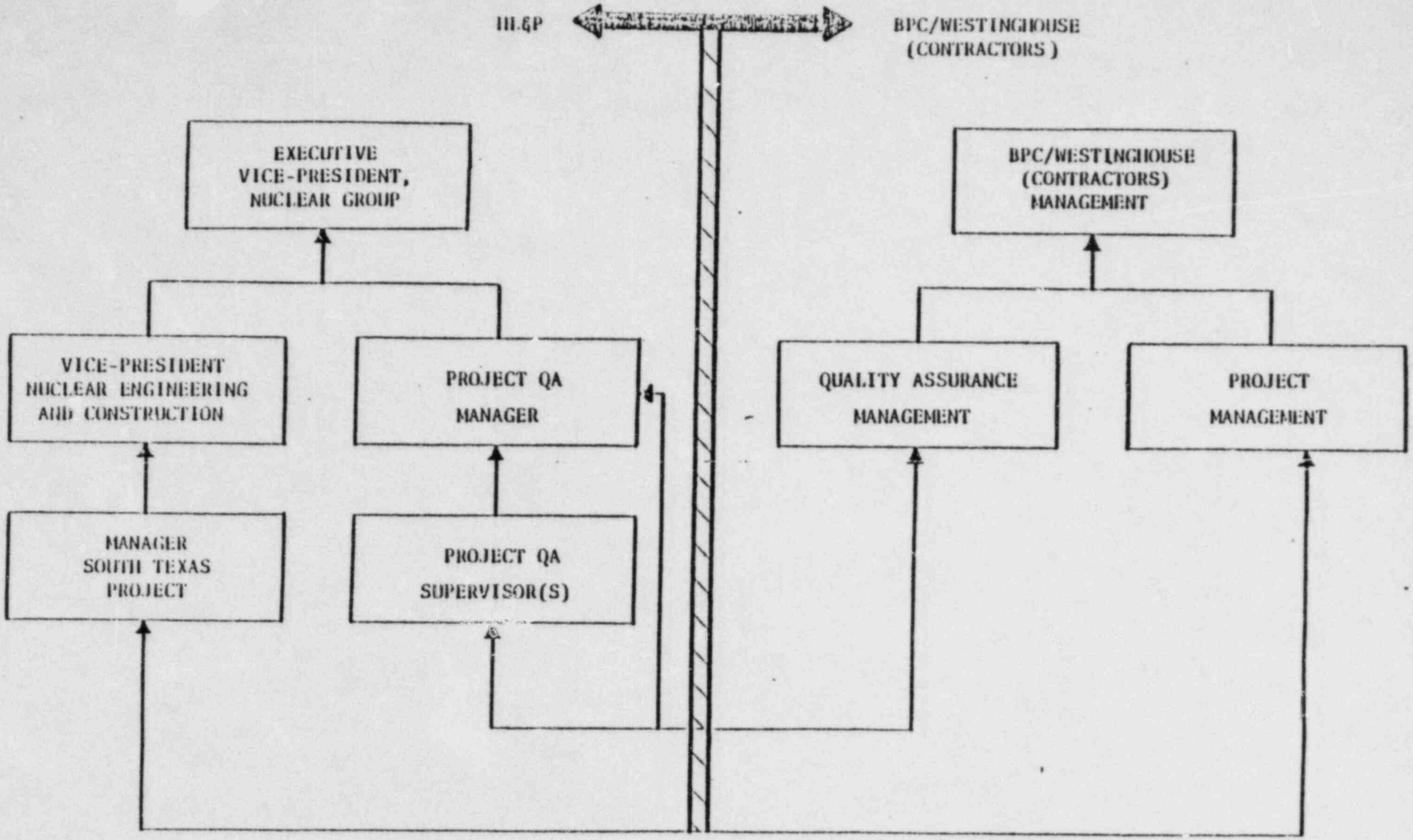
FIGURE 2

Ebasco Serv... Incorporated

PURCHASING & TRAFFIC DEPARTMENTS

ORGANIZATION CHART





LINES OF COMMUNICATION
HL&P and BPC/WESTINGHOUSE (CONTRACTORS)

FIGURE 2

The following is a modification to Appendix "A" of the topical which describes Bechtel's position on Regulatory Guide and ANSI standards:

- Reg. Guide 1.58 Rev. 0, 8/73 Plus positions C.5, C.6, C.7, C.8
  ANSI N45.2.6, 1973 and C.10 of Rev. 1

- Reg. Guide 1.144 Rev. 1, 9/80
  ANSI N45.2.12, 1977
  Full Compliance - No Exceptions

- Reg. Guide 1.146 Rev. 0, 8/80
  ANSI N45.2.23, 1978
  Full Compliance - No Exceptions

QUALITY ASSURANCE CASE STUDY WORKING PAPER

CASE D

Prepared for
Nuclear Regulatory Commission
Washington, DC 20555

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TABLE OF CONTENTS

QUALITY ASSURANCE CASE STUDY WORKING PAPER

CASE D

I. SUMMARY

A. Introduction

The Nuclear Regulatory Commission (NRC) has undertaken a study of selected nuclear reactor construction projects to determine the important factors, or root causes, that underlie effective and ineffective assurance of quality programs. Several nuclear projects that have experienced major quality-related problems and several that have not were selected for the study. Data and findings from these site-specific studies will be used by the NRC in formulating generic policies and programs related to the assurance of quality during design and construction of nuclear reactor projects and in responding to Section B of NRC's FY 1982-83 authorization bill (the Ford Amendment). This working paper summarizes the findings from the fourth case study (Case D). The Case D licensee was selected for the case studies because it had experienced problems in design activities and in quality of construction that resulted in the issuance of an NRC Show Cause Order.

The case study team was comprised of four subteams of two personnel each. One subteam concentrated on project engineering/design, one subteam concentrated on construction, one subteam concentrated on quality assurance/quality control, and one subteam concentrated on project management. Prior to visiting the Case D licensee, the case study team members reviewed NRC inspection reports, investigation results, hearing transcripts and other documentation pertaining to the project. The NRC project team leader and one team member visited the licensee's corporate offices for two days the week before the Case D site visit to interview top level corporate personnel responsible for nuclear projects. This advance team also visited the NRC regional office for two days the week before the Case D site visit to interview cognizant regional personnel and to review pertinent NRC records.

The case study team spent five days conducting interviews at the licensee's corporate and engineering offices and at the plant site. About 60 individuals involved in the project were interviewed, including personnel of the licensee, the architect engineer/ construction manager (AE/CM), the constructor (C), and cognizant NRC regional personnel. Licensee personnel interviewed ranged from the President and Chief Executive Officer to site QC inspectors and included each level in between. Cognizant NRC regional personnel participated in some subteam interviews and in the exit conference. The licensee changed AE/CM and C organizations during the project. Interviews during the case study were with the current AE/CM and C personnel. No interviews with the former AE/CM and C personnel were held.

In addition to conducting interviews, the case study team spent one-half day touring the construction site. The case study culminated in a briefing for licensee management and project staff members, in which the preliminary results of the case study were presented and the licensee was given an opportunity to respond to the team's preliminary results. The case study team did not evaluate the adequacy of design or quality of construction.

B. Background

Early in the 1970s, the Case D licensee decided to construct nuclear generating plants. A possible natural gas shortage, the favorable economics of nuclear power, and public acceptance of nuclear power were reasons the nuclear option was deemed by the licensee to be a logical choice. Two projects were initiated, one in which the licensee would be sole owner (and which was later canceled) and the other a joint partnership with the licensee as project manager for all aspects of engineering design, construction, and operation. This latter project comprised two large (greater than 1000 MWe) units. The first-unit operation was projected for the 1981-1982 timeframe, with second-unit operation to follow about two years later. Both units have been delayed.

The licensee had no prior nuclear experience, but this was not seen as an insurmountable obstacle. Many other utilities were (or had been) in the same position, and the leaders in the industry were viewed as not having that much more experience.

In selecting an architect-engineer/construction manager/constructor (AE/CM/C), the licensee had compiled a candidate list that included the firm selected. Because many nuclear plants had been on order in the late 1960s and early 1970s, most AE firms were committed and the licensee realized there would not be an opportunity to select from a large number of firms. It selected a large engineering and construction firm that had a national and international reputation of doing things within time and cost, had been a successful contractor in chemical plants and oil field and pipe line construction and had committed itself to growth in the nuclear industry and to getting top people by hiring personnel from other architect engineer organizations having nuclear experience. Its primary forte up to the early 1970s, however, had been in other than nuclear work. It did not have as extensive nuclear experience as many other AE or constructor firms. Although it had previous experience as constructor at two nuclear plants, this would be its first major nuclear engineering and design project and the first nuclear project for which it was construction manager.

When the licensee applied for a construction permit in the mid-1970s, it was received about 6-8 months earlier than either the licensee or its AE/CM/C expected. This may have been the result of a national emphasis to streamline the licensing process (a few years previously, the oil embargo had taken place and there was national concern over energy independence). The licensee maintained (during the site visit) that rapid licensing resulted in construction being started before an adequate amount of design and engineering (estimated by the licensee at less than 25%) had been completed.

The licensee recognized that managing a nuclear plant construction project would require a greater involvement than that required for a fossil plant. Early in the project, the licensee used a matrix-type organization to manage the project. The approach was recognized to be embryonic, but thought capable of doing the job. Project management rested on an organization that had responsibility for both nuclear and fossil projects. When starting the project, the licensee moved personnel from fossil into nuclear and hired several personnel with prior nuclear design and construction experience. The licensee assigned personnel to its nuclear projects based upon the needs of each project.

In 1977, the licensee became concerned about meeting schedules and about disparities, such as the amount of concrete poured and the amount scheduled, and hired an independent organization to evaluate project management. The independent organization reported the project was not within schedule and cost and was not as complete as reported by the AE/CM/C.

In the mid-to-late 1970s, quality-related problems resulted in the licensee suspending concrete and welding activities. Allegations were made of harassment and intimidation of QC inspectors and inadequate support of inspection by supervision. The cognizant NRC regional office discussed low morale of quality assurance/quality control (QA/QC) personnel, QA/QC staffing below licensee specified levels, concrete placement problems, and weaknesses in QA/QC program implementation with licensee management.

In late-1978, the licensee initiated a study of whether the AE/CM/C should be replaced. Consultations with other AEs and constructors led the licensee to conclude that it would do best to support and improve the AE/CM/C organization and to become more involved in the design and construction activities. Thus, during the course of the project and up into the early 1980s, the licensee increased its involvement in the AE/CM/C activities. In 1978, following a consultant report that there was a high likelihood of both cost and schedule overruns, the licensee acted to strengthen its project management. It made the power plant engineering and construction manager the nuclear project manager and created a project management team reporting directly to him. About 30 experienced personnel were added from a consultant organization until the licensee could replace them with comparable personnel.

In 1979, following an independent management audit, the licensee expressed written concern about the AE/CM/C's performance and directed it to take several actions in the areas of construction supervision, planning, scheduling, control of construction work, labor productivity, and site housekeeping. The AE/CM/C agreed in large measure with the licensee's assessment and already had begun corrective measures to improve its performance. While some concerns were promptly resolved, others continued to require the attention of the licensee.

The NRC performed an acclerated mid-term inspection (middle of construction) that identified five noncompliances related to the QA program. As a result of the licensee being considered ineffective in correcting poor construction practices and continual allegations of harassment and intimidation of QA/QC personnel, the NRC performed a comprehensive team inspection/investigation, which resulted in a NRC Show Cause Order in early 1980. That order required the licensee to show cause why the construction permit should not be revoked or construction should not be suspended. The Show Cause Order indicated that procedural and programmatic inadequacies in the licensee and AE/CM/C organizations resulted in a failure to systematically identify quality problems and to routinely correct and prevent recurrence of identified problems; that procedural, organizational, and personnel inadequacies resulted in a lack of adequate control of safety-related construction activities; and that lack of detailed knowledge and involvement hindered the licensee's ability to maintain adequate control over the AE/CM/C.

Corrective action was started in each area of the Show Cause Order immediately after notification and before actual receipt of the Show Cause Order. The licensee reorganized the project, hired experienced personnel from other nuclear construction projects, added its own QC inspection presence at the site, required the AE/CM/C to change its QA/QC program and assisted the AE/CM/C in hiring and relocating personnel with nuclear design and construction experience.

In the early 1980s, the licensee hired an independent organization to review the design work for the project. The independent organization reported that design work was not sufficiently completed to support construction. Subsequently, the licensee terminated the AE and CM parts of the AE/CM/C's contract and later the AE/CM/C terminated the construction part of the contract. The licensee replaced the AE/CM/C with two separate organizations having extensive nuclear construction experience. One has contractural responsibility for all design as the AE and functions as the construction manager and the other is the constructor. The licensee maintains overview responsibility of the daily activities of both organizations. Safety-related work resumed in the fall of 1982.

The licensee has matured in managing and overseeing the project by:

- hiring personnel with nuclear experience for key positions
- approving key AE/CM and C management personnel
- increasing training
- reviewing AE/CM and C quality assurance programs, training procedures and personnel qualification records
- establishing formal interface agreements, a joint records management system with the AE/CM, a stronger quality engineering function and an engineering assurance group to perform independent design verification.

The licensee has become less directly involved in the daily activities of the AE/CM and C and has concentrated on its overview role. The licensee attends weekly meetings with AE/CM personnel and monitors planning, scheduling and cost. Licensee site personnel monitor schedules, analyze monthly output records and review manpower loading. The licensee also holds monthly project review meetings.

Constructor QC personnel have first line QC inspection responsibility. AE/CM QC personnel reinspect selected work that the constructor QC has inspected. As an overcheck, licensee QC personnel reinspect selected work that the AE/CM QC has inspected and selected work that the constructor QC has inspected.

The licensee has over 500 personnel assigned to the project and consulting personnel hired earlier have been replaced. The licensee is developing its engineering capability for future work on the project by having 13 engineers work for the AE/CM.

In mid-1983, there were about 1,500 manual personnel at the construction site. This number was expected to increase to about 3,000 by the end of 1983.

C. Summary of Root Causes

The case study team believes the root causes that underlie ineffective assurance of quality prior to the NRC Show Cause Order are:

1) Inexperience of the Project Team

While the licensee had extensive experience in constructing and operating fossil plants, it had not been involved with constructing a nuclear plant. It apparently failed to totally appreciate the difference in scope and complexity between the two, as reflected in the controls applied to the project. The licensee was organized by technical discipline into a matrixed fossil-nuclear organization. Personnel were shuffled from fossil to nuclear and vice-versa as the need for a particular discipline arose. As a consequence, a requisite core of full-time professionals was slow in developing. The licensee did hire some staff with nuclear experience; however, they were not sufficient to provide the necessary core of competence.

The licensee's lack of nuclear experience was further aggravated by the lack of experience of key individuals involved with the construction project. This project was the first nuclear project for the licensee's project manager, project engineering manager, and the quality assurance manager.

Licensee inexperience resulted in four management levels between the site quality assurance organization and the executive vice-president responsible for the project. The delay and filtration of information caused by this managerial superstructure contributed to incomplete understanding at the executive level of the problems that were developing.

Historically, the licensee had depended upon its contractors to do the bulk of the planning and execution of fossil plant construction jobs. The licensee assumed that this same approach would be appropriate for the nuclear project and, consequently, placed too much reliance on the prime contractor.

While not adequately involved at higher levels of management, in some respects the licensee became too involved at lower levels. Licensee personnel found themselves directly in the approval chain for AE/CM/C design approvals and other documents. This had the effect of unduly restricting work flow. Everyone in the chain had veto authority, and everyone had to agree. Toward the end of the AE/CM/C's tenure, the licensee assumed much of the contractor's responsibility in an intensive but vain effort to help the contractor's effectiveness. In effect, the engineering work that was performed was the product of the AE/CM/C and the licensee instead of the product of the AE/CM/C with licensee overview.

The licensee failed to recognize and understand that the problems encountered were symptoms of larger problems in the licensee's control of the project.

Although the licensee was involved in providing direction from the beginning, their experience level restricted the direction and resulted in insufficient and unclear management direction and involvement and the diffusion of responsibility to inappropriate levels of authority.

The AE/CM/C, like the licensee, had inadequate nuclear experience. As a consequence, according to the licensee, the AE/CM/C did not understand the complexity of nuclear plant design and construction and did not bring to bear the necessary technical and management skills. These problems were aggravated by the earlier-than-expected approval of the construction permit and, therefore, the AE/CM/C did not have the planned time to come up to speed on design and personnel competence. The AE/CM/C's lack of nuclear experience was also further aggravated by the lack of experience of key individuals involved with the construction project. According to licensee personnel, AE/CM/C first level management on the project had no nuclear experience nor did the principal AE staff.

The AE/CM/C inexperience resulted in construction being started before an adequate amount of design and engineering had been completed (estimated at less than 25% by the licensee), which resulted in an excessive amount of design evolution and rate of design change. Design work proceeded slowly and specifications and procedures were inadequate and formatted in complex ways. There appears to have been insufficient engineering support for design and construction. The capabilities that the AE/CM/C did have were channeled into those areas in which it had experience, to the neglect of other equally important areas, according to the licensee. Engineering efforts were scheduled based upon dictates from construction. This led to unrealistic demands on the engineering groups.

Licensee personnel stated that quality assurance and quality control were also dominated by construction. There were many conflicts between QA/QC and construction in which construction generally prevailed.

Licensee personnel also indicated that inexperience of the AE/CM/C resulted in insufficient and unclear management direction and involvement. According to licensee personnel, project management did not have an adequate understanding of the interfaces and responsibilities for such functions as QA/QC, engineering, design, and construction. As a result, the constructor did not react in a timely, effective way to problems and did not employ proper management systems to reveal the causes of problems and to prevent them from recurring.

2) <u>Inadequate Management Support for Quality</u>

Neither the licensee nor the AE/CM/C appeared to have had a full understanding of quality and quality assurance concepts as they applied to nuclear plant construction. Although both made commitments to quality, these were not actualized in the construction process. The licensee was not appropriately involved in monitoring the total scope and details of activities and did not know how to take effective corrective action to prevent recurrence of problems. The AE/CM/C did not sufficiently insulate QA/QC from cost and schedule demands, nor shield them from intimidation or harassment. Consequently, construction supervisors dominated the QA/QC functions, both in the field and in the form of published policy, which emphasized minimizing cost and maintaining schedule. The long chain of command filtered information and introduced inefficiencies into the decision making and implementing processes. To further compound these problems, the licensee had none of its own QA inspectors at the site until 1980. This gave low visibility to management support of quality, which may have been interpreted as a lack of backing from top management for quality.

3) Shortcomings in NRC's Licensing and Inspection Practices

A recurrent theme was that the NRC licensing process did not adequately address the ability and experience of the project management, nor was there adequate evaluation of whether the nuclear industry had over-extended itself at the time this plant was contracted. The inspection process also tended to ignore management issues. The irregular presence of NRC inspectors at the site early in the project was cited by the licensee as a contributing factor. The process used by NRC in identifying and dealing with problems was cumbersome and required excessive amounts of time. In effect, the NRC approach was one of allowing troublesome situations to progress to the point that a case could be built for taking the drastic action represented by a Show Cause Order. Some of the problems involving the NRC required up to two years to resolve.

4) Inability of Project Team to Adjust to Changing Nuclear Power Environment

The rapid proliferation of regulations during the mid-1970s was cited by the licensee as particularly troublesome, especially since the design of this particular plant was probably only about 25% complete when construction began in 1975 and proceeded more slowly than it should have in relation to construction activities. Regulatory changes from the TMI and Brown's Ferry incidents were also a severe blow to the project, according to the licensee.

Declining energy projections and increasing interest rates made funding plant construction more difficult. Incidents within the industry, such as TMI and Brown's Ferry, reflected into changed design requirements. All of these changes coming in rapid succession further complicated the task for the relatively inexperienced nuclear staff of the licensee and its AE/CM/C.

II. ROOT CAUSES OF THE PROJECT'S PROBLEMS WITH QUALITY IN CONSTRUCTION

Based upon review of NRC inspection reports, investigations, hearing transcripts and other documentation and interviews with current licensee, AE/CM, constructor and cognizant NRC regional personnel, the case study team believes that the following root causes were significant in contributing to the major quality and quality assurance problems experienced by this project before the NRC Show Cause Order.

A. Inexperience of the Project Team (Licensee and AE/CM/C) in Nuclear Plant Design and Construction.

1) Inexperience of the Licensee

This was the first nuclear plant project for the licensee. The licensee had successfully constructed fossil plants but did not change its approach adequately to adjust to the difference in complexity between fossil and nuclear plants. In retrospect; the licensee exhibited inadequate understanding of what was involved in constructing a nuclear plant and didn't seem to recognize its inadequate understanding.

Licensee inexperience resulted in inadequate staffing for the project. In addition to the lack of prior nuclear experience of the licensee as a corporation, the licensee appointed personnel without prior nuclear construction experience to key project positions. It was the first nuclear project for the licensee's Project Manager, Project Engineering Manager and Quality Assurance Manager. Licensee personnel interviewed indicated it was company philosophy in the early 1970s to promote from within the company and to hire young people out of college. Outsiders were brought into the company only in capacities the company did not have, such as nuclear engineers. Interviews with licensee personnel indicated that the licensee believed it was in the mainstream of their contemporaries in regard to staffing for the project. They had studied what other utilities were doing and found that in 1972 the leaders in the industry had about the same level of experience, which was an average of two to four years. Licensee personnel stated they had a bright, young, but inexperienced team, which, because of their inexperience, did not know how to expeditiously solve some of the problems that developed.

The licensee created the position of QA Manager in 1973 and filled the position with a nuclear engineer who had one year of quality assurance experience as a QA supervisor in industry before joining the licensee. There had not been a quality assurance position in the company, or a quality assurance program, before that time. The licensee established its quality assurance program because it was an NRC requirement. Prior to embarking on its nuclear program, the licensee had not been subject to NRC requirements and had not established a QA program of its own as a management tool. In 1977, the QA Manager became Manager of Construction for both fossil and nuclear plant construction and was replaced by a metallurgical engineer in the QA department, who had demonstrated management ability but who did not have nuclear QA experience. From 1972 to 1975 there was a staff of about 15 in QA/QC working on the two nuclear projects the licensee was involved in. In 1977, the Case D site had about seven licensee QA personnel.

An unusually long chain of command, consisting of three management levels at corporate offices, existed between the licensee site QA Supervisor and the Vice President of Power Plant Construction and Technical Services, who reported to the Executive Vice President. Apparently this long chain of command between relatively inexperienced personnel resulted in upper management's failing to receive the type of information needed to make decisions.

In 1973, the licensee Project Manager functioned as a coordinator between the licensee and the AE/CM/C, had a staff of three personnel, and tried to monitor engineering and procurement work. Construction work was the responsibility of the Construction Supervisor. Until 1977, the licensee received only milestone schedules from the AE/CM/C. In 1978, the licensee established a project team consisting of personnel from various departments matrixed to a Project Manager. Licensee personnel interviewed indicated that neither the licensee nor the AE/CM/C had effective project control systems to estimate project status and to control the project.

Licensee inexperience resulted in over-reliance on contractors. Historically, the licensee had depended upon its contractors to construct fossil power plants. While this approach may be adequate with contractors experienced in nuclear plant design and construction, it is not adequate with inexperienced contractors. The licensee placed more reliance on the AE/CM/C than the complexities of nuclear construction would justify and, in retrospect, was ineffective in oversight and control of the project. It took independent evaluations of the project for the licensee to understand the status of the project. The licensee indicated that the NRC Show Cause Order made it fully understand the severity of their quality-related problems.

Lincensee inexperience resulted in failure to recognize and understand that the problems encountered were symptoms of larger problems in the licensee's control of the project. Licensee personnel stated that the emphasis was on detail and no one was looking at the big picture. Review of NRC investigations revealed the licensee was responsive to specific NRC identified deficiencies and implemented corrective action in a timely manner. However, insufficient licensee management involvement at the detail level in the total scope of construction activities coupled with corporate and individual inexperience, was an apparent reason for procedural and programmatic inadequacies, which resulted in a failure to systematically identify problems and to routinely correct and prevent recurrence of problems.

Licensee personnel stated that the licensee was involved in providing direction to the project from the beginning but their experience level restricted the direction. They indicated they had greater involvement in the design area than in construction.

Licensee inexperience resulted in insufficient and unclear management direction and involvement, as evidenced by the ineffective project management system, and a diffusion of responsibility in the project to inappropriate levels of authority. For example, engineering changes were made by the AE/CM/C based upon QA/QC or licensee engineer's comments without approvals at appropriate levels of management.

While not suitably involved at higher levels, in some respects the licensee became too involved at lower levels. Licensee personnel became directly involved in the approval chain for design changes and other documents. This had the effect of unduly restricting work flow--everyone in the chain had veto authority and everyone had to agree to everything. Toward the end of the tenure of the initial AE/CM/C, the licensee stated it had assumed much of the contractor's responsibility for engineering work in an effort to correct the situation. In effect, the engineering work that was performed was the product of the AE/CM/C and the licensee instead of the product of the AE/CM/C with licensee overview.

2) <u>Inexperience of the AE/CM/C</u>

The AE/CM/C had previous experience as constructor at two nuclear plants but this was the first nuclear plant project in which the AE/CM/C had responsibility for design, construction management and construction. The licensee stated that the AE/CM/C also did not fully appreciate the difference in complexity between fossil and nuclear plants and lacked the necessary technical and management skills. The AE/CM/C inexperience was reflected in their starting and expediting construction before an adequate amount of design and engineering had been completed (estimated at less than 25%). The small amount of design and engineering completion resulted in an excessive amount of design evolution and rate of design change, according to licensee personnel. Licensee personnel indicated the AE/CM/C was accustomed to having total control of other projects and when the licensee attempted to impose their controls, the AE/CM/C was reluctant to accommodate them.

AE/CM/C inexperience as a corporation resulted in inadequate staffing for the project. In addition to the limited prior nuclear experience of the AE/CM/C as a corporation, the AE/CM/C appointed personnel without prior nuclear construction experience to key project positions. The licensee indicated that first level AE/CM/C management on the project had no prior nuclear experience nor did the principal AE staff. The licensee personnel interviewed indicated that design work proceeded slowly and was cumbersome, and that specifications and procedures were inadequate and in an unnecessarily complex format. They said the AE/CM/C lacked systems design capability and provided insufficient support for engineering design work. According to licensee personnel, QA/QC was accused of engineering the job and talent was not available in engineering to the depth required to turn QA/QC away. Licensee personnel also indicated there was insufficient engineering support for construction and insufficient communication between engineering and construction. They said capabilities that the AE/CM/C did have were channeled into those areas in which they had experience. The constructor had what was characterized as a "bulldozer mentality," that is the project operation was run by construction activities. Licensee personnel said that engineering efforts were scheduled based upon construction dictates, which led to unrealistic demands on the engineering groups, such as completing an engineering cycle of 18 months in two months.

The AE/CM/C inexperience resulted in insufficient and unclear management direction and involvement. Licensee personnel said that the former AE/CM//C's project management did not adequately define and provide for the interfaces and responsibilities for such functions as QA/QC, engineering design, and construction. As a result, the AE/CM/C did not react timely and effectively to the problems and did not have at their command the management systems to effectively establish the causes of problems and to prevent them from recurring. Licensee personnel indicated quality assurance and quality control were also dominated by construction. Many conflicts occurred between QA/QC and construction and construction generally won. The licensee indicated that as an overall complicating factor, it became clear in the mid-to-late 1970s that nuclear plant construction work in the U.S. was not going to increase as had previously been anticipated and it appeared that nuclear construction became a less desirable market area for the AE/CM/C. As a consequence, according to the licensee, the AE/CM/C reduced their commitment to this project, and many of their most capable personnel left this project for other nuclear projects or for positions in other industries.

B. <u>Inadequate Management Support for Quality</u>.

Neither the licensee nor the AE/CM/C appeared to have had an adequate understanding of quality and quality assurance concepts as they applied to nuclear plant design and construction. The licensee and the AE/CM/C were not use to functioning with quality assurance requirements. The licensee developed its quality assurance program in response to NRC requirements and the AE/CM/C had to rewrite its quality assurance program in order for the licensee to get their construction permit. Although both made commitments to quality, these were insufficiently supported through action. Neither the licensee nor the AE/CM/C staffed their key project positions with appropriately qualified and experienced personnel. In addition, there was a high turnover rate in AE/CM/C personnel assigned key site positions. Since 1977, there were six General Managers and seven Site Managers for the project. There was inadequate licensee and AE/CM/C project management to direct the project. The project lacked adequate QA, planning and scheduling and, according to licensee personnel, executive understanding of interfaces and responsibilities. Neither organization implemented sound management systems to prevent problems from recurring. The licensee was not appropriately involved in monitoring the total scope and details of activities and did not take effective corrective action to prevent recurrence of problems. The licensee relied heavily on the AE/CM/C and until 1980, did not have its own QC at the site. Until then, all corrective action requests were handled and tracked by the AE/CM/C. According to licensee personnel, corrective action requests were issued and closed out and the problems would recur. Licensee personnel stated they were aware of problems since 1973 and there was a continuous effort to get them corrected but no one was looking at the big picture. Allegations were continually made regarding harassment and intimidation of site QA/QC personnel and lack of support by inspection supervision. Audits to provide feedback to management concerning the effectiveness of the QA Program were improperly implemented and at times not performed. Audit reports were not issued beyond the level of the audited organization. No effective program had been implemented to perform trend analysis of nonconformance reports. There was an overall lack of aggressive implementation of effective QA/QC programs.

The licensee indicated that the AE/CM/C did not follow the principle of QA/QC independence from cost and schedule and as a consequence, construction supervisors dominated the QA/QC functions in the field. The AE/CM/C also did not take effective corrective action to prevent recurrence of problems. Published AE/CM/C policy emphasized minimizing cost and maintaining schedule and stated that QC inspector's decisions were subject to question, challenge and reversal.

The long chain of command between onsite QA functions and top licensee management resulted in a filtering of information and introduced inefficiencies into the decision making and implementing processes.

Although licensee personnel stated that management was involved in the project from the start, their actions resulted in low visibility for management support for quality, which tended to be interpretated as a lack of backing for quality from top management.

C. <u>Shortcomings in NRC's Licensing and Inspection Practices</u>

Opinions expressed by both regional and headquarters NRC personnel, as well as licensee personnel, suggest that in some respects the NRC could have been more effective in preventing or taking action earlier on the problems that occurred at this project. A recurrent theme in the interviews was that the NRC licensing process does not do enough to address the ability and experience of the project team as it relates to managing a nuclear construction project. The inspection process also tends to ignore management issues prospectively and tends not to address management issues until major technical, programmatic or quality problems have developed. The irregular presence of NRC inspectors at the job was cited as a problem, along with the observation by members of the licensee staff that there is a great lack of consistency among the various inspectors as to their capabilities, their interests, and the depth to which they pursue problems. The case study team discovered that the approach used by NRC in identifying and dealing with problems of the nature experienced by the Case D project was cumbersome and required excessive amounts of time. In effect, NRC's approach was to allow troublesome situations in construction to progress to the point at which a case could be built for taking the drastic action represented by a Show Cause Order. According to licensee personnel, some of the technical issues involving NRC headquarters required up to two years to resolve, and then the resolutions were too generic to be specifically useful.

Licensee personnel indicated that the rapid proliferation of regulations during the mid 1970s resulted in uncertainty in the regulatory process and a constantly changing target. Compliance with other (non-NRC) government requirements, such as not being able to refuse employment on the basis of drug or alcohol use or convictions of felonies, was also indicated by licensee personnel to have posed problems. It should be noted that although the project team of Case D experienced difficulty in adjusting to regulatory changes, others in the nuclear industry were apparently able to adjust.

Some members of the licensee staff strongly expressed the opinion that NRC policy decisions were based more on political than on technical considerations. They indicated their belief that the NRC personnel involved in the special investigation (79-19) were concerned with expediency and avoiding controversy at the risk of doing an inadequate technical job. The NRC identified problems before the special investigation that led to the Show Cause Order and the licensee had stopped construction in several areas of concern. It was felt that more inspection and forceful action by the NRC earlier in construction would have resulted in earlier detection of problems and more effective corrective action, which may have avoided the need for a Show Cause Order. Contrary to these views, several licensee management personnel expressed the view that the NRC had done the licensee a great favor in imposing the Show Cause Order because it made the licensee appreciate the significance of their problems and resulted in strong corrective actions.

Licensee personnel made a strong plea to depoliticize the NRC regulatory process and to replace the Commission with a single administrator. They expressed the view that, in the absence of such action coupled with a consolidation of the nuclear purview in Congress, further licensing and construction of nuclear plants would be virtually impossible.

D. Inability of Project Team to Adjust to Changing Nuclear Power Environment

During the design and construction of this project, the environment surrounding nuclear power in the U.S. underwent drastic changes.

One of the most obvious and significant of these changes was the proliferation of regulations imposed by the NRC. Other important changes occurred, however. One stemming in part from the increase in regulatory requirements has resulted in the necessity of a different role for the owner utility in nuclear plant design and construction; there has been a fundamental change in the level and degree of licensee management involvement in design and construction. Before the early 1970s, nuclear plants were often constructed with minimal licensee involvement on a turn-key basis. There are factors other than changing requirements that dictate the need for greater utility involvement in nuclear construction projects. With the increased costs and complexity of nuclear plants, overall individual project costs have soared near the full capitalized value of some utilities. This alone dictates a more active concern by licensee management to all phases of nuclear plant construction. A licensee is also drawn into more active involvement because of the heightened political concerns surrounding nuclear power that developed during the 1970s. Projections of declining energy needs, increasing costs of nuclear plants, and increasing interest rates made funding plant construction far more difficult. An increase in public skepticism and more active involvement of intervenors also occurred during the 1970s. Incidents within the industry, such as Three-Mile-Island and Brown's Ferry, have increased public concerned and resulted in significant regulatory change and design modifications. All of these changes, coming in rapid succession and imposed upon an inexperienced licensee-AE/CM/C coalition created a situation in which the licensee and the AE/CM /C were not effective in fully recognizing the significance of the changes as they occurred, in keeping up with changes, and in meeting the requirements of nuclear plant construction as they evolved during the 1970s.

Several personnel having prior nuclear design and construction experience and who have been assigned to the project after quality-related problems developed, expressed the following opinions:

1. There was a lack of clear management direction both on the part of the licensee and the engineer-contractor.
2. There was an incapacitating fusion of responsibility between and within each company.
3. Neither company had sufficient confidence in the other.
4. The document control systems of both concerns were inadequate.
5. Design evolution and the rate of design change were excessive.
6. Neither company had sufficient prior experience.

III. REMEDIAL ACTIONS TAKEN TO CORRECT CONSTRUCTION QUALITY PROBLEMS

Following the Show Cause Order and analysis of the project by an independent company, the main actions taken by the licensee to remedy the problems that occurred were to replace the AE/CM/C with two firms, one having architect engineer and construction management responsibility and the second having construction responsibility, and to increase the nuclear experience of its own staff through hireing. Both of these latter two firms have great depth of experience in nuclear plant design and construction. The system now being implemented is founded upon three general elements that characterize a good quality program. These are:

1. Considerable effort and thought devoted to planning.
2. An experienced project management team which includes balanced representation from the licensee, AE/CM and constructor.
3. Easily understandable and comprehensive procedures.

Significant features of the new system are as follows:

1. The constructor has cognizance for QA/QC but its QA reports to corporate headquarters offsite. At the time of the case study, the constructor QC organization consisted of approximately 140 people.
2. The AE/CM maintains an audit function that reviews all QA/QC done by the constructor. The AE/CM maintains a staff of 60 QA/QC personnel.
3. The licensee is very much involved but in an overview and monitoring role. They maintain a staff of about 30 QA/QC personnel, which is twice as many as were involved before 1981. This group monitors all QA/QC (design, construction, purchasing, document control, and records management) performed by the constructor and audited by the AE/CM.

   Internally, the licensee has made several changes. These include, in addition to shortening the chain of command, a highly increased and visible emphasis on quality. The licensee hired several well-qualified, nuclear design and construction experienced personnel, added their own quality control function at the construction site, personally reviewed and approved the hiring of many of the AE/CM and constructor personnel, reviewed and required modifications to the AE/CM and constructor QA/QC programs, and provided considerable assistance to both the AE/CM and constructor in hiring and relocating experienced personnel. Under the new system, the licensee Executive Vice President has been given full-time responsibility for the project and has removed intervening layers of management that previously separated him, as the responsible corporate officer, from the site QA function. The Executive Vice President meets with site QA personnel for detailed discussions at least monthly. The new system appears to have many redundancies, with the resultant diffusion of responsibilities. The licensee and present AE/CM and constructor management personnel have indicated that the new system, although still evolving and not fully tried, appears to be workable.

IV. GENERIC IMPLICATIONS

Based on the information reviewed and analyzed by the case study team, several possible generic implications, or lessons, emerge. These are highlighted in each of the case studies to provide input and to help form overall conclusions concerning factors that constitute important elements in nuclear plant construction quality. From the information considered by the case study team, several possible such implications emerged from this study:

A. Understanding of Nuclear Project and its Implications

It is essential that licensees and contractors understand the differences in complexity between construction of fossil and nuclear power plants and the implications associated with the difference. Nuclear plant construction is more complex and demanding than fossil plant construction and licensees and contractors must provide a strong, experienced organization possessing the necessary management skills to effectively manage the project. Although experienced contractors for design and construction activities may be involved, the licensee is fundamentally responsible for the safe construction of the plant. Given the complexity of these projects and the major implications of failures, the licensee must, in his own self defense, implement effective review, surveillance and audit of all phases of activity. Stated commitments to quality must be supported by positive actions.

B. Nuclear Experience Vital Today

The complexity, cost, regulation and safety requirements of nuclear plant construction makes it vital that the project team have prior nuclear design and construction experience before embarking on a new project. Not all corporate members of the project team must have prior nuclear experience, but collectively, as organizations and individually, they must have it. This experience must be manifest at all working and management levels. In the absence of this kind of competence and experience, a licensee will be unable to recognize when problems are occurring, accurately assess their importance and devise approaches to solve them effectively. In the opinion of licensee personnel interviewed in this case study, the NRC would be doing the utility that lacked this capability a great favor by denying them a construction permit.

C. Management Awareness and Involvement Necessary

The need for management involvement and support at the highest levels in nuclear plant construction is well illustrated by this case. Top-level involvement is important whether the licensee and its contractors have nuclear experience or not. High-level involvement is required from the licensee, the AE, the CM, the constructor, and other contractors involved in the project to assure timely recognition and effective resolution of problems. A well-defined and effective decision making process followed by everyone involved eliminates the reality as well as the perception of indecision and provides needed direction. The requisite commitment to project objectives must be incorporated into all working guidelines as clearly stated approaches that are easily understood at all management and working levels.

Licensee management must interface actively with contractor management to assure that the licensee becomes aware of problems and their impact in a timely way so that their solutions can be effectively initiated. Management support for quality must conspicuously emanate from the tops of the licensee and contractor organizations and permeate all phases of activity. If top-level management fails to visibly support quality, the perceived importance of quality diminishes and introduces tendencies to emphasize cost and schedule goals to the detriment of quality. Management support must be implemented as well as verbalized, preferably through active and frequent involvement of top management with project management functions, including quality.

D. Need Qualified, Capable People

Qualified people with indepth nuclear design and construction experience are required at all levels for the construction project to be successful. Qualifications extend to education, training, and experience acquired on previous projects and should be supplemented by training, by the licensee or his contractor. Personnel qualification requirements extend to the licensee as well as to the contractors. Without suitable qualifications, licensee employees will not be able to adequately assess the contractors' work, or the contractors their own work.

E. Ultimate Responsibility Retained by Licensee

The licensee is ultimately responsible for a nuclear plant's construction and safe operation. Although the licensee may contract design, construction, and other activities to other organizations and may impose responsibilities on these organizations for complying with regulatory requirements, construction permits and operating licenses are issued to utilities and not to their contractors. The licensee has ultimate responsibility for successful construction and safe plant operation. In its self defense, it must implement adequate controls to verify that its contractors comply with all requirements.

V. IMPLICATIONS OF CASE STUDY D FOR NRC QA INITIATIVES

NRC has under way several initiatives which are designed to establish additional confidence in the quality of design and construction activities, to improve the management control of quality, and/or to improve NRC's capability to evaluate the implementation of licensee programs. The initiatives are described in the NRC staff paper SECY 82-352, "Assurance of Quality," and subsequent correspondence between the Commission and the NRC staff. One of the purposes of this case study is to provide feedback on the relevance of the various initiatives to the Case D licensee's nuclear construction project. The following paragraphs discuss whether each initiative, had it been an ongoing activity at the time of CP issuance and up to NRC confirmation of the magnitude and nature of this projects design and construction problems, would have made a difference, that is, would the initiative have prevented or at least mitigated the design and construction problems that were discussed earlier. A more complete discussion of the scope and details of the various NRC-QA initiatives may be found in SECY 82-352 and SECY 83-32, "First quarterly report on Implementation of the Quality Assurance Initiatives." Most of these initiatives were discussed with the senior management of the licensee, his current AE/CM, and his current constructor. No discussions were held with personnel from the original AE/CM/C.

A. Measures for Near-Term Operating Licenses (NTOL)

1. Licensee self-evaluation - not applicable

This initiative applies to actions that would occur when the licensee is in the process of receiving his operating license. It requires that the licensee examine selected portions of the engineering design or construction. Licensee self-evaluation permits an evaluation of the project from beginning to end and would permit the Chief Executive Officer to state that the plant had been built according to its commitments. In the Case D situation, construction had not proceeded to the point where a self-evaluation would have been appropriate. Therefore, this initiative would have had no effect.

2. Regional evaluation - no

The licensee regional evaluation is an action that would occur when the licensee is in the process of receiving its operating licensee. For Case D, the operating license phase was well beyond the point in time where the problems discussed previously occurred. As a result, this initiative would have had no effect in Case D.

3. Independent Design Verification Program (IDVP) - no

The licensee IDVP is an action that occurs when the licensee is in the process of receiving its operating license. Construction had not proceeded to this point and, as a consequence, this initiative would have had no effect. Had such a verification been performed for this project before serious problems were discovered, it may have been effective in revealing the inadequate state of design completion and may have identified other engineering deficiencies. The licensee indicated that a continuous review of engineering work should be performed--not just a review at the end of construction and before the operating license is granted.

B. Industry Initiatives

1. INPO "Construction" audits - yes

INPO construction assessments potentially would have identified procedural and programmatic inadequacies that were not evident to the inexperienced licensee or his contractor.

2. Utility Self-Initiated Evaluation Using INPO Method - maybe

Applying the INPO criteria would likely have identified inadequacies; however, because of the nuclear inexperience of the licensee and his contractors, they may not have correctly characterized the extent, nature and seriousness of them, and probably would not have identified adequate corrective action to be taken in response to these revealed deficiencies.

C. <u>NRC Construction Inspection Program</u>

1. Revised procedures and increased resources - yes

Revision of NRC inspection procedures to shift emphasis from review of records to work observation and inspection and an increase in NRC resources allocated to construction inspection may have detected the problems at an earlier stage of construction.

In the exit conference, the licensee suggested that a resident inspector should be present onsite for each discipline and that the NRC needs more resident inspectors or roving inspection teams to support all disciplines. Licensee personnel also indicated that the competence of NRC staff must be upgraded to be equal to that of the utilities and the architect engineers. The licensee felt that the resident inspector's presence onsite was very important on a day-by-day basis.

2. Construction Appraisal Team (CAT) Inspection - (emphasis on management) yes

A CAT inspection conducted before the Show Cause Order would likely have detected programmatic and procedural inadequacies in the project, pointing to shortcomings in project management. Because of the intensity of these special team inspections, they yield a comprehensive overview of a project sooner than the NRC inspection program. A CAT would have been particularly valuable in determining the construction inadequacies characteristic of the Case D project. Because CAT inspections are performed only at about four plants under construction per year, this or any particular plant may not have been selected. Present CAT inspections focus on the quality of hardware, and on this basis, inferences may be drawn about the quality of management. A modified CAT that addressed the management issues more directly would have been even more beneficial.

3. Integrated Design Inspection - yes

The integrated design inspection is an activity that would normally occur while the licensee is receiving its operating license. It could be done earlier, however. Such a design inspection would likely have revealed inadequacies in design control and the lack of systems engineering in Case D. It also likely would have showed that insufficient engineering support was available for construction and that engineering design was not sufficiently far along to permit construction to proceed.

4. Evaluation of Reported Information - maybe

This initiative would computerize 10 CFR 50-55c and Part 21 reports, facilitating trend and other analyses of these event reports. Such an analysis would have provided an additional cross-check on the quality-related operations at the construction site. Evaluation of reported information from all licensees could have been effective in alerting the NRC or licensee upper management in Case D to impending problems.

D. Designated Representatives - probably not

The FAA designated representative program utilizes contractor or licensee individuals to represent the regulatory agency in the field. This activity is generally considered to apply to the production process but could be construed to apply to design or other manufacturing activities as well. If NRC were to adopt such a program, the designated representative would be an individual employed by the licensee, architect engineer, constructor or other firm external to the NRC. In Case D, the inexperience of the licensee and their original AE/CM and the inability of the Licensee to effectively correct procedural and programmatic deficiencies suggest that a designated representative chosen from their ranks would have had little effect in preventing the quality problems that occurred. The licensee's view of designated representatives was that they would erode responsibility for quality at the working level and may result in NRC assuming an inordinate share of the responsibility for quality.

E. Management Initiatives

1. Seminars - yes

Seminars such as those conducted by the NRC or INPO in the past as well as presentations by utility executives who have had construction-related problems would have been helpful in increasing the licensees' management awareness of the importance of project management capability, prior nuclear experience, recognition of symptoms and quality control measures in construction. Such presentations would have been particularly useful for the Case D project because of the inexperience of both the licensee and the original AE/CM/C and could have resulted both in more active and effective involvement of the licensee and an improved approach on the part of the AE/CM/C towards quality control and quality assurance.

2. Qualifications/Certifications of QA/QC personnel - probably not

   The working level QA/QC personnel involved with construction were basically qualified. They did identify problems but were not effective in correcting these because of the procedural and programmatic shortcomings of the licensee and the AE/CM/C. A greater degree of qualification or certification of QA/QC personnel may have resulted in earlier and more indepth awareness of the problems, but it is doubtful whether this awareness would have been effective in solving the problems.

3. Craftsmership - probably not

   The licensee indicated the AE/CM/C was a non-union employer with a reputation as a training ground for craftsmen. They paid relatively low wages but provided individuals the opportunity to gain the experience they needed to move into unionized organizations where wages were higher. However, it does not appear that this was an important factor in the quality problems. The inability of the licensee and the AE/CM/C to effectively manage the project, the inadequacy of specifications and procedures and design completion not being adequately ahead of construction were much larger contributing factors.

VI. IMPLICATIONS OF CASE STUDY D FOR THE FORD AMENDMENT ALTERNATIVES

Section 13 to the NRC's FY 1982-1983 Authorization Bill requires NRC to study existing and alternative programs for improving quality assurance and quality control at nuclear power plants under construction. This section, called the Ford Amendment, requires NRC to look in particular at the feasibility and efficacy of five specific alternative program concepts. As part of this analysis, each alternative concept was evaluated as to whether it would have made a difference in the Case D project had it been in place at the time of the issuance of the construction permit up to issuance of the Show Cause Order. Each alternative was discussed with senior licensee, AE/CM, and constructor management personnel. No discussions were held with personnel from the original AE/CM/C. The results of the discussions are given below.

A. More Prescriptive, Architectural and Engineering Criteria - perhaps

The Authorization Act requires NRC to evaluate the following alternative:

13(b)1 - Adopting a more prescriptive approach to defining principal AE criteria for constructing commercial nuclear power plants that would be a basis for quality assurance and quality control, inspection, and enforcement actions.

The design and construction problems were not affected by the degree of prescriptiveness of the AE criteria. More prescriptive AE criteria would not have corrected the procedural, programmatic and management deficiencies noted in case D. However, being prescriptive in the degree of engineering completion prior to the start of construction may have eliminated insufficient engineering support for construction and the scheduling of engineering efforts based upon dictates from construction. Licensee personnel indicated more prescriptive criteria would be good provided the methods of complying with the criteria were left to the licensee, AE/CM, and constructor. To make decisions, the requirements must be clearly known. A need for clearly described standard construction methodologies that would prevent known problems from recurring at other sites was also expressed.

B. Conditioning the Construction Permit on the Applicants' Demonstration of His Ability to Manage an Effective Quality Assurance Program - yes

The Authorization Act requires NRC to evaluate the following alternative:

13(b)2 - Requiring as a condition of the issuance of construction permits for commercial nuclear plants that the licensee demonstrate the capability of independently managing the effective performance of all quality assurance and quality control responsibilities for the plant.

Imposing this requirement would almost certainly have identified the lack of nuclear experience, lack of management understanding, and the programmatic and procedural inadequacies that affected the project, before initiation of construction. It should have resulted in shortening the chain of command, in identifying the need for more experienced personnel at all levels, and in demonstrating the inherent lack of prior nuclear experience.

C. Audits, Inspections or Evaluations by Associations of Professionals Having Expertise in Appropriate Areas - Management Audits - yes

The Authorization Act requires NRC to evaluate the following alternative:

13(b)3 - Encouraging and obtaining effective evaluations, inspections, or audits of commercial nuclear power plant construction by independent industry or institutional organizations based on best experience and practices.

Overviews of this nature should have been effective in identifying procedural and programmatic inadequacies and should have resulted in earlier management awareness of the existence and magnitude of problems. It should be noted that the licensee did have evaluations performed during the early phases of the project to determine construction status. Later evaluations were performed to determine quality-related information and design adequacy. The licensee took action based upon these evaluations and likely would have taken action based upon inadequacies and deficiencies discovered by associations of professionals. In mid-1983 the licensee had an audit of design and construction performed, using INPO criteria, by a team of 18 individuals representing five different organizations.

D. Improvement of NRC's QA Program - yes

The Authorization Act requires NRC to evaluate the following activities:

13(b)4 - Re-examining the Commissions' organization and method for quality assurance development, review, and inspection with the objective of deriving improvements in the agency's programs.

Requiring that the licensee demonstrate his ability to manage a nuclear construction project and assessing the demonstration of implementation of licensee and AE/CM/C QA/QC programs would have been helpful in earlier identification of the shortcomings experienced by the Case D project. The approval of a licensees' program description in a PSAR is not sufficient evidence that he has fulfilled his commitments. The fact that a program complying with requirements has been written and documented in the PSAR says little about the subsequent successful implementation of that program. Earlier appointment of a resident inspector (a full-time resident inspector arrived at the Case D site in 1979--four years after construction began) would have been helpful. In particular, involving an inspection team with expertise in each required discipline earlier in the project would have been beneficial.

The Licensee indicated proliferation of regulations as a factor in causing the case D problems. They indicated that altering the NRC program to stabilize the regulatory base would be beneficial in avoiding such problems in the future.

E. Conditioning the Construction Permit on the Applicant's Commitments to Submit to Third Party Audits of its Quality Assurance Program - yes

The Authorization Act requires NRC to evaluate the following alternative:

13(b)5 - Requiring as a condition of the issuance of construction permits for commercial nuclear power plants that the applicant enter into contracts or make other arrangements with an independent inspector for auditing quality assurance responsibilities for the purposes of verifying quality assurance performance. An independent inspector is a third party and has no responsibilities for the design and construction of the plant.

This alternative as it applies to Case D is closely related to Alternative 13(b)3 discussed above. If this initiative had been in place, problems may have been detected earlier and the errors that occurred may not have developed into a project breakdown. Audits of this type, had they been in place at the time, should have identified programmatic and certain procedural inadequacies and should have resulted in earlier upper management awareness of the problems. The licensee did respond favorably to self-initiated evaluations and could be expected to respond similarly to inadequacies and deficiencies reported by an independent auditor. A comprehensive audit by a qualified independent inspection team should have identified the incompatibilities that arose between design, construction and quality control.

ATTACHMENT 1
PART A

HOUSTON LIGHTING AND POWER COMPANY
QUALITY ASSURANCE PROGRAM DESCRIPTION

SOUTH TEXAS PROJECT ELECTRIC GENERATING STATION
QUALITY ASSURANCE DURING DESIGN AND CONSTRUCTION

OCTOBER 31, 1980

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HOUSTON LIGHTING & POWER COMPANY
QUALITY ASSURANCE PROGRAM DESCRIPTION

Table of Contents

HOUSTON LIGHTING & POWER COMPANY
QUALITY ASSURANCE PROGRAM DESCRIPTION

List of Tables

List of Figures

ATTACHMENT 1

QUALITY ASSURANCE PROGRAM DESCRIPTION

South Texas Project Electric Generating Station

Quality Assurance During Design and Construction

Houston Lighting & Power Company (HL&P), as a licensee and as Project Manager for itself and the other owners, has quality assurance responsibility for design, engineering, procurement, fabrication, construction and operation associated with the South Texas Project Electric Generating Station (STP). Although HL&P has delegated certain of its quality assurance authority to its contractors, it nevertheless retains the responsibility for the quality assurance program controlling all aspects of the STP. As an initial step in fulfilling its responsibility, HL&P establishes quality assurance requirements for the project in a Project Quality Assurance Plan. The Project Quality Assurance Plan specifies requirements applicable to prime contractors and HL&P. The HL&P quality assurance staff monitor the performance of HL&P staff and contractors to assure compliance with the Project Quality Assurance Plan.

HL&P has contracted with Westinghouse Electric Corporation (Westinghouse) for the design, fabrication and quality assurance services for the nuclear steam supply system and with Brown & Root, Incorporated (B&R) for plant design, construction, quality assurance services and other related services, including quality assurance services for Westinghouse items upon receipt at the project site. This quality assurance program description addresses the HL&P quality assurance program (Part A) and the quality assurance program of B&R (Part B). The Westinghouse quality assurance program is described in WCAP-8370, "Westinghouse Nuclear Energy System Divisions Quality Assurance Plan" and is not included in this program description.

ATTACHMENT 1
PART A

HOUSTON LIGHTING & POWER COMPANY
QUALITY ASSURANCE PROGRAM DESCRIPTION

South Texas Project Electric Generating Station
Quality Assurance During Design and Construction

Houston Lighting & Power Company (HL&P), as a licensee and as Project Manager for itself and the other owners, has the Quality Assurance (QA) responsibility for design, engineering, procurement, fabrication, construction, preoperational testing and operation of the South Texas Project (STP) Electric Generating Station.

HL&P's Quality Assurance Plan requires that HL&P, its prime contractors, subcontractors and vendors comply with the criteria established by 10CFR50 Appendix B. It is the intent of HL&P to comply with ANSI N 45.2 and the applicable daughter standards and implementing Regulatory Guides. Furthermore, HL&P will assure through programmatic direction that the Engineer/Constructor and all its subcontractors and suppliers performing nuclear safety-related work comply with 10CFR50 Appendix B, ANSI N45.2, and the Regulatory Guides as referenced herein consistent with their scope of work.

Programmatic direction is defined as the role of the owner in establishing the program requirements and ensuring the adequacy of the contractor's Quality Assurance Program. The programmatic direction consists of review and approval of the system features initially and continued monitoring of those systems during implementation and further refinement or revision of the systems if the systems need strengthening. The assurance of compliance by first level nuclear safety-related suppliers will be accomplished through the Engineer/Constructor's review and approval of the supplier's Quality Assurance Program.

Implementation reviews are performed by HL&P Discipline Quality Assurance personnel using prepared checklists to evaluate the effectiveness of compliance to the Quality Assurance program at the South Texas Project site during construction. The implementation reviews use techniques such as interviews with personnel performing the activities, observations of actual work in progress, and reviews of final form. Implementation reviews are performed by qualified personnel based on experience, educational level, training, and proficiency examinations. Certifications are issued for specific discipline oriented activities.

Inspection verifications are performed by qualified (ANSI N.45.2.6/ASNT-TC-1A) HL&P Quality Control personnel to determine the effectiveness of Brown & Root inspection planning documents. The inspections will consist of witness points during regular Brown & Root processing sequences and special task oriented inspections (nonconformance closeout, followup investigations into problem areas) as requested by HL&P Discipline Quality Assurance.

The HL&P Quality Assurance program is implemented in two phases. The design and construction phase as defined by the Project Quality Assurance Plan and the operational phase as defined by the Operational Quality Assurance Plan. The Project QA Plan is described herein. The Operational QA Plan is described in Chapter 17.2 of the FSAR.

The combination of these Quality Assurance programs augmented by definitive procedures provide HL&P with the assurance that its quality commitments are met.

1.0 Organization

1.1 The organization chart shown in figure 1 illustrates: (a) groups within HL&P having quality responsibilities (engineering, procurement, construction) and (b) Quality Assurance interdepartmental relationships for the South Texas Project.

1.2 The Manager, South Texas Project Quality Assurance is responsible for providing the programmatic direction, and administering policies, goals, objectives and methods which are described in the Project Quality Assurance Plan. The HL&P Executive VicePresident reviews and approves the Project Quality Assurance Plan and has ultimate responsibility for Quality Assurance activities. The Project Quality Assurance Plan interfaces with the corporate Quality Assurance program objectives by describing specific Quality Assurance controls to be established by HL&P and the prime contractors on the South Texas Project.

1.3 Two levels of control have been implemented by HL&P to monitor the effectiveness of the Quality Assurance Programs at the South Texas Project: (1) Corporate level control relates to the overall activities and performance of HL&P, B&R, subcontractors and suppliers. This is administered through the direct involvement of the HL&P Executive Vice-President and through audits of project activities. (2) Project level control relates to monitoring the specific activities and performance of HL&P, B&R and its subcontractors. This is accomplished through review of documents, implementation reviews, and, inspection verifications that establish QA system features (e.g. procedures, specifications).

1.3.1 Manager, South Texas Project Quality Assurance

The Manager, South Texas Project Quality Assurance reports on all technical and administrative matters directly to the Executive Vice-President of HL&P. This organizational arrangement provides independence from cost and scheduling influences.

The Manager, South Texas Project Quality Assurance must, as a minimum, have:

(1) A college degree in a field of engineering or science, or equivalent experience

(2) Familiarity with nuclear power generation facilities and related operations

(3) Knowledge of the Quality Assurance standards and regulatory requirements

(4) Management experience and familiarity with HL&P Corporate Organizations.

The major responsibilities of the Manager, STP QA are:

(1) Administer QA policies established by management and ensure the proper planning, development, implementation, coordination and administration of the Project Quality Assurance Plan.

(2) Provide programmatic direction on QA related matters to HL&P and contractor management and interface with NRC.

(3) Coordinate activities relating to auditing and vendor surveillance in conjunction with the HL&P Houston Quality Assurance Manager.

The Manager, South Texas Project Quality Assurance has the authority to solve quality related problems and to verify the implementation and effectiveness of the solutions. He has the authority to "Stop Work" for cause on any quality-related activity of the South Texas Project.

1.3.2 Houston Quality Assurance Manager

The Houston Quality Assurance Manager reports on all technical and administrative matters directly to the Executive Vice-President of HL&P. This organizational arrangement provides independence from cost and scheduling influences.

The Houston Quality Assurance Manager is responsible for directing all HL&P Houston office auditing, vendor surveillance and technical support activities. He has the authority to "Stop Work" for cause on any quality-related activity of the South Texas Project.

The Houston Quality Assurance Manager as a minimum, has:

(1) A college degree in a field of engineering or science, or equivalent experience.

(2) Familiarity with nuclear power generation facilities and the related operations.

(3) Knowledge of the industry's Quality Assurance standards and regulatory requirements.

(4) Management experience and familiarity with HL&P Corporate Organizations.

The major responsibilities of the Houston Quality Assurance Manager are:

(1) Provide administrative guidance and direction for the HL&P Quality Assurance Audit Program.

(2) Direct the HL&P vendor surveillance programs.

1.3.3 Project Quality Assurance General Supervisor

The Project Quality Assurance General Supervisor reports directly to the Manager, South Texas Project Quality Assurance. He is responsible for technical direction and administrative guidance to the discipline Quality Assurance personnel, providing programmatic direction to B&R and interfacing with the NRC. He has the authority to "Stop Work" for cause on any activity related to fabrication and construction.

1.3.4 Supervisor, Quality Systems

The Supervisor, Quality Systems reports directly to the Manager, South Texas Project Quality Assurance. He is responsible for providing technical direction and administrative guidance to the site Quality Systems personnel; developing and administering the HL&P Project QA Plan; evaluating the B&R QA/QC program; administering the HL&P STP QA personnel training and certification program; administrative control of HL&P quality assurance procedures and providing mechanisms to correct the QA programs as necessary. He has the authority to "Stop Work" for cause on any activity related to fabrication or construction.

1.3.5 Supervisor, Quality Control

The Supervisor, Quality Control reports directly to the Manager, South Texas Project Quality Assurance. He is responsible for technical direction and administrative guidance to the Quality Control personnel, coordinating inspection of selected fabrication and construction activities, ensuring proper nonconformance identification and assuring that the personnel performing inspections are properly certified. He has the authority to "Stop Work" for cause on any activity related to fabrication or construction.

1.3.6 Discipline Project Quality Assurance Supervisors

The Discipline Project Quality Assurance Supervisors report to the Project Quality Assurance General Supervisor. They are responsible for technical direction and administrative guidance to the Discipline Quality Assurance personnel in their respective discipline group; coordinating implementation reviews; interface with NRC during audits; identifying deficiencies; reviewing and approving procedures applicable to their respective discipline; and providing programmatic direction to B&R. They have authority to "Stop Work" for cause on any activity related to fabrication or construction.

1.3.7 Procurement Project Quality Assurance Supervisor

The Procurement Project Quality Assurance Supervisor reports directly to the Manager, South Texas Project Quality Assurance. He is responsible for providing technical direction and administrative guidance to procurement Quality Assurance personnel, coordinating the resolutions of vendor problems identified by HL&P, coordinating with site discipline Quality Assurance functions for input to vendor surveillance/audit activities and providing programmatic direction to B&R regarding vendor surveillance and auditing functions. He has the authority to "Stop Work" for cause on any activity related to engineering, design, or procurement.

1.3.8 Manager, South Texas Project

The Manager, South Texas Project reports to the HL&P Vice-President, Nuclear Engineering and Construction. He has overall responsibility for the engineering, construction, procurement, cost, schedule, and startup of the South Texas Project. He has authority to "Stop Work" for cause in all activities of the project.

1.3.9 Project Manager, Houston Operation

The Project Manager, Houston Operation reports to the Manager, South Texas Project. He is responsible for engineering, procurement, project control services, accounting and project administration. He has the authority to "Stop Work" for cause in activities related to engineering, design, or procurement.

1.3.10 Project Engineering Manager

The Project Engineering Manager reports to the Project Manager, Houston Operation. He directs project engineering personnel in the performance of an owner's review of the design and engineering work performed by the prime contractor. The Project Engineering Manager ensures that adequate engineering planning and coordination of solutions to problems and work priorities are established by the prime contractor. He can recommend "Stop Work" for cause in the engineering and design of all items.

1.3.11 Supervising Project Engineer, Houston Engineering

The Supervising Project Engineer, Houston Engineering reports to the Project Engineering Manager. He is responsible for directing the Houston engineering interface with the prime contractor. This work includes engineering planning, coordination of solutions to problems, and work priorities. He can recommend "Stop Work" for cause in the engineering and design of all items.

1.3.12 Supervising Project Engineer, Site Engineering

The Supervising Project Engineer, Site Engineering reports to the Project Engineering Manager. He is responsible for coordinating the site engineering interface in the technical resolution of all site related engineering problems, reviewing field change requests, and site-initiated design change notices. He assists in the release and interpretation of design documents. He can recommend "Stop Work" for cause in the engineering and design of all items.

1.3.13 Leader, Engineering Administration

The Leader, Engineering Administration reports to the Project Engineering Manager and he is responsible for the preparation, control and maintenance of engineering manuals and documents.

1.3.14 Project Site Manager

The Project Site Manager reports to the Manager South Texas Project. He is responsible for providing technical direction and administrative guidelines to HL&P and its prime contractors in the area of construction, site purchasing, security, startup, accounting, construction control and engineering, and reviewing for approval documents, drawings and specifications related to construction. He has the authority to "Stop Work" for cause in all activities related to construction.

1.3.15 Construction Superintendent

The Construction Superintendent reports to the Project Site Manager. This position is responsible for ensuring that the prime contractor complies with all contractual and construction requirements, evaluates and ensures that work is preplanned, that work packages are being utilized in a timely and effective manner and provides recommendations to construction activities.

1.3.16 Construction Engineering Supervisor

The Construction Engineering Supervisor reports to the Construction Superintendent. He is responsible for providing technical support to all HL&P Site Area Supervisors, overseeing construction operations, ensuring that work scopes are evaluated and problem solutions are carried out.

1.3.17 General Construction Supervisor

The General Construction Supervisor reports to the Construction Superintendent. He is responsible for monitoring and surveillance of the prime contractor's construction activities, expediting the resolution and corrective actions of problems identified by QA/QC and verifying that construction planning includes requirements for inspection and testing.

1.3.18 Project Purchasing Manager

The Project Purchasing Manager reports to the Project Manager, Houston Operations. He is responsible for the overall coordination and administration of purchasing and subcontracting activities for the South Texas Project including the development and implementation of procedures, vendor selection, contract negotiations and preparing purchase orders.

1.3.19 Supervisor of Project Purchasing

The Supervisor of Project Purchasing reports to the Project Purchasing Manager. He is responsible for the development and implementation of procedures related to purchasing and subcontractor negotiations. He assists in the detection and resolution of procurement problems.

1.3.20 Contract Administrator

The Contract Administrator reports to the Project Purchasing Manager. He is responsible for preparing the scope of contracts, implementing procedures and reviewing invoices to assure contract compliance. He participates in contract negotiations, contract changes and operation audits to ensure contract compliance.

1.4 The delegations of Quality Assurance authority for the South Texas Project are as follows:

a. Houston Lighting & Power Company as a licensee and Project Manager for itself and the other owners has the overall responsibility for design, engineering, procurement, construction, operation and quality assurance activities. Brown & Root has contractual responsibility to provide an acceptable QA program to HL&P. The contract provides HL&P the authority to audit and monitor Brown & Root's performance to assure that its Quality Assurance Program has sufficient authority and organizational freedom to be effectively implemented.

b. Brown and Root, Inc. as the architect/engineer and constructor provides HL&P with design, engineering, procurement, construction, and quality assurance services.

c. Westinghouse Electric Corporation as the Nuclear Steam Supply System (NSSS) supplier provides HL&P with the NSSS design engineering, procurement, fabrication, and quality assurance.

d. Consultants - HL&P utilizes the services of qualified consultants to assist in the performance of quality tasks.

Figure 2 illustrates how these companies interrelate with HL&P for the South Texas Project.

2.0 Quality Assurance Program

2.1 The HL&P Project Quality Assurance program for the South Texas Project has been developed in accordance with the criteria of 10CFR50 Appendix B, ANSI N45.2 and Regulatory Guides as referenced herein, to provide programmatic direction on quality requirements for the prime contractors and subcontractors during design and construction.

2.2 The nuclear safety-related structures, systems and components covered by this program are listed in Section 3.2 of the FSAR. Westinghouse Electric Corporation provides quality assurance services for the items listed in Table 3.2.B-1 of the FSAR until delivery to the site. Brown and Root provides quality assurance services for the items listed in Table 3.2.A-1 of the FSAR and responsibility for the Westinghouse items (Table 3.2.B-1) upon receipt at the site.

2.3 The HL&P Quality Assurance program for the South Texas Project is described by the HL&P Project Quality Assurance Plan. The plan requires that written procedures, training and certification, issuance of specifications and drawings, and work and inspection planning be accomplished in advance of performing nuclear safety-related activities. HL&P Project Quality Assurance ensures through procedure reviews that this advance preparation is accomplished.

The Project Quality Assurance Plan for the South Texas Project (STP) is structured in accordance with the Regulatory Guides (RGs) and Industrial Standards that are addressed in the NRC publications "Guidance on QA Requirements During Design and Procurement Phase of Nuclear Power Plants," (The Gray Book) Revision 1, dated May 24, 1974 (WASH 1283) and "Guidance on QA Requirements During the Construction Phase of Nuclear Power Plants," (The Green Book) dated May 10, 1974 (WASH 1309) as listed by Table 2.

2.4 The HL&P Plans and Procedures which are used to implement the quality related activities for each major organization and the reference to the applicable criteria of 10CFR50 Appendix B are listed in Table 1. Verification that plans and procedures are properly implemented is accomplished by HL&P Quality Assurance through audits, implementation reviews, inspection verifications, and regular management assessment of the Quality Assurance Program.

2.5 It is the policy of HL&P acting as a licensee and Project Manager for the other owners for the South Texas Project Electric Generating Station (STPEGS) to assure that the design, fabrication, construction, testing, and operation of STP are in conformance with project specifications, procedures, codes, and NRC regulations. It is the responsibility of each organization assigned to the STPEGS to ensure that project procedural review methods include provisions to ensure that the requirements stated in this manual are incorporated into project procedures. The Project Quality Assurance Plan establishes activities and procedures which identify, initiate and verify the resolution of nuclear safety-related quality problems. The implementing procedures call for the resolution of quality problems at the lowest possible authorized level. However, if a dispute is encountered in the resolution of a quality problem which cannot be resolved at lower levels, the HL&P Manager, South Texas Project Quality Assurance presents the problem ultimately to the HL&P Executive Vice-President for resolution.

2.6 South Texas Project Quality Assurance is responsible for conducting a quality oriented indoctrination program for new personnel that have quality-related functions. The HL&P Project Quality Assurance Plan requires that prior to performing activities affecting quality the personnel are trained in the applicable procedures. The training provides a thorough understanding of the purpose, scope, policies, principles, and techniques of the specific procedures or instructions. When personnel perform special process activities, a training and certification program is established and maintained. Refresher training is conducted to ensure that proficiency is maintained. B&R is required to establish a training program including refresher training to ensure proficiency is achieved and maintained. This B&R training is addressed in Section 2.2.3 of the revised Brown & Root Quality Assurance Program Description. HL&P Quality Assurance audits are performed to ensure compliance with these criteria.

2.7 The Manager, South Texas Project Quality Assurance and the Houston Quality Assurance Manager are directly responsible for assuring effective implementation of the Quality Assurance program. The qualifications for these positions are defined in Section 1.3.

2.8 The HL&P Project Quality Assurance Plan requires the prime contractor (B&R) to submit all procedures which control nuclear safety-related construction activities to HL&P Project Quality Assurance for review and approval. It is the responsibility of HL&P Project Quality Assurance to determine that the prime contractor's procedures require proper equipment, environment and other prerequisites to perform the associated activity. These requirements are verified through implementation reviews by HL&P Discipline QA, inspection verification by HL&P QC and audits by HL&P Houston QA.

2.9 The results of the HL&P QA/QC and audit activities are presented in a monthly report to the HL&P Executive Vice-President. Regular executive management review of the monthly activities and the direct involvement of the HL&P Executive Vice-President assures that an objective program assessment of the South Texas Project Quality Assurance programs is being performed.

HL&P STP Quality Assurance reviews and documents concurrence with the B&R Quality Assurance manual and audits are performed by HL&P Houston Quality Asssurance to ensure compliance.

2.10 HL&P and Brown & Root Project Quality Assurance are in the process of establishing and documenting a program for transferring responsibilities and controls for quality-related activities from B&R to HL&P during phaseout of design/construction and during preoperational testing and plant turnover. This program will be implemented prior to preoperational testing.

2.11 HL&P is committed to maintaining the Project Quality Assurance Plan as an effective and meaningful document to provide directions to HL&P and the prime contractors on the South Texas Project. When proposed substantive changes to this Project Quality Assurance Plan affect the docketed Quality Assurance Program description, HL&P will notify the NRC of the change(s) for their review and acceptance prior to implementation. Organizational changes of a substantive nature will be reported to the NRC within 30 days of announcement.

3.0 Design Control

HL&P has the overall responsibility for design and engineering of the South Texas Project and imposes the requirements of 10CFR50, Appendix B, Criterion III, Regulatory Guide 1.64 (Rev. 2) and ANSI N45.2.11-74 on the prime contractors and applicable subcontractors. HL&P contractors are required to provide the following design control measures in their quality assurance programs:

(1) A design control system is established to document the methods of accomplishing and controlling essential design activities.

(2) Design documents such as calculations, diagrams, specifications, and drawings are prepared and records developed such that the final design is traceable to its sources.

(3) Design activities, documents, and interfaces are controlled to assure that applicable input such as design bases, regulatory requirements, codes, and standards are incorporated into the final design.

(4) Design input requirements, including design criteria, are documented and their selection reviewed and approved.

(5) Design documents include an indication as to their importance to safety and shall specify the quality characteristics, including materials, parts, equipment and processes, that are essential to functions of structures, systems, and components. Design documents also include, as appropriate, acceptance criteria for inspections and tests.

(6) Design control measures are applied to items such as seismic, stress, thermal, hydraulic, radiation, and accident analyses, as they apply to the development of design input or as they are used to analyze the design.

(7) Safety related and/or Seismic Category I designs are verified for adequacy and accuracy through independent objective review of design documents by individuals competent in the subject activity. This verification may include the use of alternate or simplified solution methods or qualification testing, as appropriate.

(8) Design changes, including engineering, vendor, and construction originated changes, are controlled in a manner commensurate with the control imposed on the original design.

(9) Document distribution is controlled such that all individuals using a design document or its results and/or conclusions for further design work can be notified if the document is revised or cancelled.

(10) Design documentation includes evidence that design control requirements have been satisfied.

HL&P has contracted with B&R and Westinghouse to perform the design, engineering and design verification. HL&P Engineering performs reviews of selected elements of the completed design, design documents and specifications to ensure that contractual requirements are met.

HL&P Houston Quality Assurance performs audits of HL&P, B&R and Westinghouse to ensure that design controls, requirements, specifications and documents are in accordance with the design control criteria.

In addition HL&P Project Quality Assurance reviews quality/construction procedures to ensure that the quality requirements of the design specifications are incorporated. HL&P Project Quality Assurance also performs implementation reviews to ensure that the work is accomplished in accordance with the design requirements and to ensure that field changes to the design are processed in accordance with the design control criteria.

4.0 Procurement Document Control

To assure that nuclear safety-related items are purchased in a planned and controlled manner, the HL&P Project Quality Assurance Plan establishes basic requirements which are to be used by HL&P in preparing procurement procedures for the South Texas Project. B&R performs procurement activities for nuclear safety-related equipment, materials and services, exclusive of the NSSS contract, which is performed by Westinghouse. B&R and Westinghouse ensure through contract, vendor surveillance and audit that their suppliers comply with the established requirements.

The basic requirements are:

a. Procurement procedures which ensure that the applicable regulatory, quality assurance, and engineering design requirements as well as the purchasers right of access to the suppliers facilities are included.

b. Provisions for review, change control, and approval of procurement documents and supplier documents such as instructions, procedures, drawings, specifications and records by the procuring organizations.

c. Procedures for the evaluation and selection of suppliers. The evaluation shall involve a technical review by the cognizant engineering group, a commercial review by Purchasing/Subcontracts and a quality assurance review.

d. Measures for the control of purchased material, non-conforming items, equipment and services, including supplier surveillance, source inspection and audits.

e. Control measures taken to assure that documented evidence of conformance of material and equipment to procurement requirements is available at the plant site prior to installation or use of such material or equipment.

HL&P Engineering is responsible for review and approval of B&R Procurement Specifications. Engineering also coordinates with HL&P Procurement QA for performance of a quality assurance review. HL&P Procurement QA coordinates with B&R and HL&P Engineering in the review of the procurement package.

In addition HL&P Discipline QA is responsible for reviewing field procurement packages to ensure that all quality assurance requirements have been included.

HL&P Houston Quality Assurance is responsible for performing audits and vendor surveillance to verify that the requirements have been implemented and that they are effective.

5.0 Instructions, Procedures and Drawings

The HL&P Project Quality Assurance Plan requires HL&P, the prime contractors and their suppliers to establish and implement a Quality Assurance Program which is in compliance with 10CFR50 Appendix B. The program is effective in verifying that the defined activities are accomplished and documented in accordance with written procedures, instructions, and drawings and that they provide quantitative and qualitative acceptance criteria.

HL&P Project Quality Assurance reviews and approves the B&R South Texas Project Quality Assurance Program and nuclear safety-related construction procedures. To measure the effectiveness of the B&R Quality Assurance Program, HL&P has implemented a monitoring program consisting of audits which are performed by HL&P Houston Quality Assurance and implementation reviews, trend analysis and inspection verifications performed by the HL&P Project Quality Assurance Department. HL&P Houston Quality Assurance also audits HL&P organizations and Westinghouse for compliance with their respective Quality Assurance Programs.

6.0 Document Control

The HL&P Project Quality Assurance Plan and implementing procedures require that HL&P, the prime contractors and subcontractors implement a document control system for nuclear safety-related items for the South Texas Project. The established system ensures that design, engineering, procurement, fabrication, construction, and QA/QC procedures, plans, and changes thereto are reviewed and approved by procedurally authorized groups and that the documents are issued, maintained current and controlled by the use of controlled lists of document holders to ensure that superseded documents are replaced in a timely manner.

HL&P discipline Quality Assurance performs implementation reviews at the construction site to ensure that document control systems are in place and effectively implemented. HL&P Quality Assurance audits are performed to ensure compliance with these criteria.

7.0 Control of Purchased Material, Equipment, and Services

The HL&P Quality Assurance Plan and implementing procedures require that HL&P, prime contractors and subcontractors define and document the system and requirements for the control of nuclear safety-related purchased material, equipment and services. The system shall consist of:

a. Engineering, Purchasing and Quality Assurance in their respective areas perform evaluations of the vendors quality system, performance data, effectiveness, design control ability, specifications, documentation, personnel qualifications and training prior to contract award.

b. Source inspection and auditing for the purpose of determining compliance to the QA Program and procurement documents by witnessing process controls, inspections and reviewing documentation.

c. Certifications which contain relevant data and documentation required to verify compliance to the purchase documents for final acceptance and approval.

d. Receiving inspection at the South Texas Project to ensure that final source surveillance was performed or duly waived, that examination of specific criteria related to the item's shipping condition was made, and that there is identification and documentation of the parameters to be verified, including the status of any nonconformances.

B&R receiving inspection ensures that, for nuclear safety-related items received at the South Texas Project, there is accompanying documentation that indicates review and concurrence by the prime contractor or designee, that the item complies with established requirements or has an authorized waiver prior to shipment. HL&P Quality Assurance audits are performed to ensure compliance with these criteria.

HL&P Procurement QA ensures by an overview of the B&R vendor surveillance function that source surveillance and inspection are performed in accordance with the quality assurance program. In addition HL&P Discipline QA performs implementation reviews of activities commencing with receiving inspection at the site to ensure proper controls of purchased material and equipment are exercised.

HL&P Houston QA performs audits of these activities to ensure overall compliance.

8.0 Identification and Control of Material, Parts and Components

The HL&P Project Quality Assurance Plan requires that prime contractors and suppliers establish written procedures which identify, control and ensure traceability of materials, parts and components including partially assembled components. Prime contractors and suppliers procedures shall include the documented verification of correct identification of materials, components and subassemblies, and that the identification does not affect the function or quality of the item prior to release of the items for assembly or installation.

HL&P Project QA ensures that the above criteria are incorporated into the B&R Quality/Construction procedures during the review/approval cycle and then follows up with implementation reviews to ensure compliance.

HL&P Quality Control performs selected inspections to verify proper identification and control during construction activities.

In addition HL&P Houston QA performs audits for evaluation of the conformance to identification and control criteria.

9.0 Control of Special Processes

The HL&P Project Quality Assurance Plan requires that written procedures be established by prime contractors and subcontractors for the activities associated with all special processes. For special processes the qualification of personnel, procedures and equipment relating to specific codes, standards, specifications and contractual requirements shall be documented and maintained current.

HL&P Discipline QA ensures that the special process control criteria are met by review and approval of all B&R special process procedures and performance of implementation reviews to ensure compliance.

HL&P Quality Control will perform certain special process examinations (NDE) during the inspection verification process. These examinations will be performed by personnel qualified in accordance with ASNT-TC-1A-75 using qualified procedures approved by HL&P NDE Level III personnel.

HL&P Houston QA performs audits of special process activities to ensure compliance with all aspects of the Quality Assurance program.

10.0 Inspection

The HL&P Project Quality Assurance Plan requires B&R to establish and implement an inspection operation whose activities are independent from the group performing the activities being inspected. The training, qualifications and certifications of inspectors includes criteria from appropriate codes, standards and B&R procedures and shall be documented and kept current. Inspection activities relating to construction, fabrication, installation and testing are documented, kept current and identify all mandatory inspection hold and test points and the criteria to be witnessed by authorized inspectors. Operations and inspections (including rework, replaced items) are performed in predetermined, documented sequences and deviations or deletions must be accomplished in accordance with approved and documented systems. Inspection procedures include all required inspection operations defined by the specifications, drawings, codes and standards.

Where direct inspections are impossible or disadvantageous, in-process monitoring is specified in the inspection procedures and both direct and in-process monitoring are used when control is inadequate without both. All required procedures, specifications and drawings are made available to the inspectors prior to performing inspection.

HL&P Discipline QA ensures that inspection control criteria are complied with by review and approval of the inspection procedures and by implementation reviews of inspections in each discipline activity.

In addition to the Discipline QA controls, HL&P has instituted an inspection verification program to evaluate the effectiveness of the B&R inspection activity. The HL&P inspections are performed by the HL&P Quality Control group. HL&P Discipline QA will determine specific activities and areas to be inspected by HL&P QC.

The HL&P Inspectors are trained and certified by a program conforming to ANSI N45.2.6 and as applicable, ASNT-TC-1A-75.

HL&P QC personnel will also be directed by Discipline QA to perform followup inspections on selected non-conformance report and corrective action requests to ensure proper close-out verifications by B&R.

HL&P Houston QA performs audits of HL&P and B&R inspection activities to ensure compliance with these criteria.

11.0 Test Control

The HL&P Project Quality Assurance Plan requires that a test control program be developed and documented by the prime contractors and subcontractors which demonstrates that the facility performs in accordance with the South Texas Project requirements and specifications. The training, certification of personnel, calibration and certification of test equipment, system or component status, environmental conditions, inspection hold points and configuration of the items to be tested are included in the procedures. Test results are documented, evaluated and the acceptance status determined by the authorized departments.

HL&P Discipline QA ensures inclusion of adequate test control criteria by review/approval of B&R Quality/Construction testing procedures. They also perform follow-up implementation reviews to verify that the controls are implemented and effective.

In addition, HL&P Discipline QA institutes hold points in the B&R test program to ensure witnessing by HL&P Quality Control personnel.

HL&P Houston QA then audits both HL&P and B&R activities to verify QA program compliance.

The test control activities are an example of a case in which HL&P Discipline QA monitoring activities and the Operational QA monitoring activities will interface and in some instances overlap. HL&P Project QA procedures will specifically define the responsibilities for this transition period.

12.0 Control of Measuring and Test Equipment

The HL&P Project Quality Assurance Plan requires the establishment, documentation and implementation of a Measuring and Test Equipment Control System. The system is to include calibration techniques, specifications and accuracy, frequency and maintenance of all measuring instruments and test equipment used in the measuring, inspection and monitoring of nuclear safety-related items. Calibration and maintenance data shall be filed and kept current. Calibration standards are to be traceable to nationally recognized standards. If standards do not exist, the basis for calibration of the equipment is to be documented. If measuring or test equipment is found to be out of calibration, an investigation is required to be performed to determine the validity of the use of the instrument and whether measurements or tests are required to be reperformed.

HL&P Discipline QA reviews and approves B&R calibration procedures to ensure these criteria are incorporated. In addition implementation reviews are performed to ensure compliance.

In the conduct of its inspection verifications HL&P Quality Control is required to use measuring and test equipment of the appropriate accuracy level which is controlled by procedures meeting the requirements of this section.

HL&P Houston QA audits the measuring and test equipment controls to ensure compliance to the QA program in this area.

13.0 Handling, Storage and Shipping

The HL&P Project Quality Assurance Plan requires that for nuclear safety-related items, written procedures be developed in accordance with design requirements, specifications and standards to control the cleaning, handling, storage, packaging, shipping and preservation to preclude damage and deterioation by environmental conditions. The activities are to be accomplished by appropriately trained and experienced personnel.

HL&P Discipline QA reviews and approves construction procedures for receiving, handling, storage and cleaning to ensure that the appropriate criteria of Regulatory Guide 1.38 and ANSI N45.2.2 are included. Periodic implementation reviews are conducted to ensure compliance to the procedures.

HL&P QC performs periodic inspection verifications to assure adequate inspection controls and HL&P Houston QA performs audits to ensure overall program compliance.

14.0 Inspection, Test and Operating Status

The HL&P Project Quality Assurance Plan requires that the prime contractor and subcontractors indicate the current inspection, test and operating status of nuclear safety-related items through the use of stamps, markings, tags or other suitable means. Procedures shall define and document the use, application, removal and status of inspection tags, labels and markings which identify the status of inspections or tests performed or attest to the acceptability of the structure, system, or component. HL&P Discipline Quality Assurance personnel review these procedures and conduct periodic verification to assure compliance. Houston Quality Assurance audits both HL&P Project QA and B&R to verify compliance.

15.0 Nonconforming Materials, Parts or Components

The HL&P Project Quality Assurance Plan requires that the prime contractors Quality Assurance Program include a system which is documented by written procedures for the identification, segregation and disposition of nonconforming materials, parts and components. The procedures shall specify the preparation and handling of nonconformance documents, segregation requirements and which groups are responsible for review and disposition of the items. Rework, repairs and subsequent reinspection shall be performed in accordance with controlled procedures and contain mechanisms for providing information to the identifying group as to the disposition of the nonconformance. For NSSS items, HL&P coordinates nonconformance resolution through Westinghouse. HL&P Project Quality Assurance reviews for concurrence the proposed disposition of selected Brown & Root nonconformance reports and performs an evaluation of Brown & Root nonconformance trend analyses. Compliance of these activities with Project Quality Assurance Plan Requirements is ensured through the performance of audits, implementation reviews, and inspection verifications.

16.0 Corrective Action

The HL&P Project Quality Assurance Plan for the South Texas Project requires that a system be established and documented by prime contractors which defines the responsibilities, authorities and methods used by specific groups involved in the evaluation of nonconformances and trending to determine the need for corrective action. The system includes measures to identify the cause of significant conditions adverse to quality, measures to ensure that the root causes are corrected, and measures to ensure that timely action is taken. Follow-up is performed to ensure the effectiveness of corrective action and that appropriate levels of management are informed of the results. HL&P Project Quality Assurance performs a review for concurrence of selected Brown & Root nonconformance reports and corrective action reports. HL&P Project Quality Assurance also performs trend analyses to determine the need for corrective action. Compliance of these actions with Project Quality Assurance Plan Requirements is verified by HL&P Quality Assurance through the performance of audits and implementation reviews.

17.0 Quality Assurance Records

The HL&P Project Quality Assurance Program requires that a Quality Assurance record system be developed by HL&P and the prime contractors for the South Texas Project. The record system provides evidence that activities relating to quality are defined, implemented and that inspection and test documents contain a description of the type of observation, reference to nonconformance reports, evidence relating to status of observation, date and inspector identification.

Quality records shall include reviews, audits, reports, specifications, nonconformance reports, implementation review checklists, analysis, personnel and equipment qualification procedures and associated documentation.

The Project Quality Assurance Plan requires that HL&P and prime contractors establish requirements to ensure that records generated during the design, procurement, construction, preoperational and start-up testing are identifiable, retrievable and meet the requirements of 10CFR50 and ANSI N45.2.9 as amended by Regulatory Guide 1.88, Revision 0. Compliance with Project Quality Assurance Plan Requirements is verified by HL&P Quality Assurance through the performance of audits and implementation reviews.

18.0 Audits

The HL&P Project Quality Assurance Plan establishes the requirement that HL&P, prime contractors and subcontractors develop, document and implement audit activities which are structured in accordance with the requirements of ANSI N45.2.12 for the South Texas Project. As required by the ANSI standard, results of audits are presented for review to management of the audited organization and the HL&P Executive Vice-President. Where indicated HL&P performs followup action, including re-audit of the deficient areas.

HL&P has the ultimate responsibility for the auditing of the quality related activities on the project. This responsibility is fulfilled by Houston Quality Assurance, which audits the activities of HL&P, its prime contractors and their suppliers and subcontractors.

The prime contractors and subcontractors perform quality related audits of internal activities and suppliers of material, components and systems.

HL&P and B&R perform supplemental audits when required, based on such factors as significant changes in the Quality Assurance Program, results of trending programs or investigations into the root causes of problems.

The HL&P Project Quality Assurance Plan requires that each year an independent outside firm shall conduct an overall audit of the South Texas Project Quality Assurance activities. The audit results are presented to the HL&P Executive Vice-President and the Manager, South Texas Project Quality Assurance. The audit results will be used by HL&P management to evaluate the effectiveness of the Quality Assurance program and to determine the need for changes in the Quality Assurance programs of HL&P and its contractors.

Table 1

Plan/Procedures used to Implement Quality Assurance for the Major Activities

1.0 Project Quality Assurance Plan	10CFR50 App. B Criterion
1. Introduction	II
2. Organization	I
3. Project Administration	I,V,VI,XV
4. Project Engineering	III
5. Procurement	IV,VII
6. Fabrication and Construction	IV thru XVII
7. Records	IV,VI,XVII
8. Auditing	VI,XVIII

Table 1

Plan/Procedures used to Implement Quality Assurance for the Major Activities

	2.0 Project Site Quality Procedures (PSQP)	10CFR50 App. B Criterion
PSQP-A1	Organization & Responsibility of Project QA/QC Personnel	I,II
A2	Project Site Quality Procedures	V,VI
A3	Handling of NRC Inspection Reports	XV,XVI
A4	Control of Site Documentation	VI
A5	Non-Nuclear Site Quality Assurance	N/A
A6	Document Reviews	V,VI
A7	Stop Work	XV,XVI
A8	Trend Analysis Administration	XVI
A9	Implementation Review	II,IV thru XVII
A10	Quality Control Administration	IX,X
A11	Training & Certification of Quality Control Personnel	II,IX,X
A12	Audit Overview	XVIII
A13	Vendor Surveillance Overview	IV,VII
A14	Construction QA - Operations QA Interface	II,XI,XVII

Table 1

Plan/Procedures used to Implement Quality Assurance for the Major Activities

3.0 HL&P Houston Quality Assurance Procedures		10CFR50 App. B Criterion
QAP - 3	. Procedure for Vendor Quality Surveillance	VII
3A	. HL&P Vendor Surveillance	VII
3B	. Second Party Vendor Surveillance	VII
5	. Audit Procedure	XVIII
5A	. Training and Qualification of Audit Personnel	II,XVIII
5B	. Performing the Audit	XVIII
5C	. Audit Filing	XVIII
11	. Review of NSSS QA Records Packages	VII

Table 1

Plan/Procedures used to Implement Quality Assurance for the Major Activities

4.0 Project Engineering Procedures		10CFR50 App. B Criterion
PEP - I	Introduction	
II	Manual Provisions	
III	Scope	
IV	Definitions	
-01	Preparation and Control of Project Engineering Procedures	VI
-02	Document Receipt & Handling	N/A
-03	Engineering Signature Authority	III
-04	Reference Document Library	N/A
-05	Performance of Owner's Reviews	III
-06	Design Change Request	N/A
-07	(deleted) Design Document Distribution List	N/A
-08	Engineering Action Item Tracking	N/A
-09	Transmittal of Owner's Review Comments to Ext. Organizations	N/A
-10	Project Engineering Organization & Responsibilities	I
-11	Reporting Design and Construction Deficiencies to NRC	XV,XVI
-12	Handling FSAR Change Notices	II
-13	Review of NRC Inspection and Enforcement Bulletins Circulars	II
-14	Designation & Handling of Confidential Security Documents	N/A
-15	Preparation of Purchase Authorizations (IP)	N/A
-16	Engineering Activity for the Procurement of Spare Parts	IV,VII

Table 1

Plan/Procedures used to Implement Quality Assurance for the Major Activities

4.0 Project Engineering Procedures		10CFR50 App. B Criterion
-17	Preparation of NSSS Contract Modification Approval (IP)	N/A
-18	Preparation and Control of Specifications	III,IV
-19	Processing Supplier Deviation Requests (IP)	III,IV
-20	Document Change Notice control (IP)	VI,III
-21	Design Verification (IP)	III
-22	Personnel Training (IP)	II

Note: (IP) indicates procedure is in preparation and not yet issued for use.

Table 1

Plan/Procedures used to Implement Quality Assurance for the Major Activities

		10CFR50 App. B Criterion
5.0	Project Site Administrative Procedures	
PSAP-01	Preparation and Control of Project Procedures	V
-02	Project Directives	N/A
-03	Telephone Minutes	N/A
-04	Project Correspondence	N/A
-05	Mail Processing	N/A
-06	Project Meetings	N/A
-07	Project Trip Approval	N/A
-08	Project Files	N/A
-09	Storage and Retirement of Project Records	XVII
-10	Monthly Manhour Reporting	N/A
6.0	Project Contract Administration Procedures	
PCAP-50	Work Authorization	N/A
-51	PBA Review	N/A
-52	Contract changes	N/A

Table 1

Plan/Procedures used to Implement Quality Assurance for the Major Activities

7.0	Project Site Procedures	10CFR50 App. B Criterion
PSP -01	Preparation and Control of Project Site Procedures	V
-02	Project Site Organization	I
-03	Construction Functions and Responsibilities	I
-04	Startup Functions and Responsibilities	I
-05	Field Change Requests	III
-06	Nonconformance Reports	XV
-07	Construction Review of Documents	VI
-08	Control of Construction	VI
-09	Processing Site Correspondence	N/A
-10	Site Procurement	IV
-11	Construction Interfacing for Testing & Turnover	II,X
-12	Transfer of Material Offsite	IV,VII
-13	Indoctrination & Training	II
-14	Equipment Inventory & Maintenance	VIII,XIII
-20	Issuance of Photo Identification Badges	N/A
-21	Camera Authorization	N/A
-22	Visitor Pre-Clearance	N/A
-23	Vendor Control	N/A

Table 1

Plan/Procedures used to Implement Quality Assurance for the Major Activities

		10CFR50 App. B Criterion
8.0	Records Management Systems Procedures	
1-2	Records Management Responsibilities & Interfaces	I
1-3	Preparation and Periodic Review of RMS Procedures	V
1-4	Records Management Personnel Training	II
2-1	Records Center Micrographic Section	XVII
T1-1	Flow of Nuclear Correspondence Within RMS Center	XVII
T2-1	Document Logging	VI
T2-2	Log Maintenance	VI
T2-3	Document Distribution	VI
T2-4	Storage & Maintenance of Nuclear Records	XVII
T2-5	Document Checkout	XVII
T2-6	Correspondence Serial Number Assignment	VI
T2-7	Correspondence Serial Number Corrections	VI
T2-8	Subject File Number Assignment	XVII
T2-10	NSSS Data Package Handling	XVII

TABLE 2

ANSI STANDARD AND REGULATORY GUIDE COMPLIANCE

The STP Quality Assurance Program complies with the following ANSI Standards and associated Regulatory Guides except as noted:

STANDARD	TITLE
ANSI N.45.2-1971 R.G.1.28 (Rev. 0,6/72)	Quality Assurance Program Requirements for Nuclear Facilities
ANSI N.45.2.1-1973 R.G.1.37(Rev. 0,3/73)	Cleaning of Fluid Systems and Associated Components During Construction Phase of Nuclear Power Plants
ANSI N.45.2.2-1972 R.G.1.38 (Rev. 0,3/73)	Package, Shipping, Receiving, Storage and Handling of Items for Nuclear Power Plants
ANSI N.45.2.3-1973 R.G.1.39(Rev. 0,3/73)	Housekeeping During the Construction Phase of Nuclear Power Plants
ANSI N.45.2.4-1972 R.G.1.30(Rev. 0,8/72)	Installation, Inspection and Testing Requirements for Instrumentation and Electric Equipment During the Construction of Nuclear Power Generating Stations
ANSI N.45.2.5-1974 (See Notes 1 & 2)	Supplementary Quality Assurance Requirements for Installation, Inspection and Testing of Structural Concrete and Structural Steel During the Construction Phase of Nuclear Power Plants
ANSI N.45.2.6-1973 R.G. 1.58 (Rev.0,8/73)	Qualifications of Inspection, Examination and Testing Personnel for the Construction Phase of Nuclear Power Plants
ANSI N.45.2.8 (Draft 3, Rev. 3,4/74)	Supplementary Quality Assurance Requirements for Installation, Inspection and Testing of Mechanical Equipment and Systems for the Construction Phase of Nuclear Power Plants
ANSI N.45.2.9-1974 R.G. 1.88 (Rev.0.8.74)	Requirements for Collection, Storage and Maintenance of Quality Assurance Records for Nuclear Power Plants
ANSI N.45.2.10-1973 R.G. 1.74 (Rev. 0,2/74)	Quality Assurance Terms and Definitions

TABLE 2

ANSI STANDARD AND REGULATORY GUIDE COMPLIANCE
(Continued)

STANDARD	TITLE
ANSI N.45.2.11-1974 R.G. 1.64(Rev.2,6/76)	Quality Assurance Requirements for the Design of Nuclear Power Plants
ANSI N.45.2.12 (Draft 3, Rev.4, 2/74) (see Note 3)	Requirements for Auditing of Quality Assurance Programs for Nuclear Power Plants
ANSI N.45.2.13 (Draft 2, Rev.4, 4/74)	Quality Assurance Requirements for Control of Procurement of Items and Services for Nuclear Power Plants
ANSI N.101.4-1972 R.G. 1.54(Rev.0,6/73)	Quality Assurance Requirements for Coatings Applied to Water Cooled Nuclear Power Plant

Exception Notes

1. ANSI N.45.2.5-1974, Section 4.8, states "Pumped concrete must be sampled from the pump line discharge". In lieu of this statement, in-process strength samples of pumped concrete are taken at the delivery point. Correlation tests of air content, slump, and temperature are performed to verify these plastic properties of the concrete at the placement point in accordance with the following frequency requirements:

   A. A minimum of 2 correlation tests are performed for each pumped placement exceeding 200 cu. yds.

   B. Otherwise, a minimum of 2 correlation tests per week are performed when any individual pumped placement during a week requires delivery of more than one truckload of concrete.

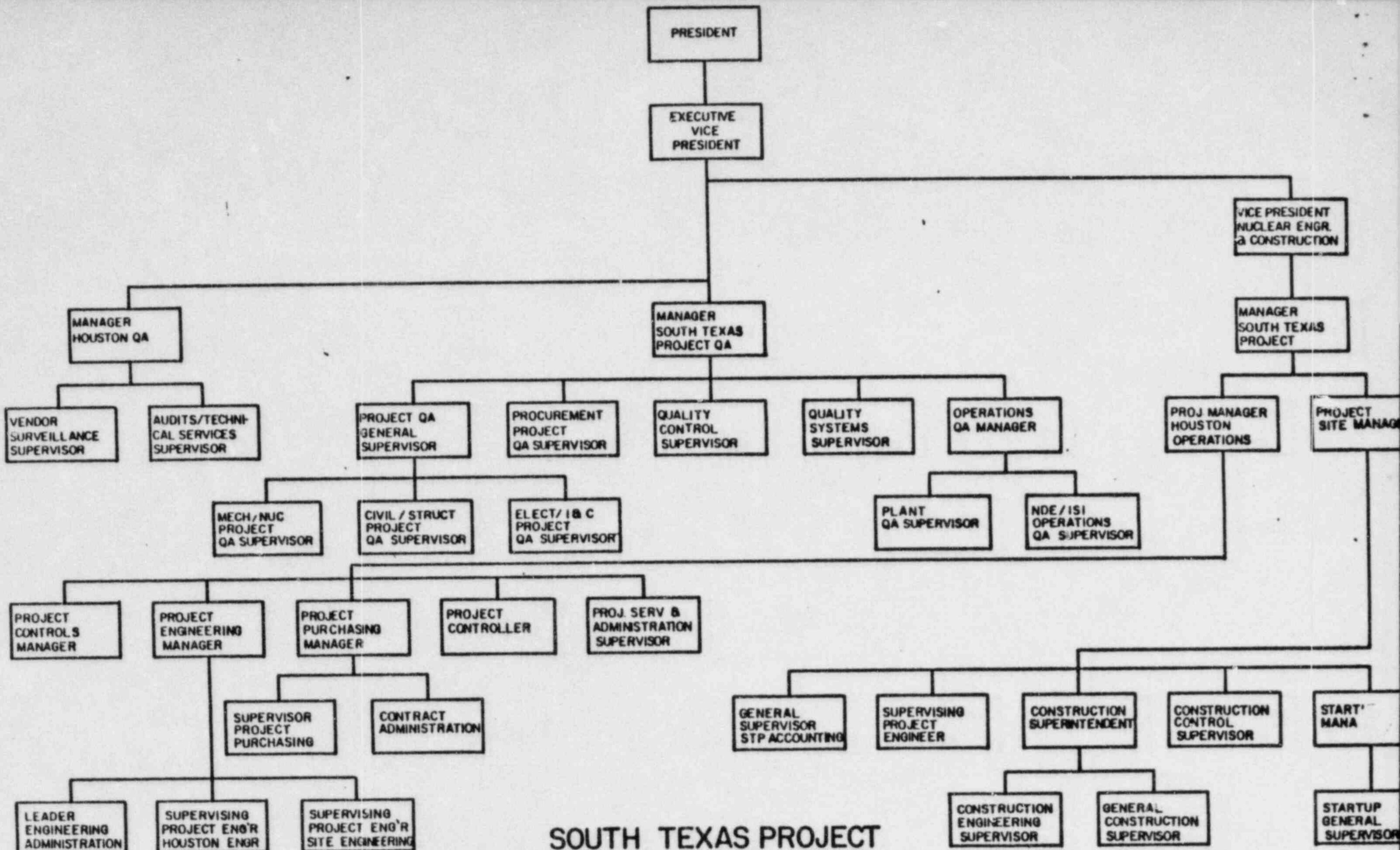
   C. During a week when a pumped placement exceeding 200 cu. yds. is made, the correlation tests performed on that placement will satisfy the weekly requirement for performing two correlation tests as specified in Item B above.

   When any of the specified limits and tolerances on loss of air content, slump, or temperature are exceeded at the placement point, correlation tests between the delivery point and placement point will be accomplished for each 100 cu. yds. of concrete placed as long as limits and tolerances are exceeded. If two consecutive tests are out of tolerence, corrective action will be implemented to assure that subsequent loads awaiting discharge into the pump are within tolerances for the placement. This will be accomplished by adjusting the plastic property requirements of the concrete at the pump intake.

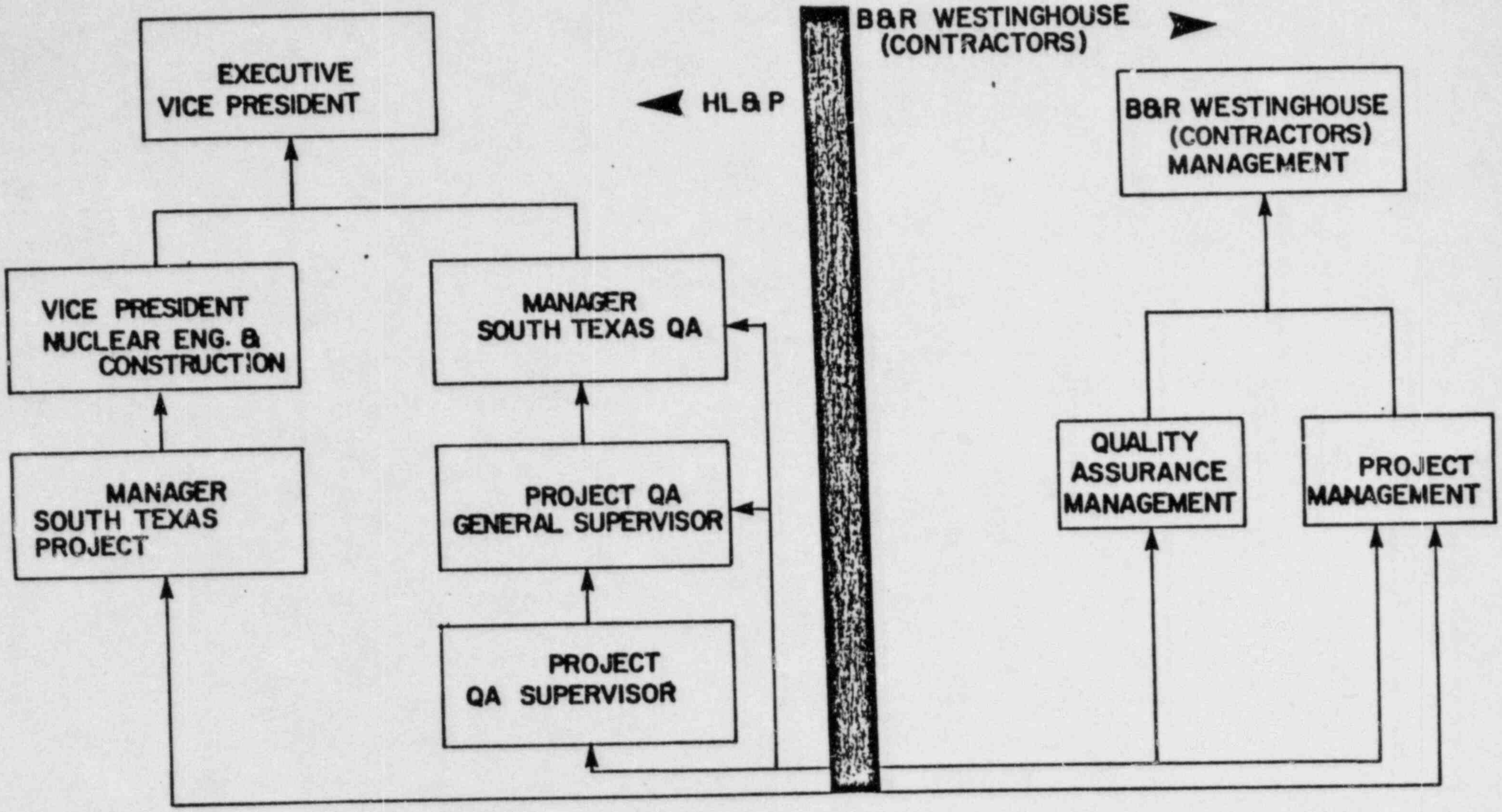
"Correlation Tests", "Delivery Point", and "Placement Point" are as defined in ANSI N.45.2.5-1978, Section 1.4.

2. Samples and frequency for cadweld testing is in accordance with ACI-359/ASME Section III, Division 2, issued for trial use and comment in 1973, including addenda 1 through 6, (see Sections 3.8.1.6.3 and 3.8.3.6.3 of the STP Final Safety Analysis Report).

3. If a work activity and contract is for a two-month period or less, an audit is not necessary when a facility preaward audit has been conducted.



SOUTH TEXAS PROJECT
INTERNAL QA RELATIONSHIP
Figure 1



LINES OF COMMUNICATION
HL&P & B&R/WESTINGHOUSE
(CONTRACTORS)
Figure 2

ATTACHMENT 1
PART B

BROWN & ROOT, INC.
QUALITY ASSURANCE PROGRAM DESCRIPTION
DURING DESIGN AND CONSTRUCTION

SOUTH TEXAS PROJECT ELECTRIC GENERATING STATION

OCTOBER 31, 1980

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TABLE OF CONTENTS

TABLE OF CONTENTS
(Continued)

TABLE OF CONTENTS
(Continued)

TABLE OF CONTENTS
(Continued)

LIST OF TABLES

LIST OF FIGURES

BROWN & ROOT, INC.
QUALITY ASSURANCE PROGRAM
DURING DESIGN AND CONSTRUCTION

SOUTH TEXAS PROJECT ELECTRIC GENERATING STATION

Brown & Root, Inc. (B&R) as the Engineer and Constructor of the South Texas Project Electric Generating Station Units 1 and 2 (STPEGS) has been delegated by Houston Lighting & Power Company (HL&P) the assignment of establishing and implementing a Quality Assurance Program for control of the B&R quality-related activities. Brown & Root has developed and implemented an overall Quality Assurance Program, as described herein, for controlling and documenting their quality-related activities during design, procurement and construction phases of the plant. These activities include, but are not necessarily limited to, design, procurement, handling, storage, fabrication, installation, erection, inspection, cleaning and testing operations. This program is for those systems which have an effect on nuclear safety in order to assure vital material, equipment, and components conform with the requirements of all applicable codes, standards, specifications, and procedures. This program meets the requirements of the "Quality Assurance Criteria for Nuclear Power Plants" contained in Appendix B to Title 10, Code of Federal Regulations, Part 50, Licensing of Production and Utilization Facilities.

1.0 ORGANIZATION

1.1 QUALITY ASSURANCE PROGRAM RESPONSIBILITY

The President of Brown & Root, Inc. has assigned to the Group Vice President - Power Group the operating responsibility for fulfilling Brown & Root's contractual obligation for design and construction of the South Texas Project (STP). The Power Group reports to the President through the Senior Executive Vice President - Operations. The Brown & Root corporate organization is shown on Figure 1.

The President of Brown & Root, Inc. has delegated, through the Group Vice President - Power Group to the Quality Assurance Manager - Power Group, the authority and responsibility for establishing and enforcing the Brown & Root Quality Assurance Program. This authority and responsibility is delegated and documented in the form of the following policy statement issued by the President:

> "Brown and Root is dedicated to furnishing high quality, reliable plants and services. All work shall comply with ASME Codes, legal requirements, and industry standards as defined in our contracts.
>
> "At my instruction, this Quality Assurance Program has been established to assist in achieving these objectives. The authority for administration of this Program within the Power Group is hereby assigned to the Quality Assurance Manager who reports to the Power Group - Group Vice President.
>
> "It is the Quality Assurance Manager's responsibility to provide program leadership, to assure compliance with Program requirements, to coordinate resolution of problems, and to assure proper implementation of improvements. Questions regarding this policy should be directed to the Power Group - Group Vice President for resolution, and if major difficulties cannot be resolved in this way, they will be referred to my office for a final decision.
>
> "To be fully effective, this Program must be understood, accepted, and fully implemented by each employee holding responsibility within the Program. Therefore, all supervisors shall coordinate their operations to assure complete compliance.

"Changes to this Quality Assurance Program will be issued periodically in order to reflect current industry Codes and Standards. Suggested improvements should be submitted to the Quality Assurance Manager for evaluation and program change."

To implement this policy, the QA Manager - Power Group has established a QA Department, including a South Texas Project QA Organization, to administer the QA Program during the design, procurement, and construction activities of the Project.

1.2 POWER GROUP ORGANIZATION

The Group Vice President - Power Group is delegated the overall responsibility within the B&R organization for the design and construction of nuclear power plants. As shown on Figure 2, the Power Group includes the following departments: Power Operations, Power Construction, Power Engineering, and Quality Assurance. The management of each department reports directly and independently to the Group Vice President - Power Group. Figure 2 depicts the separation and independence of the QA Department from other departments within the Power Group.

1.2.1 Power Operations Department

The Power Operations Department (as shown on Figure 2) provides Management Services and Project Management activities for Power Group projects. The Management Services activities include administering the functions associated with estimating, cost control, schedule, project reporting, and materials management. Project Management provides the management of projects for which B&R has contractual responsibility for engineering, procurement, and construction. Project Management functions include the administration and coordination of project cost, schedules, scope, and client contact.

For the South Texas Project, whose B&R project scope includes engineering, procurement, construction and quality assurance activities, a Vice President/Project General Manager is assigned overall B&R management responsibility for these activities except the quality assurance activities. This position reports directly to the Senior Vice President - Power Operations.

1.2.2 Power Construction Department

The Power Construction Department (as shown on Figure 2) provides for the management and administration of all construction activities. Such activities include, but are not necessarily limited to, field engineering, erection, installation, maintenance and storage of equipment, and management of subcontractors.

1.2.3 Power Engineering Department

The Power Engineering Department (as shown on Figure 3) provides power plant design, design-related activities, design analysis, field service, licensing, and technology development. The department responsibilities are implemented through engineering standards and procedures necessary to control and document design activities.

1.2.4 Quality Assurance Department

Under the direction of the QA Manager - Power Group, the QA Department is responsible for the implementation of the QA Program in accordance with B&R Corporate Policy; Nuclear Regulatory Commission (NRC) Regulation, 10CFR50, Appendix B; the Client's contractual Quality Assurance Plan; and the Quality Assurance Program identified to the NRC. The QA Department (as shown on Figure 4) prepares, coordinates, and issues the Power Group QA program and procedures. Additionally, the QA Department assures compliance to procedures through periodic audits/surveillance of the B&R quality-related activities.

The QA Manager - Power Group has the following primary functions and authority:

1. Preparing, reviewing, approving, and implementation of Power Group QA procedures necessary to enforce the QA Program.

2. Review of design, procurement, and construction activities to verify and enforce compliance to the QA Program.

3. Implementing QA activities related to procurement, such as procurement document review, source surveillance inspections, and audits.

4. Implementing site QA functions related to construction activities.

5. Implementing stop work authority when necessary to enforce quality requirements.

6. Preparing and issuing periodic reports to B&R Management and HL&P on the status and effectiveness of the QA Program.

7. Conducting quality audits of Vendors, Engineering, Procurement, Construction, and Project Quality Assurance activities. These audits are conducted independent of project control through the QA Audit Manager.

The minimum qualification requirements for the position of QA Manager-Power Group is that the appointed individual, at time of assignment to the position, must have six years experience in the field of quality assurance, preferably supervisory experience with design and construction activities of a nuclear power plant. At least one year of this six years experience must be nuclear power plant experience in the overall implementation of a quality assurance program. A minimum of one year of this six years experience must be related technical or academic training. A maximum of four years of this six years experience can be fulfilled by related technical or academic training.

1.3 SOUTH TEXAS PROJECT ORGANIZATION

1.3.1 Project General Management

The Project General Management (see Figure 5) for the South Texas Project directs the overall B&R project activities, except those areas of responsibility of the Project QA Department. The Vice President/Project General Manager and his staff are singularly responsible within the B&R organization for overall project planning, coordination of the efforts of Engineering, Material Management and Construction, identification and resolution of problems, monitoring job progress and cost performance, and contact with HL&P.

1.3.2 Project Site Organization

The Vice President/Project General Manager is represented, on site, by the STP Deputy General Manager/Site Manager, who directs the overall B&R project site activities, except these areas of responsibility of the Project QA Department. The project site organization is shown on Figure 6. The Assistant Engineering Manager - Site Design Engineering receives technical direction from the Engineering Project Manager, and project direction regarding administration, controls, and policy from the Deputy General Manager/Site Manager.

1.3.3 <u>Project Engineering Organization</u>

The STP Engineering Project Manager provides technical direction and coordination of the design. The Engineering Project Manager reports to the Senior Vice President/Chief Engineer - Power Engineering who provides technical direction and guidance. In addition, the Engineering Project Manager reports to the Vice President/Project General Manager for project direction regarding administration, controls, and policy. The Project Engineering organization is shown on Figure 7.

Design Quality Engineers within the Engineering organization recommend engineering quality policy, ensure that adequate procedures are developed, and review conformance to these procedures by Engineering personnel.

1.3.4 <u>Project Materials Management Organization</u>

The STP Materials Management organization, interfacing with B&R Departments and HL&P's Purchasing, performs purchasing, subcontracting, expediting, material control and warehousing activities. The coordination and establishment of project procedures for these activities are the responsibilities of the Materials Manager. The Materials Manager reports to the Vice President/Project General Manager. The Materials Management organization is shown on Figure 8.

1.3.5 <u>Project Quality Assurance Organization</u>

The STP Quality Assurance organization is supervised by the Project QA Manager (PQAM) who has been delegated sufficient authority to assure proper implementation of the QA Program, proper training of QA personnel, and proper documented evidence of the overall QA Program. The Project QA Manager reports directly to the QA Manager - Power Group on QA matters and personnel administration matters. The Project QA Manager coordinates with the Vice President/Project General Manager regarding project administrative matters. The Project QA Manager receives programmatic direction and communications from the HL&P STP QA Manager. Reporting to the Project QA Manager are the following department managers:

1. Quality Engineering

2. Quality Control

3. Quality Systems

4. Vendor Surveillance/Houston Coordination

5. Site Surveillance

The Quality Engineering function encompasses the major disciplines (i.e., Mechanical, NDE, Electrical, Instruments & Controls, Civil, Structural, and certain specialized functions such as coatings and insulation). Quality Engineers control quality assurance activities related to their individual disciplines. The Quality Engineers work closely with the lead discipline counterparts in Engineering and Construction to resolve in a timely fashion, problems that are identified during construction to assure that the cause is determined and adequate corrective action is accomplished. The Quality Engineers perform reviews of engineering documents, purchase orders, and nonconformance reports for assuring conformance to quality requirements, and prepare quality control inspection plans. The Quality Engineers participate in planning QA activities (procedures, plans, training, etc.) associated with specific construction activities. Finally, the Quality Engineers assure that the QC inspectors are provided clear instructions and acceptance criteria.

Quality Control inspects construction activities pursuant to inspection planning instructions prepared by Quality Engineering. Quality Systems coordinates the maintenance of QA records, records turnover procedures, the QA training and certification program, and nonconformance trend analysis program. Vendor Surveillance/Houston Coordination assures that inspections and audits of vendor activities are performed, and serves as the interface between QA and Houston Engineering and Procurement activities. Site Surveillance performs surveillance over site activities at the direction of the Project QA Manager and verifies the adequacy of the corrective actions taken in response to this surveillance. The STP Quality Assurance organization is shown on Figure 9. A more detailed listing of the functions of each Quality Assurance organizational component is provided on Table 1.

The Project QA Manager has the following primary functions and authority:

1. Maintains an organization chart and job descriptions which define QA personnel duties and responsibilities.

2. Prepares, approves, issues, and ensures the implementation of Project Procedures developed to control the activities of the QA organization.

3. Provides for indoctrination and training of QA personnel.

4. Interfaces with the QA Manager - Power Group and other B&R organizations on quality related Project matters.

5. Ensures receipt inspection of items; ensures that identification and control of items are maintained until turnover; ensures special processes are controlled and accomplished by certified personnel and procedures; and ensures the calibration of measuring and test equipment.

6. Reviews and approves nonconformance reports and corrective action requests.

7. Maintains QA records in accordance with applicable procedures.

8. Implements stop work authority when necessary to enforce project quality requirements.

9. Reviews the status of the QA activities with the QA Manager - Power Group and the HL&P STP QA Manager.

10. Trends nonconformances and submits reports to HL&P, the QA Manager - Power Group, and other affected department management.

11. Submits project quality documents to the QA Manager - Power Group for review by the Quality Assurance Management Review Board (QAMRB).

The minimum qualification requirements for the position of Project QA Manager is that the appointed individual, at time of assignment to the position, must have six years experience in the field of Quality Assurance, preferably supervisory experience with design and construction activities of a nuclear power plant. At least one year of this six years experience must be nuclear power plant experience in the overall implementation of a quality assurance program. A minimum of one year of this six years experience must be related technical or academic training. A maximum of four years of this six years experience can be fulfilled by related technical or academic training.

1.4 QA AUTHORITY AND ORGANIZATIONAL FREEDOM

To assure the establishment and operation of the Quality Assurance Program, B&R personnel performing the QA functions have the freedom to identify quality problems and provide means for verifying solutions have been implemented. .The QA organizations have sufficient independence, authority and technical expertise to carry out the program in an efficient and effective manner. This is assured by the B&R QA Management reporting to management levels above and independent from the direct influences of the pressures of project production.

It is the responsibility of each part of the B&R organization to implement activities delegated to it through the QA Program. The policies and procedures established and implemented by the QA Department provide the authority and organizational freedom necessary for the assigned QA personnel to implement QA Program activities. Such activities include, but are not necessarily limited to, the identification of quality problems; the initiation, recommendation, or provision for solutions; the verification of implementation of solutions; and the control of further processing or installation of nonconforming items until an approved disposition of the deficient or unsatisfactory condition is effected. Such activities further include the review and approval of quality-related procedures, training and certification of QA personnel, and auditing of quality activities.

2.0 QUALITY ASSURANCE PROGRAM

2.1 BROWN & ROOT QUALITY ASSURANCE PROGRAM SCOPE

The Brown & Root STP QA Program complies with the requirements of ANSI N45.2 Standards and implementing Regulatory Guides identified on Table 2. The B&R STP QA Program applies to design, procurement, and construction activities affecting the quality of safety-related structures, systems, and components. These safety-related items are identified on Tables 3.2.A-1 and 3.2.B-1 of the STP Final Safety Analysis Report.

2.2 BROWN & ROOT QUALITY ASSURANCE PROGRAM DESCRIPTION

2.2.1 Quality Assurance Program Documentation

The written policies that implement the QA Program are contained in the QA Manual. The QA Manual is the key document for controlled implementation of the QA Program. The QA Manual establishes the responsibilities and requirements for implementation of the QA Program and identifies the requirements for the procedures and instructions necessary to control QA Program implementation. The issuance and revision of the QA Manual is controlled by Quality Assurance. Compliance to the requirements of the QA Manual is mandatory.

The mandatory requirements for implementation are communicated to the organization by means of the management statement of policy as part of the QA Manual and related project documents, and to other organizations through special clauses in procurement and contract documents.

Project procedures and program documents issued by the cognizant organizations describe the methods and controls for implementing the QA Program and QA Manual requirements. Tables 3 through 6 provide a listing of the current implementing project procedures and their relationship to the 18 criteria of 10CFR50, Appendix B.

The QA Program is approved by the Group Vice President - Power Group. The QA Manual is reviewed and approved by the QA Manager - Power Group. Project procedures and program documents are reviewed by and approved by the cognizant managers responsible for initiation of these documents.

2.2.2 Supplier and Subcontractor Quality Assurance Program Requirements

Section 4.0 of this program includes a description of the methods used to impose the applicable QA Program requirements on suppliers and subcontractors.

2.2.3 Personnel Indoctrination, Training, and Certification

The QA Manual describes the requirements for indoctrination, training, and certification of all Power Group personnel who perform quality-related activities. Each organization, as required, will develop procedures, and/or instructions that identify the material to be presented, methods of presentation, schedules for conducting sessions, and the individuals to be trained. The indoctrination, training, and certification program is such that:

1. Personnel performing quality-related activities are instructed as to the purpose, scope, and implementation of the quality-related procedures and instructions. This training occurs prior to implementation of a new or revised procedure or instruction.

2. Personnel performing quality-related activities are trained and qualified, as required, in the principles and techniques of the activity being performed.

3. The scope, the objective, and the method of implementing the indoctrination and training program are documented.

4. Proficiency of personnel performing quality-related activities is maintained by scheduled refresher training and reexamination, and/or recertification, where appropriate.

The Project QA Manager developes, implements, and maintains an indoctrination, training, and certification program for all QA personnel. This program meets the requirements of Regulatory Guide 1.58 as identified on Table 2.

2.2.4 Stop Work

The QA Program provides QA personnel with stop-work authority during the design and construction phases. This authority is delineated in written procedures and is applied to all work directly performed by B&R and/or Subcontractors.

2.2.5 Management Review

The Quality Assurance Management Review Board, established by and under the direction of the Group Vice President - Power Group, consists of selected upper management such as the Senior Vice Presidents of Power Group, Power Operations, Power Construction, Power Engineering, and the QA Manager - Power Group. On a regular basis, members of the QAMRB meet to review reports of audits, corrective actions, monthly activities, and performance trends, as well as special problems which cannot be resolved at lower management levels. At least once a year an audit of the QA Program is conducted by a special evaluation team independent of the project activities. The audit team is selected by and reports to the QAMRB and is charged with the task of auditing QA Program activities performed on the project to verify compliance with the QA Program requirements.

2.2.6 QA Program Revision

If programmatic change is required to those functions herein described, Brown & Root will provide prior to implementation a proposed amendment to this QA Program description to Houston Lighting & Power Company (HL&P) for its review and approval. Tables 3 through 6 of this program description provides a listing of those procedures currently in effect for control of the Quality Assurance, Engineering, Materials Management and Construction activities. New and revised procedures are prepared and approved in a manner commensurate with the schedule of quality-related activities on the Project. Revised procedure lists, Tables 3 through 6, will be submitted to HL&P semi-annually.

3.0 DESIGN CONTROL

The Engineering Procedures Manual implements the Quality Assurance Program as it applies to nuclear power plant design activities. Engineering Procedures, contained in the manual, provide for the systematic application of design control requirements such that the design is defined, controlled, and verified. Basic design control requirements for identification, preparation, review, document control, change control, and records are applied to the design of systems, structures, and components; and design control requirements are applied, on an item by item basis, as a function of importance to safety and design complexity.

Design control is the responsiblity of the Engineering Project Manager (EPM) who reports to the Vice President/Project General Manager for project direction and to the Senior Vice President-Power Engineering for technical direction. Design activities are controlled on a project basis. Design responsibilities are divided into specific discipline areas and the cognizant Discipline Project Engineer reports to the EPM for Project direction and to the EPM and his home Discipline Manager jointly for technical direction. The EPM is assisted by Assistant Engineering Project Managers (AEPM) who are individually responsible for system design, physical design, site engineering, and support activities.

3.1 DESIGN CONTROL REQUIREMENTS

The following design control requirements are implemented to ensure that all design activities are conducted in a manner that is conducive to a quality power plant design:

1. A design control system is established to document the methods of accomplishing and controlling essential design activities.

2. Design documents such as calculations, diagrams, specifications, and drawings are prepared and records developed such that the final design is traceable to its sources.

3. Design activities, documents, and interfaces are controlled to assure that applicable input such as design bases, regulatory requirements, codes, and standards are incorporated into the final design.

4. Design input requirements, including design criteria, are documented and their selection reviewed and approved.

5. Design documents include an indication as to their importance to safety and shall specify the quality characteristics, including materials, parts, equipment and processes, that are essential to functions of structures, systems, and components. Design documents also include, as appropriate, acceptance criteria for inspections and tests.

6. Design control measures are applied to items such as seismic, stress, thermal, hydraulic, radiation, and accident analyses, as they apply to the development of design input or as they are used to analyze the design.

7. Safety related and/or Seismic Category 1 designs are verified for adequacy and accuracy through independent objective review of design documents by individuals competent in the subject activity. This verification may include the use of alternate or simplified solution methods or qualification testing, as appropriate.

8. Design changes, including engineering, vendor, and construction originated changes, are controlled in a manner commensurate with the control imposed on the original design.

9. Document distribution is controlled such that all individuals using a design document or its results and/or conclusions for further design work can be notified if the document is revised or canceled.

10. Design documentation includes evidence that design control requirements have been satisfied.

3.2 DESIGN CONTROL ACTIVITIES

The following design control activities are conducted to ensure the engineering quality of all safety-related and/or Seismic Category I systems, structures, and components of a nuclear power plant.

3.2.1 Procedure Preparation

Engineering Procedures are prepared to establish a design control system. These procedures address appropriate design control requirements and document the methods of accomplishing and controlling essential design activities. Such Engineering procedures are submitted to Quality Assurance for review.

3.2.2 Standard, Guide, and Instruction Preparation

Technical standards, guides, and instructions are prepared by Project Engineering Disciplines to establish appropriate technical methods and requirements for design development. These documents may include, but are not limited to, methods and requirements pertaining to items such as stress, thermal, hydraulic, seismic, radiation, and accident analysis, material compatibility, and accessibility for inservice inspection, maintenance, and repair. Technical standards, guides, and instructions are considered to be design documents subject to all applicable design control requirements.

3.2.3 Design Development Control

Design development is controlled by preparing design documents, including calculations, diagrams, specifications, and drawings, according to a well defined design process. The design process provides for developing the design in progressing detail, from conceptual design to final procurement documents and production drawings that are used to procure and erect structures, systems, and components.

3.2.4 Design Input Control

Design input requirements are documented, and reviewed, to ensure that their effect on the final design is adequately considered. These requirements include, but are not limited to, design criteria, regulatory requirements, codes, standards, and requirements for testing, inspection, maintenance, handling, storage, and shipping. Assumptions are identified as "Preliminary" to provide for tracking, and verification prior to records turnover.

3.2.5 Design Verification

Nuclear power plant designs are verified for adequacy and accuracy through review of design documents by a technically qualified individual(s) other than the originator(s). Design verification may include techniques such as the use of alternate or simplified solution methods or qualification testing. The selection of verification technique and depth of review are based upon the complexity of the design, the importance of the design to safety, and the extent of any adverse conditions that influence design; but in any event design reviews ascertain that the design correctly and accurately represents design input and that the design method and assumptions are appropriate for the stated objective of the design. Safety related features of the power plant design are verified, in accordance with the above paragraph, through independent objective review of design documents by individuals or groups having no direct or immediate supervisory responsibility for developing the design under consideration. When the verification process is done by an individual review, such reviews will be conducted by persons whose primary assignment is the verification task. In particular, independent reviewers may not (1) be the preparer(s) of the design, (2) have immediate supervisory responsibility for the individual(s) performing the design, (3) have specified a singular design approach, (4) have ruled out certain design considerations, or (5) have established the design input for the particular design aspect being reviewed. Additionally, independent objective reviewers must be adjudged to be technically qualified by their Discipline Project Engineer, to have such qualification documented, and to provide documented evidence regarding the extent and results of their review. All such reviewers must receive specific training for this task and the results of their work is reviewed by Engineering Management. Design reviews are documented on specific forms to provide objective evidence of their extent and results; and where qualification testing is used as part of the review process, the tests are identified, documented, and performed in accordance with written procedures and instructions.

3.2.6 Design Document Control

The design of a structure, component, or system is conveyed by one or more of the following documents which are prepared, reviewed, approved, and distributed according to Project procedures:

1. System Design Descriptions
2. Technical Reference Documents
3. Purchase Specifications
4. Construction Specifications
5. ASME Design Specifications
6. Calculations
7. Drawings

3.2.6.1 System Design Descriptions

The basis for the design of each system is contained in a System Design Description (SDD). An SDD identifies the system's design criteria including design inputs and their sources; applicable Code, standard, and regulatory requirements; operation parameters and environmental conditions; structural loadings, mechanical loadings, and electrical requirements; and safety, quality assurance, material, fabrication, and construction requirements.

When the design of a system is initially developed, the basic design requirements are published in an SDD that is unique to the system. As the design is finalized, the design basis is reflected in calculations, Specifications, Technical Reference Documents, and drawings. The status of each of these documents is tracked by the cognizant Project Engineering Discipline in accordance with applicable Project Engineering Procedures, and as these design documents reach completion, the SDD is revised to reflect the as-designed configuration.

3.2.6.2 Technical Reference Documents

The design of a system, as conveyed by an SDD, may be supported by one or more Technical Reference Documents (TRD), which may cover more than one system. A TRD is not an SDD, but it may contain design criteria. In such cases, these design criteria will augment or supplement the design criteria contained in an SDD(s). Technical Reference Documents may include, but are not limited to, the following: design criteria (other than those contained in SDDs); standard attachments to Purchase Specifications; reports including Design Reports, Stress Reports, test reports, etc.; lists (e.g., valve lists, line lists, etc.); B&R Standards; special instructions; and, Design Specifications.

3.2.6.3 Purchase Specifications

Purchase Specifications are prepared to purchase engineered equipment and/or services. Purchase Specifications are prepared according to a standard format; however, bulk material and some minor catalog items may be purchased by a Bulk Material Specification.

3.2.6.4 Construction Specifications

When necessary, Construction Specifications are prepared by Engineering to provide requirements for the construction of specific items. Construction specifications may be in a format similar to a Purchase Specification or issued as a Technical Reference Document.

3.2.6.5 ASME Design Specifications

ASME Design Specifications are prepared with sufficient detail to provide a complete basis for design in accordance with the ASME B&PV Code. ASME Design Specifications include, as a minimum:

1. The functions of items including any dimensions upon which functional performance depends.

2. Design requirements, including mechanical and operating loads.

3. Environmental conditions, including radiation conditions.

4. Code classification of items.

5. Definition of boundaries, including dimensional locations, forces, moments, and structural requirements.

6. Material requirements, where applicable.

7. Reference to other documents where operating requirements are defined when the operability of a component is required.

8. Applicable Code by year and addenda.

3.2.6.6 Calculations

Manual and/or computerized calculations are prepared as a basis for system designs.

3.2.6.7 Drawings

Drawings are prepared, according to a standard format, to convey design, purchase, fabrication, and/or construction requirements.

3.2.7 Quality Assurance Review

Quality Assurance reviews and approves procurement specifications prior to issue to ensure that design characteristics can be controlled, inspected, and/or tested and that appropriate inspection and test criteria are identified. In addition, the review also ensures that the design document reflects sufficient acceptance criteria to allow verification that quality assurance activities have been satisfactorily accomplished.

3.2.8 Design Quality Engineering Review

Design Quality Engineering reviews and approves certain design documents, including specifications, drawings, System Design Descriptions, and Technical Reference Documents, to ensure that all applicable design control requirements have been satisfied. As a minimum, these reviews ensure that the document has been prepared, reviewed, and approved in accordance with the applicable procedures; that all review comments have been received, resolved, and incorporated into the document; and that all documentation, which is required to provide evidence that the applicable design control requirements have been satisfied, has been properly prepared and filed. Drawings are reviewed on a randomly selected basis subsequent to their issuance. Design Quality Engineering reports to the Engineering Project Manager and is not a part of the Quality Assurance Department.

3.2.9 Design Interface Control

Internal design interfaces are controlled through review and approval of design documents by individuals and groups whose design activities are contingent upon the design reflected in the documents. Design interface reviews consider pertinent interface parameters, including, configuration, dimensions, process, performance, loads, materials, inspection, testing, operation, safety, and fabrication. These reviews are documented on specific forms to provide objective evidence of their extent and results. In addition, design interfaces are further controlled by ensuring that approved design interface documents are distributed to the reviewing organizations and other individuals and groups using the documents in support of their design activities.

Interface with the NSSS supplier design is controlled through HL&P by identification and review of documents that define NSSS design interfaces with the balance of the plant. Interface with supplier/vendor designs is controlled through the purchasing documents and, in some cases, through the use of written Interface Agreements. Design requirements are identified in the purchase specification.

3.2.10 Design Change Control

Changes originating from Engineering, suppliers, Construction, HL&P, or resulting from the nonconformance system are controlled from their initiation through their approval and distribution to ensure that their effects are properly considered and implemented.

Changes originating from within Engineering can result from design reviews, unsolicited comments, Engineering Design Deficiencies or from other sources such as interfacing designs. Requests for changes from vendors are submitted on a Supplier Deviation Request (SDR). Requests for changes from Construction are submitted on a Field Change Request (FCR) or may result from a Nonconformance Report (NCR). NCRs that are dispositioned use-as-is or repair and such disposition represents a departure from a design document, require a change to a design document through the system described below prior to approving the NCR. Requests for changes originating from HL&P may be transmitted via (1) a numbered letter, which is tracked on an open item list, or (2) a Field Change Request (FCR). In addition, the need for design changes may also originate from the resolution of Audit Deficiency Reports or Corrective Action Requests.

Design changes, regardless of their point of origin, are made through the Design Change Notice (DCN) System. This system includes a special DCN form to ensure that the primary design document is properly identified, the source of the change is listed, in the justification for making the change is described, the effect of the change on the design basis is considered, the technical rationale necessary to ensure the engineering quality of the change is documented, the need to revise other design documents is identified, the need for changes to licensing documents is considered, and that ALARA review of the change has been completed, if necessary. The form also includes adequate space for the necessary review and approval signatures.

Proposed design changes are verified through review and approval of design documents by either the same individuals or groups responsible for verifying the original design or designated alternates. Quality Assurance reviews proposed design changes that affect the quality related aspects of Purchase and Construction Specifications as they are defined by inspection, testing, Code, standard, special process, and/or regulatory requirements. In addition, proposed design changes originating at the construction site either from an FCR or NCR are reviewed by a Change Review Board, either at the Site or in Houston. This board consists, as a minimum of representatives from each of the affected Project Engineering Disciplines, Design Quality Engineering, and Engineering Project Management. The Change Review Board does not actually conduct reviews, but instead ensures that interfacing discipline reviews have been conducted, and if necessary, takes management action where interface problems cannot be resolved at the discipline level.

When change requests originate from the construction site, the Assistant Engineering Manager-Site Design Engineering may approve the change through the DCN System. To ensure that the expertise necessary for the control of design changes is available at the construction site, Engineering maintains a staff of technically qualified Project Site Engineers. These engineers are members of an Engineering Discipline in Houston. Additionally, the DCN system provides the capability, under controlled conditions, for construction to proceed pending approval of the design change by Houston Engineering. In these cases, provisions are made for the construction to be tagged to ensure that it is accessible for repair/rework should the change be disapproved or for final inspection should the change be approved. Once approved, design changes are distributed to all individuals and groups using the original design in support of their activities.

With respect to field activites, the design change system provides for a "real time" maintenance of the as-built configuration. The design documents are revised prior to releasing construction to proceed with the change. Construction and inspection personnel are notified of the change promptly through a computerized tracking system. When construction of an item has been completed, part of the final inspection process will include the verification that the as-built configuration conforms to the design. As-built verification inspection plans will be prepared by Quality Engineering and reviewed by Engineering. These plans will then be used for final inspection and will be included in the records.

3.2.11 Design Deficiencies

Design deficiencies identified in design documents subsequent to their having been design verified are documented, tracked, and closed out using a form titled Engineering Design Deficiencies (EDD). EDD's may also be used to identify, track and closeout deviations from procedural requirements. EDD's may be written by an individual in the Engineering Department who identified such a deficiency. Procedures allow an individual to appeal the closeout of an EDD to the Senior Vice President Power Engineering. Significant EDD's and adverse trends detected as a result of EDD activity are reviewed with the Engineering Project Management at the time of detection.

3.2.12 Records Retention

Design documents and changes thereto are filed and maintained to ensure that a complete record of design development is established and accessible. These records include information necessary to justify the design and provide evidence that design control requirements have been satisfied.

4.0 PROCUREMENT DOCUMENT CONTROL

Brown & Root departments that are responsible for the preparation, or participation in the preparation of Inquiry Packages, Material Requisitions, Purchase Orders and Subcontracts establish procedures to delineate the sequence of activities necessary to prepare, review, approve, issue, and control these documents. The procedures governing these procurement activities also identify the quality requirements, item identification, documentation traceability, technical and commercial requirements that are to be imposed upon Suppliers and Subcontractors. These procedures are reviewed by, and as applicable, approved by Quality Assurance to ensure that the procedures comply with quality requirements. The written procedures regarding the procurement activities ensure that:

1. QA requirements of 10 CFR 50 Appendix B and those applicable ANSI N45.2 Standards and implementing Regulatory Guides are identified in the procurement document.

2. QA requirements are inspectable and controllable, and acceptance and rejection criteria are defined.

3. Procurement documents contain or reference applicable design basis technical requirements including applicable regulatory requirements, drawings, specifications, codes, standards, test and inspection requirements, identification requirements, special process instructions, packaging and shipping instructions.

4. Procurement documents identify the documentation (e.g. drawings; specifications; procedures; inspection and fabrication plans; inspection and test records; personnel and procedure qualifications; material, chemical and physical test results) to be prepared, maintained, and submitted, to the purchaser for review and/or approval.

5. Procurement documents identify those records which require retention, control and maintenance.

6. Procurement documents provide for HL&P and B&R right of access to supplier's facilities and records for source inspection and auditing.

7. Procurement documents include requirements for invoking appropriate quality and regulatory requirements in subtier supplier procurement documents.

4.1 PROCUREMENT DOCUMENT PROCESSING

4.1.1 Procurement of Engineered Equipment

Engineering is responsible for the initiation, development, preparation, and verification of specifications for engineered equipment as defined in Section 3.0 The specification is reviewed and initially approved by Engineering and Quality Assurance. The specification is then sent to Houston Lighting & Power (HL&P) for review and approval. After HL&P approval of the specification and return to Engineering, it is submitted as part of an inquiry package to Purchasing which adds other sections to the package that relate to the commercial aspects.

Purchasing then transmits the completed inquiry package as a Request for Quotation to the prospective bidders.

Bids are re--rned through Purchasing to Engineering and to Quality Assurance. Engineering provides the technical evaluation of the submitted bids, and Quality Assurance provides a quality evaluation. Purchasing performs a commercial evaluation of each bid. Engineering then combines the technical evaluation with the quality and commercial evaluations submitted by Quality Assurance and Purchasing, and prepares a combined bid recommendation for submittal to HL&P.

After receiving HL&P approval to proceed with the recommended procurement action, Engineering prepares, reviews, approves and forwards a Material Requisition to Quality Engineering for review and approval After Quality Engineering approval the Material Requisition is returned to Engineering who forwards the completed requisition to Purchasing. Purchasing then prepares the Purchase Order. The final procurement package, including the Purchase Order, drawings, specifications, procedures, etc., that comprise the total package to be forwarded to the supplier is transmitted to HL&P for approval.

The Purchase Order and any other pertinent commercial/purchasing data is maintained by Purchasing as purchasing records for filing and retrieval purposes. This, and all other documents, including Inquiry Packages, Quotations, and Material Requisitions, which pertain to the Purchase Order is organized and filed in systematic sequence and become the documented and retrievable support of the B&R transaction. The QA Record file for these procurement documents is maintained jointly by HL&P and B&R.

4.1.2 Procurement of Bulk Materials

Engineering is responsible for the initiation, development, preparation, and verification of specification for safety-related bulk materials as defined in Section 3.0 The specification is reviewed and initially approved by Engineering and Quality Assurance. The Specification is then sent to Houston Lighting & Power (HL&P) for review and approval. After HL&P approval of the specification and return to Engineering it is submitted as part of an inquiry package by Engineering to Purchasing which adds other sections to the package that relate to the commerical aspects. Purchasing then transmits the completed inquiry package as a Request for Quotation to the prospective bidders.

Bids are returned through Purchasing to Engineering and to Quality Assurance. Engineering provides the technical evaluation of the submitted bids, and Quality Assurance provides a quality evaluation. Purchasing performs a commercial evaluation of each bid. Purchasing then combines the technical evaluation with the quality and commercial evaluations submitted by Quality Assurance and Engineering, and prepares a combined bid recommendation for submittal to HL&P.

After receiving HL&P approval to proceed with the recommended procurement action, Engineering prepares, reviews, approves and forwards a Material Requisition to Quality Engineering for review and approval. After Quality Engineering approval, the Material Requisition is returned to Engineering for forwarding to Purchasing. Purchasing then prepares the Purchase Order. The final Purchase Order package that comprises the total package to be forwarded to the supplier is transmitted to HL&P for approval.

The Purchase Order and any other pertinent commercial/purchasing data is maintained by Purchasing as purchasing records for filing and retrieval purposes. This, and all other documents including Inquiry Packages, Quotations, and Material Requisitions, which pertain to the Purchase Order is organized and filed in systematic sequence and become the documented and retrievable support of the B&R transaction. The principle difference between bulk material purchases and engineered equipment purchases is that the bulk material items are purchased to manufacturer's specifications consistent with the desired quality, engineering standards, or Code requirements in lieu of B&R Engineering developed specifications.

4.1.3 Procurement Of Subcontracts

Subcontracts are categorized as either Engineering or Field Subcontracts. Engineering Subcontracts are utilized to procure services to a defined scope of work contained in an Engineering Specificaton. This may include specifications and materials on equipment to be furnished under the subcontract. Field Subcontracts are utilized to obtain services in accordance with a specification prepared by Construction or Quality Assurance. The procedures and procurement documents associated with procurement of Engineering Subcontracts are similar to those utilized for the purchase of Engineered Equipment. The associated procurement documents will receive the appropriate Engineering and Quality Assurance reviews as described in Section 4.1.1.

4.2 REVISIONS

Revisions to Engineering Specifications shall be reviewed and approved as described in Section 3.0. Revisions to Purchase Orders/Subcontracts shall be the same as the original as described in subsections 4.1.1 and 4.1.3.

5.0 INSTRUCTIONS, PROCEDURES AND DRAWINGS

Engineering, Materials Management, Construction, and Quality Assurance ensure through planning techniques that activities affecting quality are set forth by written instructions, procedures, and drawings, and are accomplished in accordance with these instructions, procedures, and drawings. Instructions, procedures, and drawings shall include appropriate quantitative (dimensions, tolerances, design limits, etc.) and qualitative (tests, samples, comparative workmanship, etc.) criteria for determining that important activities affecting quality have been satisfactorily completed. Instructions, procedures, and drawings are developed to ensure that applicable documents are made available in a manner commensurate with the schedule of quality related activities on the Project.

5.1 PREPARATION

The responsibility for the origination and maintenance of procedures and instructions is assigned to the organization or department responsible for implementing the activity. Engineering prepares procedures to control engineering activities affecting product quality and for preparing procurement and construction specifications containing definitive qualitative and quantitative acceptance criteria by which it can be determined whether an important activity has been satisfactorily accomplished. Materials Management prepares procedures to control procurement activities. Construction prepares procedures to control the construction activities being performed at the Project site. Quality Assurance prepares QA procedures, QC procedures, nondestructive examination (NDE) procedures, and QA personnel training procedures to control the Project QA activities and to ensure control and compliance with quality requirements by organizations responsible for quality activities. Procedures integrating quality/inspection requirements and other construction or procurement activities may be used. When such procedures are required, procedures are developed defining the preparation, review, approval and issuance of integrated procedures. Reviews and approvals of integrated procedures and revisions thereto are performed by the departments responsible for implementing the activities defined in the integrated procedure.

5.2 REVIEWS

Instruction, procedures, and drawing documents are reviewed and approved as described in other sections of this program. Reviews are made for technical content, appropriate quantitative and qualitative acceptance criteria, Code and regulatory requirements, clarity, and conflict with other documents approved for the Project.

5.3 REVISIONS

Revisions are prepared, reviewed, and approved in the same manner as the original document.

6.0 DOCUMENT CONTROL

Documents used for the design, procurement, and construction of quality-related items are distributed and controlled in accordance with approved Project Procedures.

6.1 DOCUMENT CONTROL - ENGINEERING

Design documents, such as Specifications, System Design Descriptions, Technical Reference Documents, Drawings, and Engineering Procedures that are the responsibility of the Engineering Department are distributed within the Engineering Department and to other organizations by the Engineering Document Control Center (EDCC). Distribution of design documents and revisions are made in accordance with a Master Distribution Schedule established for the Project and augmented by Project Procedures. The recipient of a design document signs an acknowledgement form and returns it to the EDCC to verify receipt of the document or document package. Upon receipt of a design document revision, the recipient destroys the superseded document unless the document is required for reference. In this case, the superseded document is marked "void" by the responsible group or individual. When the retention of the superseded document is no longer required it shall be destroyed. A comprehensive document status list is published at least every two months by the EDCC. The revision status summary provides an up-dated listing of the controlled documents, their revision number, and status. If discrepancies are noted by a document holder, the holder notifies the EDCC to resolve the situation.

6.2 DOCUMENT CONTROL - PROCUREMENT

Procurement documents are controlled as described in Section 4.0 of this program.

6.3 DOCUMENT CONTROL - QUALITY ASSURANCE

Quality Assurance originated documents such as procedures, instructions, and manuals that are controlled under the direction of the Project QA Manager. Distribution and control of QA documents is through the Quality Systems group. Distribution of QA documents and revisions are made in accordance with a log that lists those individuals to whom controlled QA Documents have been assigned. Upon receipt of the QA document or revision, the recipient signs the acknowledgement form and returns it to the Quality Systems to verify receipt of the document. The superseded QA document pages are either destroyed or stamped void or superseded by the recipient. A list of revisions is issued periodically by the Quality Systems to the document holders for review against the document in their possession. If discrepancies are noted by the document holder, the holder notifies Quality Systems to resolve the situation. When a QA document is recalled, a memo is sent to all document holders requesting return of the document. Followup action is taken to ensure that all recalled documents have been returned.

6.4 DOCUMENT CONTROL - CONSTRUCTION

Document control is maintained at the project site by a Document Control Center (DCC). The DCC supervisor reports within the Site Manager's organization. The primary responsibilities of the DCC include the receipt, reproduction, distribution, storage, and retrieval of project document or design documents generated at the site or received at the site through DCC.

Distribution of drawings, specifications and certain other types of design documents or letters, is accomplished through use of a distribution system. A distribution routing is generated which is the instrument used by the DCC to disribute the document copies to the copy-holder files. This involves DCC maintenance of field satellite drawings and other files. The DCC distribution personnel are responsible for delivery and retrieval of drawings and documents to the field locations as directed by the distribution routing. Once the distribution and recovery of superseded document copies are completed, the distribution routing is returned to the DCC system to show the completed distribution and recovery transactions.

7.0 CONTROL OF PURCHASED MATERIALS, EQUIPMENT, AND SERVICES

7.1 EVALUATION AND SELECTION OF SUPPLIERS

The control of purchased items begins with the evaluation and selection of Suppliers. The selection of Suppliers is based on their capability to provide items or services in accordance with the requirements of the Purchase Order or Subcontract, which reflect the regulatory and quality requirements. The Inquiry Packages contain a request for the bidders to submit their QA Manual and to complete a QA Vendor Questionnaire for evaluation by Quality Assurance.

Upon receipt of a bidder's quotation package, Purchasing/ Subcontracts send the QA Vendor Questionnaire and any bidder QA exceptions to Quality Engineering and the QA Manual to the

Audit Section. They review the questionnaire, the QA Manual and any bidder QA exceptions and document the results as delineated in the prescribed QA Procedures. This review ensures that the bidder's quality assurance program meets the applicable quality and regulatory requirements. Results of the evaluation are sent to the Purchasing/Subcontracts and Engineering Departments.

Engineering provides a technical evaluation of the submitted bids, Purchasing/Subcontracts performs a commercial evaluation of the submitted bids. Engineering then combines the technical evaluation with the quality and commerical evaluations submitted by Quality Engineering and Purchasing/Subcontracts, and prepares a combined bid recommendation for submittal to HL&P.

After all quotations have been tabulated and evaluated by Engineering, Purchasing/Subcontracts, and QA, a pre-award audit at the bidder's facility is conducted by Quality Assurance. Following receipt of a satisfactory quality assurance program evaluation and pre-award audit, and the necessary procurement document reviews, Engineering prepares a recommendation for HL&P approval.

7.2 SOURCE INSPECTION

After a Purchase Order has been issued to a selected Supplier, Vendor Surveillance performs the source inspection activities. The degree of source inspection at the Supplier's facility is based upon the relative importance, complexity, and quality of the item being purchased.

Vendor Surveillance prepares an inspection package on each Supplier consisting of Purchase Orders, drawings, specifications, a Vendor Surveillance Plan and special requirements to identify what reviews and inspections are required to be performed. The Vendor Surveillance Plan is prepared by Quality Engineering, with input from other departments as required, to denote the inspection requirements, acceptance criteria, and inspection frequency for initial, in-process, and final shop inspections. From this information, a Vendor Surveillance Schedule is prepared by QA for scheduling inspection trips.

Vendor Surveillance assigns a trained and certified inspector to perform the inspection, when an initial, in-process, or final inspection hold point has been reached. The inspector documents the acceptance or rejection of each inspection hold point.

Prior to shipment, the inspector reviews the required documentation such as Material Test Reports, NDE Reports, and radiographs at the Supplier's facility to ensure the documentation is acceptable and complies with the Purchase Order or Subcontract. If all documentation and test requirements have been met by the Supplier and found acceptable, the inspectors release the item for shipment.

Final inspection or hold point inspections at the vendor's facility may be waived under one of the following conditions:

1. The item is: relatively simple and standard in design, manufacture, and tests; adaptable to standard or automated inspections and/or tests of the item or statistical samples of the item to verify quality characteristics after delivery; and when receipt inspection does not require operations which could adversely affect the integrity, functionability or cleanliness of the item.

2. When sufficient quality history is available to provide an adequate confidence level that the item will meet its intended purpose.

All waivers are documented and approved by the Project QA Manager.

Any deviations or discrepancies noticed by the inspector is discussed with the supplier's QA/QC Manager before leaving the facility. An attempt is made by the inspector to obtain a proposed resolution from the supplier at this time. If the resolution is not acceptable, the inspector initiates a nonconformance report in accordance with Section 15.0 of this program.

7.3 SOURCE AUDITS

Audits are performed by the QA Audit Section during the course of manufacturing activities at a supplier's facilities, in accordance with Section 18.0 of this program.

7.4 RECEIVING INSPECTION

Procedures are established to delineate the method of receiving inspection for purchased safety-related items. Upon receipt of procured safety-related items, the item(s) are inspected to determine the condition of the item, to confirm that identification and traceability requirements have been met, and to confirm that the required documentation as specified in the Purchase Order is attached or previously has been received. Accepted item(s) are received, inspected, identified, and released for controlled storage and subsequent use. Discrepant items are tagged, documented as nonconformances and handled in accordance with Section 15.0 of this program.

8.0 IDENTIFICATION AND CONTROL OF MATERIALS, PARTS, AND COMPONENTS

Project Procedures are established and implemented to provide methods for the identification of items, methods for ensuring traceability of items to documentation, and methods for physically marking such items. Identification markings (serial numbers, symbols, code numbers, tags, etc.) of items are legible and applied so that the function of the item is unaffected. When required by code or regulation, if the material is cut to make more than one piece, the markings are transferred before cutting.

8.1 RECEIVING INSPECTION

Certified personnel are responsible for verifying that received items are identified as required by the Purchase Order. Items found improperly identified are placed in a hold status segregated from the acceptable items, identified and handled in accordance with Section 14.0 of this program. Items found properly identified are documented and processed in accordance with Section 14.0 of this program and transferred to a storage area.

The documentation required by the Purchase Order is also reviewed to ensure the identification numbers on the item(s) received correspond to the identification data on the documentation.

8.2 STORAGE

While the items are in storage, methods are established by responsible Construction personnel to ensure correct identification of the items before releasing them for erection or installation. Storage requirements are described in Section 13.0 of this program.

8.3 IN-PROCESS CONTROL

QC Inspectors verify that proper identification of field installed items as required has been maintained throughout erection or installation. If discrepancies are noted, the item is identified, a hold tag applied, and handled in accordance with Section 15.0 of ths program.

8.4 SUPPLIERS AND SUBCONTRACTORS

Suppliers and Subcontractors are required to establish procedures for the identification and control of items (including partially fabricated subassemblies) so that all segments of the fabrication and manufacturing process can be verified, traced, and checked for compliance with the Purchase Order or Subcontract. Checks and reviews are performed by Vendor Surveillance to ensure that the identification markings correspond at all stages from initial receipt of the order, throughout fabrication to shipment to the site.

9.0 CONTROL OF SPECIAL PROCESSES

The performance and control of special processes are delineated in B&R specifications and procedures prepared by Engineering, Quality Assurance, and Construction, and reviewed and approved by Quality Engineering. These procedures provide a method for procedural and personnel qualifications used to perform special processes and for the performance of special processes under environmentally controlled conditions. Quality Engineering ensures that special processes are performed in accordance with applicable Project Procedures, Code and regulatory requirements.

Suppliers and Subcontractors are required by B&R to establish procedures for the control of special processes at their facilities. Quality Engineering and Engineering review and approve their procedures before implementation to ensure the procedures satisfy the applicable Code and regulatory requirements and the QA Program.

9.1 NONDESTRUCTIVE EXAMINATION (NDE)

9.1.1 Nondestructive Examination Procedures

Nondestructive examinations are performed using NDE procedures approved by a B&R NDE Level III. Before their use, the procedures are qualified and documented by the NDE Level III to ensure compliance with the Code and regulatory requirements. These procedures define the NDE methods required to be qualified, responsibilities for preparation of the NDE procedures, minimum content of the procedure, equipment to be used, test specimens required, essential variables that require procedure requalification, and documentation and witnessing requirements.

9.1.2 Nondestructive Examination Personnel

Training and certification of NDE personnel is in accordance with the Quality Assurance personnel training procedures which meet the requirements of the American Society for Nondestructive Testing Practice SNT-TC-1A, 1975. The Quality Assurance personnel training procedures provide a program which defines responsibilities, certification, recertification, qualification, examination, training, and experience requirements; minimum grades for qualification examination; and specific documentation and physical requirements.

The NDE Level III is responsible for the certification and recertification of all B&R NDE personnel and for the maintenance of all documentation related to their qualification, certification, and experience.

9.2 WELDING

9.2.1 Welding Procedure Specifications and Procedure Qualifications

Materials Engineering establishes specifications defining the administrative and functional controls to be exercised when establishing welding procedure specifications. These administrative and functional controls define, as a minimum:

1. The programmatic requirements necessary to control the accomplishment of activities, including prerequisites and subsequent issuance of welding procedure specifications.

2. The responsibilities and qualifications of personnel involved with qualifying welding procedure specifications.

3. The requirements and controls of weld and base metals used during qualification of welding procedure specifications.

4. The documentation required for back-up support of the welding procedure qualification report.

5. The interface requirements between Materials Engineering and QA to be in effect during the welding procedure specification qualification process.

Welding procedure specifications are qualified in accordance with the Code or standard referenced in the appropriate engineering specification for safety-related items. Welding procedure specifications are qualified under the direction of Materials Engineering and approved by Quality Engineering before their use in production.

9.2.2 Welders and Welding Operators Performance Qualifications

Personnel selected to perform welding functions are qualified in accordance with the requirements of the Code or standard referenced in the appropriate engineering specification for safety-related items. Performance tests used to qualify welders and welding operators are administrated by the Project Welding Engineers and surveillance performed by QC Inspectors. A file of welders, welding operators, and their qualification is maintained by the Site DCC or QA vault.

Each qualified welder or welding operator is assigned a weld symbol for use in identifying their welds, and such symbols are controlled by the use of a log maintained by the Project Welding Engineer. These symbols are not reassigned to another welder or welding operator during the life of the project.

9.2.3 Control of Welding Materials

The Project Welding Engineer prepares requisitions for the purchase of welding materials such as electrodes, fluxes, and gases. These requisitions, which contain all the quality control requirements as well as appropriate procurement specifications, are reviewed and approved by the Project Welding Engineer and Quality Engineering before transmitting them to Purchasing for procurement.

Upon receipt of welding materials, Quality Control inspects the material in accordance with Section 7.0 of this program to ensure compliance to the procurement documents. If the material is acceptable, it is transferred to a controlled welding materials warehouse. Materials for safety-related work is clearly identified until the material has been consumed. Issuance of welding materials to crafts is the responsibility of the Project Welding Engineer. Welding materials, when issued to the craftsman, are maintained in containers or handled to avoid contamination.

9.2.4 Control of Welding Processes

Welding is controlled through Construction procedures that implement the requirements of specifications established by Materials Engineering. The procedures define a sequence of operations necessary for the welding of items. These specifications also identify the special process to be used, the methods used for establishing hold points, and any documentation requirements.

The Project Welding Engineer prepares Weld Data Cards (WDC) for safety-related ASME welds. After the WDC is prepared, it is reviewed by Quality Engineering to ensure required inspection hold points are included and reference is made to the applicable isometric, welding procedure specification, and field weld number. During production welding, the applicable WDC remains in the immediate area, and when a designated hold point is reached, further operation is not started until satisfactory verification of QC inspection has been established as evidenced by sign-off of the QC inspector. After welding is completed, the WDC is transferred to the Project Welding Engineer for final review and approval. All documentation accumulated on each weld is attached to the WDC for review purposes. Following approval by the Project Engineer, the WDC is reviewed and approved by Quality Engineering; and the total documentation package is then forwarded to the QA Vault for permanent storage.

9.2.5 Repairs to Base Metal and Weld Metal

Repair and examination of base and weld metal are made in accordance with written procedures prepared by the Project Welding Engineer using qualified welding and NDE procedures, and certified inspectors and welders. The methods of reinspection of base metal repair are in accordance with written repair and NDE procedures. The methods of reinspection of weld metal repair are at least the same as the one performed on the original weld.

9.3 HEAT TREATMENT

When post weld heat treatment is required, it is performed to the applicable welding procedure specification and to the specified post-weld heat treatment procedures. Preheat and interpass temperature controls is in accordance with the applicable welding procedure specification. These procedures are approved by Quality Engineering before their use.

9.4 BENDING

Procedures are established and qualified for the bending process. Engineering reviews and approves the bending procedures prior to their use. The bending procedure qualification tests and procedure requirements require the following:

1. Number and location of test specimens;

2. Strain calculations;

3. Testing on simulated similar items to be bent;

4. Impact testing, when required;

5. Minimum thickness required; and

6. Cross-sectional diameters, ovality and shape tolerances.

9.5 CHEMICAL CLEANING CONTROL

Chemical cleaning is required to be performed in accordance with written procedures prepared by Construction and reviewed and approved by Quality Engineering. Cleaning activities are performed by trained personnel and monitored by certified Quality Control inspectors.

10.0 INSPECTION

Planned, written procedures for in-process and final examinations and inspections are prepared by Quality Engineering to ensure conformance with documented instructions, procedures, and drawings. These procedures, when necessary, provide step-by-step instructions. To ensure that the procedures are carried out and results are documented, detailed inspection reports, drawings, and/or checklists are made a part of the procedures for use by inspecting personnel.

Inspection procedures, instructions, and checklists contain, as applicable, the following prerequisities:

1. Identification of characteristics to be inspected;

2. Identification of the individuals responsible for performing the inspection operation;

3. Acceptance and rejection criteria;

4. A description of the method of inspection including equipment to be used;

5. Verification of completion and certification of inspection;

6. A record of the results of the inspection operation, and

7. Mandatory hold points.

Suppliers and Subcontractors are required to establish procedures for in-process and final examinations, tests and inspections at their facilities. These procedures comply with the applicable quality and regulatory requirements.

10.1 INSPECTION PERSONNEL

QC Inspectors are trained and/or certified in accordance with Quality Assurance personnel training procedures. The responsibilities of the shop and field inspectors includes visual and physical inspection of the work or items; verification of documentation; identifying Quality Assurance and Quality Control problems; recommending, proposing, or initiating action leading to a resolution of any recognized problem; and verifying the corrective action taken is acceptable.

To ensure independence of the inspection group from the group performing the activity, QC inspectors report to the QC Manager who reports to the Project QA Manager. Vendor Surveillance inspectors report to the Vendor Surveillance/Houston Coordination Manager who reports to the Project QA Manager so that their independence from the group performing the activity is ensured.

IMAGE EVALUATION
TEST TARGET (MT-3)

150mm

6"

IMAGE EVALUATION
TEST TARGET (MT-3)

1.0 1.1 1.25 1.4 1.6 1.8 2.0 2.2 2.5 2.8 3.2 3.6 4.0

150mm

6″

10.2 HOLD POINTS

10.2.1 Suppliers

Before the start of any manufacturing or fabrication process at a supplier facility, Quality Engineering will determine if in-process shop inspection is necessary. This determination is based on the complexity of the process and the past performance history of the supplier. If it is determined that in-process inspection is necessary, Quality Engineering with the cooperation of the supplier establishes hold points beyond which the manufacturing or fabrication will not proceed without a shop inspection by Vendor Surveillance. Waiver of such hold points is made by the Project QA Manager.

10.2.2 B&R Construction and Fabrication

Before the start of a B&R construction activity or fabrication process at the project site, Quality Engineering will review the process and determine if in-process inspection is necessary. This determination will be based on the complexity of the activity or process, the engineering specifications, quality and regulatory requirements, and history of project or industry related problems for the specific activity. If it is determined in-process inspection is necessary, Quality Engineering establishes hold points with Construction beyond which point that activity or process will not proceed without a QC inspection.

10.3 INDIRECT CONTROL OF INSPECTIONS

If physical inspections of items or processes are impossible or disadvantageous, a documented system of indirect control by monitoring processing methods, equipment and personnel functions is provided. Both physical inspection and process monitoring is provided when control is inadequate without both.

10.4 INSPECTION OF REPAIRED ITEMS

Inspections that are performed on repairs, modifications, and replacements are performed as required in written approved procedures.

11.0 TEST CONTROL

Test control procedures are established by Engineering for design operability/ qualification, by Construction for testing of special processes, and by suppliers and subcontractors for product integrity tests. The responsible organizations also establish and implement procedures that when followed, demonstrates the item will perform satisfactorily in service and meet the requirements of the Design Specifications. These procedures are reviewed by Quality Assurance to ensure compliance with quality or regulatory requirements before implementation.

11.1 TEST PROCEDURES

Testing is performed in accordance with written test procedures that incorporate or reference the performance or qualification test requirements included in the Design Specifications or other procurement documents.

Test procedures also specify the necessity for the following test prerequisites:

1. Calibrated instrumentation;
2. Adequate and appropriate equipment;
3. Trained, qualified and certified personnel;
4. Preparation, condition, and completeness of the test item to be tested;
5. Suitable and controlled environmental conditions;
6. Mandatory inspection hold points for witness;
7. Provisions for data collection and storage;
8. Acceptance and rejection criteria, and
9. Methods for documenting or recording test data results.

As an alternate, the required tests may be specified by reference to proper Codes, standards, and approved procedures which state criteria, acceptance levels, required examinations, and certification requirements.

11.2 INSPECTION OF TESTS

In-process and final inspection of testing activities at the site are in accordance with Section 10.0 of this program to ensure that adequate controls are established.

11.3 DOCUMENTATION

All test results are documented by the organization that performed the tests. The test results are evaluated by the organization requesting and/or performing the tests to ensure the completed tests have met the requirements established in the test procedures and design specifications.

12.0 CONTROL OF MEASURING AND TEST EQUIPMENT

Procedures provide for methods to calibrate and identify Measuring and Test Equipment (M&TE), to notify Quality Control and Construction of the status of M&TE, and to recall suspected or damaged M&TE. Testing Laboratories and Subcontractors used for calibration of M&TE establish a system for the calibration of M&TE which complies with quality and regulatory requirements. Quality Engineering reviews Testing Laboratories/Subcontractors' system to ensure it is a satisfactory program.

12.1 CALIBRATION STANDARDS

Measuring and test equipment required to be calibrated are calibrated against measurement standards having known relationship to national standards where such exist. Where required by National standards or other standards, reference standards are maintained and used in an environment having the necessary temperature, humidity, and/or contamination controls, and are supported by certificates attesting to the date, and accuracy (conditions where applicable) under which the results were furnished. If no reference standards exist for a particular piece of M&TE, the basis of calibration is in accordance with the Manufacturer's recommendation.

Calibration standards are not required for standard off-the-shelf measuring equipment which is not likely to change or drift during usage. Such devices are rulers, scales, and tape measures which need only to be inspected for evidence of damage or deterioration before usage.

12.2 CALIBRATION OF MEASURING AND TEST EQUIPMENT

As described in procedures, all measuring and test equipment are calibrated and properly adjusted at specified periods or use intervals so accuracy is maintained within specified limits. Before calibration, all M&TE is assigned and permanently identified with a serial number in an area of the instrument that will not damage the instrument or interfere with its use. M&TE is calibrated by trained personnel under the surveillance of the Site Surveillance Group to ensure proper calibration procedures are available and used in the calibration process. The calibration of all M&TE is documented; Quality Engineering reviews these reports on a random basis.

A M&TE Master Index is maintained. The index identifies the calibration status, interval, item identification, and any condition affecting measurement control. The index is periodically reviewed by Quality Engineering to ensure they are complete and that they reflect the current status of all the referenced standards and M&TE.

All M&TE which are calibrated is labeled with a calibration label. The label will state calibration date, the calibrator, and the next calibration due date. This will complement the records maintained on each piece of M&TE and will readily aid the user in determining if a piece of equipment is within its next calibration due date.

12.3 DAMAGED EQUIPMENT

Measuring and test equipment found damaged in service or improperly maintained is identified and segregated from the calibrated M&TE and its calibration sticker removed. After the M&TE has been repaired and accuracy verified, a new calibration sticker is affixed on the M&TE and the item placed back in service.

12.4 INACTIVE EQUIPMENT

Measuring and test equipment that is inactive because of temporary or permanent termination of a construction activity, is identified by affixing an inactive sticker to the equipment or segregating it from the active calibrated equipment.

12.5 NONCONFORMANCES

When nonconformances are noted and the M&TE is used for final acceptance testing while out of calibration, a nonconformance report in accordance with Section 15.0 of this program is prepared. An evaluation is conducted to determine the validity of previous inspections subsequent to the calibration check. The corrective action is reviewed, and when deemed necessary, the item is reinspected using properly calibrated equipment.

12.6 TESTING LABORATORIES

If B&R elects to use standard testing laboratories to perform calibration services, they are approved before award of contract in accordance with Section 7.0 of this program. Certification traceable to national standards (where such exist) are provided for all calibrations performed and transmitted to B&R for record storage and filing.

12.7 ISSUANCE OF MEASURING AND TEST EQUIPMENT

Before the issuance of M&TE, the facility attendant checks equipment and logs out the equipment. Upon return of the issued equipment, the attendant notes the return and condition of the equipment.

13.0 HANDLING, STORAGE, AND SHIPPING

Detailed procedures have been developed and implemented to ensure that handling, storage, shipping, and preservation of items are performed in accordance with approved instructions, procedures, quality and regulatory requirements. The implementation of the procedures are performed by personnel who are trained and aware of the requirements of the procedures. These procedures are reviewed and approved by Quality Assurance before their implementation. Engineering also reviews and approves the procedures for engineered items.

13.1 SHIPPING

Engineering specifications and Purchase Orders provide adequate instructions for marking and labeling items and their shipping containers. Marking is adequate to identify, maintain, and preserve the shipment, including the indication of the presence of special environments or the need for special controls such as handling. All safety-related items are suitably protected during shipment to prevent damage or deterioration of the item from environmental conditions.

13.2 STORAGE

After receiving inspection has been performed, as outlined in Section 7.0 of this program, items are stored in appropriate areas as determined by Engineering specifications and Manufacturer's recommendations. Storage levels are comparable to levels required for packaging and shipping. Storage facilities have controlled access to the extent required to prevent unauthorized personnel from obtaining items. Maintenance, care, and protection of items are delineated in Construction or Material Management Procedures or as specified in the Manufacturer's instruction to prevent damage, deterioration, or loss by environmental conditions. The withdrawal of items from storage is controlled by procedures to confirm that correct items are being released.

13.3 HANDLING

Items transferred to or removed from storage are handled by Construction personnel in accordance with procedures. When specified, critical, heavy, and major items are handled in accordance with the Manufacturer's instructions. Special handling tools and equipment are provided and controlled as necessary to ensure safe and adequate handling.

13.4 PRESERVATION

Items subject to deterioration and damage from exposure to air, moisture, or other environmental conditions while in storage are kept preserved in accordance with the Manufacturer's instructions and applicable B&R specifications and procedures.

13.5 SPECIAL ITEMS

When necessary for items such as critical, sensitive, perishable or high value articles, specific procedures are written for the handling, storage, packaging, shipping, and preservation of these items. These procedures include requirements for special coverings, special protective environments, specific moisture content levels, and temperature levels. These special items are specified in engineering documents.

14.0 INSPECTION, TEST, AND OPERATING STATUS

Responsible departments establish and implement procedures to identify the inspection, test, and operating status of processes and items. These procedures define areas requiring controls, describe tags, stamps, labels, cards, and checklists provided to accomplish the intent of this section, and provide for the development of other means of status identification during the design, procurement, and construction phases. The authority and approvals required for originating or removing status indicators are also described in the applicable procedures.

14.1 INSPECTION AT SUPPLIER'S SHOP

Upon the approval and issuance of a procurement document, an Engineering specification and other related documents, the status of inspection and test activities at the Suppler's Facility is controlled by Vendor Surveillance through the use of the Vendor Surveillance Plan and Vendor Surveillance Report, Inspector's stamps, and other status indicators noted in procedures applicable to the source inspection activity.

14.2 RECEIVING INSPECTION

Upon the receipt of safety-related items from the Supplier, receiving inspection is performed in accordance with Section 7.0 of this program and applicable procedures specifying the use of tags, stickers or other indicators applicable to the receipt inspection activity.

14.3 IN-PROCESS CONTROL

The processing, fabrication, installation, or testing of materials and equipment by Construction in accordance with Project documents and Construction Procedures is reviewed, monitored, and inspected by QC Inspectors. The QC Inspectors use defined indicators as specified by Project procedures to note the status of the construction activities.

14.4 NONCONFORMANCES

Nonconformances shall be indicated on Nonconformance Reports as explained in Section 15.0 of this program. Tags, stickers or other indicators are also used to identify the status of nonconforming items and their resolution.

14.5 CONTROL OF STATUS INDICATORS

The control, issuance, use, and removal of status indicators is the responsibility of the organization originating the status indicator.

14.6 SUPPLIERS AND SUBCONTRACTORS

Suppliers and Subcontractors are required to establish and implement a program to identify the examination and process status of the purchased material or equipment.

15.0 NONCONFORMING MATERIALS, PARTS OR COMPONENTS

Quality Assurance has established written procedures describing the controls used for the identification, documentation, segregation and disposition/resolution of nonconformances. These procedures identify individuals who are delegated the responsibility and authority to approve the disposition of a nonconformance report and establish methods of analyzing nonconformance reports for quality trends. Nonconformances are deficiencies in characteristics, documentation or procedures which render the quality of an item unacceptable or indeterminate.

The documentation used by B&R for nonconformances identifies the material or item, describes the nonconformance, describes the disposition or resolution and includes approval signatures for the disposition.

15.1 IDENTIFICATION

It is the responsibility of all B&R employees to report any nonconformance to B&R Quality Assurance. Upon identification of a nonconformance as defined, a Nonconformance Report (NCR) is issued by Quality Assurance.

The Nonconformance Report is completed stating the nonconformance insofar as violation, events and/or physical conditions pertaining to the nonconformance. Supporting documentation is referenced or attached to the report if the documentation aids in understanding the nature of the nonconformance.

15.2 SEGREGATION

Nonconforming items are tagged to note the nonconforming condition. If the item cannot be easily tagged, documentation traceable to that item is used to denote its nonconforming condition. Where practical, nonconforming materials, parts or components are segregated from acceptable items while in a hold status to prevent their inadvertent use.

15.3 APPROVAL FOR ISSUANCE

Nonconformance Reports, after being prepared, are reviewed by Quality Engineering to ensure completeness and accuracy of the information stated. Any misunderstandings are resolved by Quality Engineering conferring with individuals reporting the nonconformance. If satisfactory, the nonconformance report is approved.

15.4 DISPOSITION AND IMPLEMENTATION

If nonconforming items or conditions identified during construction activities can be reworked to original design configuration or brought into compliance through a "standard repair procedure", the NCR is dispositioned by the Lead QC Inspector and the Construction General Foreman. Once the disposition is complete, the QC Inspector removes the hold tags and work may proceed. NCR's falling into this category are forwarded to Quality Engineering for review, written approval, and record retention. Since no design evaluation is required, it is not necessary to include these NCR's in the Material Review Board process.

NCR's requiring design evaluation (i.e. those NCR's indentified as "repair" or "use-as-is") are forwarded by Quality Engineering to the Materials Review Board (MRB). The MRB is an on-site committee responsible for providing dispositions to all NCR's requiring design evaluation. Concurrence by both the Engineering and Quality Engineering representatives is required for disposition of an NCR. When the MRB review has been completed, the signed NCR, with disposition noted is provided to HL&P Quality Assurance for review of disposition to ensure concurrence that QA program requirements have been implemented. During the construction phase only, if a disposition cannot be readily obtained, the Site Manager may request of the Project QA Manager a temporary waiver to allow controlled use of a nonconforming item.

The implementation of disposition of nonconformances is assigned to:

1. Brown & Root Construction, when the nonconformance pertains to fabrication, erection, or construction activities performed by B&R or B&R's subcontractors/vendors; or

2. Brown & Root Quality Assurance when the nonconformance pertains to quality assurance/control activities performed by B&R or B&R's subcontractors/vendors; or

3. Brown & Root Engineering when the nonconformance pertains to design activities and/or engineered materials procured by B&R; or

4. Houston Lighting & Power when the nonconformance pertains to activities and/or materials procured by the NSSS Vendor.

Items dispositioned "repair" are repaired in accordance with approved procedures and re-inspected by at least the same methods that found the nonconformance. Items dispositioned "scrap" are tagged and are segregated to prevent their inadvertent use prior to their disposal.

15.5 REMOVAL OF TAGS

Upon final close-out, all tags indicating the nonconforming status of the material or item are removed by Quality Assurance.

15.6 NONCONFORMANCE TRENDS

Trend analysis is a systematic review of nonconformance experience to prevent future nonconformance by identifying and eliminating underlying causes of past incidents.

The trend analysis program serves as a reliable method for collecting data, an effective means of reporting the data, and a vehicle for instituting corrective action when adverse trends are identified. Quality Systems identifies the methods to be used to collect data, the ways to categorize and monitor deficient conditions by the use of quality indicators, data normalization and graphic representation, and the methods of reporting this information to management.

Trend analysis procedures define the list of documents that will be trended. Examples of documents included in the list are: Nonconformance Reports; Corrective Action Requests; Audit Deficiency Reports; Engineering Design Deficiencies; and Vendor-Related Reports identifying nonconformances.

The results of the trend analysis are reported to Quality Engineering for their review of suspect areas to determine whether the incidents that make up a trend have a common cause. If a common cause is identified, Quality Engineering will issue a Corrective Action Request for recurrence control. Once a corrective action is undertaken, Quality Engineering follows up and assures that the corrective action is satisfactory and properly implemented.

15.7 STOP WORK ORDER (SWO)

The identification of a nonconforming condition may warrant a the Project QA Manager to stop work on a particular operation until proper disposition of the deficiency has been approved. Characteristics that warrant a Stop Work Order (SWO) are established in applicable project procedures. If stop work action is warranted, the affected organization is verbally notified by the Project QA Manager. A Stop Work Order documenting the reason work was stopped is initiated and issued to the affected organization. Authorization to resume work affected by a SWO is given by the Project QA Manager when responses, corrective actions, recurrence controls and other requirements have been satisfactorily responded to and have been determined to be acceptable.

16.0 CORRECTIVE ACTION

Procedures ensure that conditions adverse to quality are promptly identified, corrected, and action taken to prevent recurence. These procedures also include a system for identifying and reporting significant deficiencies to HL&P and for instituting corrective action.

Nonconforming materials or items are identified and documented on Nonconformance Reports, as described in Section 15.0 of this program. If corrective action is required, as deemed necessary by Quality Engineering after their review of an NCR, a Corrective Action Request (CAR) is initiated. CAR's may also be issued to identify for correction, significant or repetitive conditions adverse to quality.

The CAR's have specified time limits for taking responsive action and may constrain or hold work on specific tasks. A failure to respond within the time limits may result in issuance of a Stop Work Order. After a CAR is issued, Quality Engineering determines when corrective action has been taken, and whether it was effective in preventing recurrence of the problem. A Stop Work Order may be issued if it is found that the corrective action has been ineffective.

17.0 QUALITY ASSURANCE RECORDS

Brown & Root has established a record management program in which storage, control, retention, and accessiblity of QA records are listed; origination and retention responsibilites are defined; and retention times are listed. Procedures have also been established which outline the specific identification system and categories to facilitate interface with the identification used by the Nuclear Steam Supply System (NSSS) and other suppliers.

17.1 PROCESSING OF QUALITY ASSURANCE RECORDS

All QA records are reviewed for conformance to requirements, legibility, completeness, and traceability to the item or activity being documented.

17.2 STORAGE

Quality Assurance records retained at the Houston offices or at the Site are stored in central files within Engineering, Procurement, or Quality Assurance. Duplicate QA record storage facilities are maintained in separate and remote locations. The QA records storage facility at the Site is constructed and located to protect the contents from possible destruction by causes such as fire, floods, tornadoes, insects, rodents, and from possible deterioration by a combination of extreme variations in temperatures and humidity conditions and may be used in lieu of duplicate storage.

17.3 FILING

QA records are filed in such a manner as to provide timely retrieval. An index system is established to identify QA records, where records are stored, and the location of the records within the storage area.

17.4 ACCESS CONTROL

The cognizant managers maintain a list of personnel who have been authorized admittance to the respective record storage areas. Personnel not on the list may be admitted to the storage areas with approval from the cognizant managers only.

17.5 REMOVAL OF QUALITY ASSURANCE RECORDS

Records may be examined within the storage area. Methods are established to control the removal and return of QA records from the storage facility. These methods reflect the following:

1. Approval by the cognizant Manager for removal of each record.

2. Logging of the record to be removed and the date of removal.

3. Individual obtaining the record and date to be returned.

4. Follow-up to assure timely return of the records.

17.6 REVISION

Quality Assurance records may be supplemented or revised. These supplements or revisions are originated, processed, and distributed in the same manner as the original records.

17.7 DISPOSITION

QA records are retained at the prescribed location by the assigned organization according to procedures, until the records are required by HL&P.

18.0 AUDITS

A system for both internal and external audits is established in QA procedures approved by the QA Manager - Power Group and implemented by the Q.A. Audit Manager. These procedures specify requirements for training and qualifying auditors, planning and scheduling audits, implementing an audit, preparing a formal audit report, and resolving any audit findings. Internal audits include all B&R activities and external audits include the activities of Suppliers and Subcontractors.

A system of management audits shall also be established to audit the activities of Quality Assurance and to verify compliance with, and effective implementation of, all aspects of a QA Program.

18.1 QUALIFICATIONS OF AUDITORS

Personnel performing audits are trained and qualified in accordance with the Quality Assurance personnel training procedures. Personnel qualified to perform audits are independent of any direct responsibility for the activities being audited. At least one audit team member must be experienced or trained in the discipline being audited.

18.2 PLANNING AND SCHEDULING AUDITS

Audit functions are prescheduled and documented by the QA Audit Manager. The frequency of audits is based on the safety importance and status of activities being performed. Each element of the complete QA program, including site activities, is audited at least annually.

Supplemental audits are performed, as required, when significant changes are made in functional areas of the QA Program, when there are repetitive nonconforming conditions, or when it is necessary to verify implementation of required corrective action. These audits are requested by either the Project QA Manager or the QA Manager-Power Group.

18.3 IMPLEMENTATION OF AUDITS

Audited organizations receive written notification before a scheduled audit in order to establish proper interface. Personnel performing the audit prepare an audit checklist consisting of questions extracted from applicable specifications, codes, plans and/or procedures to which the audited organization is committed. The audit checklist is reviewed and approved by the QA Audit Manager or his identified designee. On the date of the audit, a preaudit meeting is conducted with the management of the audited organization to discuss the audit sequence and to establish channels of communications. After the preaudit meeting, the audit is conducted and results recorded on the audit checklist. At the conclusion of the audit, a post-audit meeting is held to discuss the audit findings with management personnel of the audited organization. Corrective action responsibilities are assigned, and response times are established.

18.4 AUDIT REPORTS

After the audit is completed, a formal audit report is prepared by the audit team leader and forwarded to the QA Audit Manager or his identified designee for approval. This report contains, as a minimum, an analysis of observations/recommendations, the indentification of individuals contacted during the audit, the scope of the audit, and any Audit Deficiency Reports (ADR).

The audit report is issued within 30 days after the audit and sent by formal letter to the audited organization, HL&P, the Project QA Manager, the QA Manager - Power Group, and the QAMPB members.

18.5 AUDIT DEFICIENCIES

All deficiencies noted by an auditor are noted on the audit checklist and formally documented on an ADR. The audited organization documents the corrective action taken or to be taken, including action to prevent recurrence of the deficiency on the ADR, and returns the ADR to the QA Audit Manager.

The QA Audit Manager or his identified designee reviews the corrective action taken to ensure it will resolve the deficiency. If the corrective action is found to be satisfactory, the ADR is closed unless verification is required. Follow up action is performed by verification of corrective action when necessary. Audit deificencies that cannot be resolved at the Project level shall be referred to the next meeting of the QAMRB for resolution.

TABLE 1

PROJECT QUALITY ASSURANCE DEPARTMENT FUNCTIONS

Quality Engineering

1. Reviews Purchase Orders for compliance with QA requirements.

2. Reviews selected design documents for compliance with QA requirements.

3. Reviews and approves nonconformance reports.

4. Reviews design change notices and field change requests for compliance with QA requirements.

5. Prepares quality control inspection plans in conjunction with Construction Engineering.

6. Reviews and approves quality-related construction record packages.

7. Resolves QC technical problems.

8. Reviews and approves quality/construction procedures.

9. Prescribes training programs for QA personnel qualification and certification.

Quality Control

1. Inspects construction activities as directed by Quality Engineering in their inspection planning instructions.

2. Assures certified QC inspectors are utilized.

3. Coordinates and reports construction inspection results.

4. Prepares nonconformance reports as required.

5. Assures inspection equipment is properly qualified and calibrated.

6. Performs nondestructive examination on site for B&R activities.

TABLE 1

PROJECT QUALITY ASSURANCE DEPARTMENT FUNCTIONS
(Continued)

Quality Systems

1. Prepares and maintains the Project QA Manual.

2. Coordinates preparation of QA procedures.

3. Coordinates B&R QA Records turnover.

4. Maintain site QA records.

5. Coordinates draft responses to Site NRC Inspection Reports.

6. Coordinates responses to HL&P and B&R site audits.

7. Prepares monthly QA operations reports and quarterly QA nonconformance trend analysis reports.

8. Coordinates QA training and certification program.

Vendor Surveillance/Houston Coordination

1. Performs vendor inspections as required by Quality Engineering in their inspection planning instructions.

2. Assures certified Vendor Surveillance inspectors are utilized.

3. Coordinates and reports vendor inspection results.

4. Prepares nonconformance reports as required.

5. Coordinates corporate audits and corrective actions.

6. Coordinates QA activities related to Engineering and Procurement activities.

7. Coordinates responses to HL&P and B&R audits other than site audits.

TABLE 1

PROJECT QUALITY ASSURANCE DEPARTMENT FUNCTIONS
(Continued)

Site Surveillance

1. Assures qualified personnel are utilized.

2. Schedules and conducts surveillance programs on site activities.

3. Assures adequacy of corrective action resulting from their surveillance activities.

4. Reports results of surveillance activities to the Project QA Manager.

TABLE 2

ANSI STANDARD AND REGULATORY GUIDE COMPLIANCE

The B&R STP Quality Assurance Program complies with the following ANSI Standards and implementing Regulatory Guides except as noted:

STANDARD	TITLE
ANSI N.45.2-1971 R.G. 1.28(Rev.0,6/72)	Quality Assurance Program Requirements for Nuclear Facilities
ANSI N.45.2.1-1973 R.G. 1.37(Rev.0,3/73)	Cleaning of Fluid Systems and Associated Components During Construction Phase of Nuclear Power Plants
ANSI N.45.2.2-1972 R.G. 1.38(Rev.0,3/73)	Package, Shipping, Receiving, Storage and Handling of Items for Nuclear Power Plants
ANSI N.45.2.3-1973 R.G. 1.39(Rev.0,3/73)	Houskeeping During the Construction Phase of Nuclear Power Plants
ANSI N.45.2.4-1972 R.G. 1.30(Rev.0,8/72)	Installation, Inspection and Testing Requirements for Instrumentation and Electric Equipment During the Construction of Nuclear Power Generating Stations
ANSI N.45.2.5-1974 (see Notes 1 and 2)	Supplementary Quality Assurance Requirements for Installation, Inspection and Testing of Structural Concrete and Structural Steel During the Construction Phase of Nuclear Power Plants
ANSI N.45.2.6-1973 R.G 1.58(Rev.0,8/73)	Qualifications of Inspection, Examination and Testing Personnel for the Construction Phase of Nuclear Power Plants
ANSI N.45.2.8 (Draft 3, Rev.3, 4/74)	Supplementary Quality Assurance Requirements for Installation, Inspection and Testing of Mechanical Equipment and Systems for the Construction Phase of Nuclear Power Plants
ANSI N.45.2.9-1974 R.G. 1.88(Rev.0,8/74)	Requirements for Collection, Storage and Maintenance of Quality Assurance Records for Nuclear Power Plants
ANSI N.45.2.10-1973 R.G. 1.74(Rev.0,2/74)	Quality Assurance Terms and Definitions

TABLE 2

ANSI STANDARD AND REGULATORY GUIDE COMPLIANCE
(Continued)

STANDARD	TITLE
ANSI N.45.2.11-1974 R.G. 1.64(Rev.2,6/76)	Quality Assurance Requirements for the Design of Nuclear Power Plants
ANSI N.45.2.12 (Draft 3, Rev.4, 2/74) (see Note 3)	Requirements for Auditing of Quality Assurance Programs for Nuclear Power Plants
ANSI N.45.2.13 (Draft 2, Rev.4, 4/74)	Quality Assurance Requirements for Control of Procurement of Items and Services for Nuclear Power Plants
ANSI N.101.4-1972 R.G. 1.54(Rev.0,6/73)	Quality Assurance Requirements for Coatings Applied to Water Cooled Nuclear Power Plant

Exception Notes

1. ANSI N.45.2.5-1974, Section 4.8, states "Pumped concrete must be sampled from the pump line discharge". In lieu of this statement, in-process strength samples of pumped concrete are taken at the delivery point. Correlation tests of air content, slump, and temperature are performed to verify these plastic properties of the concrete at the placement point in accordance with the following frequency requirements:

   A. A minimum of 2 correlation tests are performed for each pumped placement exceeding 200 cu. yds.

   B. Otherwise, a minimum of 2 correlation tests per week are performed when any individual pumped placement during a week requires delivery of more than one truckload of concrete.

   C. During a week when a pumped placement exceeding 200 cu. yds. is made, the correlation tests performed on that placement will satisfy the weekly requirement for performing two correlation tests as specified in Item B above.

   When any of the specified limits and tolerances on loss of air content, slump, or temperature are exceeded at the placement point, correlation tests between the delivery point and placement point will be accomplished for each 100 cu. yds. of concrete placed as

TABLE 2

ANSI STANDARD AND REGULATORY GUIDE COMPLIANCE
(Continued)

long as limits and tolerances are exceeded. If two consecutive tests are out of tolerence, corrective action will be implemented to assure that subsequent loads awaiting discharge into the pump are within tolerances for the placement. This will be accomplished by adjusting the plastic property requirements of the concrete at the pump intake.

"Correlation Tests", "Delivery Point", and "Placement Point" are as defined in ANSI N.45.2.5-1978, Section 1.4.

2. Samples and frequency for cadweld testing is in accordance with ACI-359/ASME Section III, Division 2, issued for trial use and comment in 1973, including addenda 1 through 6, (see Sections 3.8.1.6.3 and 3.8.3.6.3 of the STP Final Safety Analysis Report).

3. If a work activity and contract is for a two-month period or less, an audit is not necessary when a facility preaward audit has been conducted.

TABLE 3

STP QUALITY ASSURANCE PROCEDURES

Procedure Number	Title	10CFR50, App. B Criteria
QAP-1.1	QA Organization	I
QAP-2.1	QA Personnel Development	II
QAP-2.2	QA Training	II
QAP-2.3	Site QA Personnel Examination and Certification	II
QAP-2.4	Audit Personnel Certification	II, XVIII
QAP-2.5	Vendor Surveillance Personnel Examination and Certification	II, VII
QAP-3.1	Engineering Quality Assurance	III
QAP-3.2	Field Design Changes	III
QAP-4.2	Houston Purchasing Activities	IV
QAP-4.3	Field Purchasing Activities	IV
QAP-5.1	Subcontract Quality Control Services	IV, VII
QAP-5.3	Surveillance of Pittsburgh Testing Laboratory	VII
QAP-5.4	Structural Integrity Test	VII
QAP-5.5	Mechanical Subcontract Surveillance Activities	VII
QAP-5.6	Post-Tensioning	VII
QAP-5.11	Site Geotechnical Surveillance	VII
QAP-6.1	Procedure Development	V, VI
QAP-6.2	QA Manuals, Procedures and Instructions Control	V, VI

STP QUALITY ASSURANCE PROCEDURES
(Continued)

Procedure Number	Title	10CFR50, App. B Criteria
QAP-6.3	QA Forms Control	VI
QAP-6.4	QA Document Review	V, VI
QAP-7.1	Vendor Surveillance Organization	I, VII
QAP-7.2	Vendor Surveillance and Houston Coordination Activities	VII
QAP-10.1	Inprocess Inspection and As-Built Verification Planning	X
QAP-15.1	Nonconformance Control	XV
QAP-15.2	Stop Work	II, XV
QAP-15.3	Potentially Reportable Deficiencies	XV
QAP-15.4	Trend Analysis	XV
QAP-15.5	Field Inspection Reports	X, XV
QAP-16.1	Corrective Action Requests	XVI
QAP-17.1	Records Control	XVII
QAP-18.1	Audit Program	XVIII
QAP-18.2	Site Surveillance	XVIII
NDEP-1.1	NDE Procedure and Instruction Qualification	IX
NDEP-2.1	Radiographic Examination	IX
NDEP-3.1	Visual Examination	IX

STP QUALITY ASSURANCE PROCEDURES
(Continued)

Procedure Number	Title	10CFR50, App. B Criteria
NDEP-4.1	Liquid Penetrant Examination	IX
NDEP-5.1	Magnetic Particle Examination	IX
NDEP-6.1	Ultrasonic Examination	IX
NDEP-7.2	Gas and Bubble Formation Leak Testing	IX

STP ENGINEERING PROCEDURES

Procedure Number	Title	10CFR50, App. B Criteria
GR-001	STP Engineering Procedures Manual	V, VI
GR-002	Project Organization	I
GR-003	Design Quality Program	II
GR-004	Certification of ASME Documents	III
DC-001	Preparation and Control of Project Procedures	V
DC-002	Drawing Control	III, V
DC-004	Foreign Document Processing	III, VI
DC-005	Preparation and Control of Engineering Specifications	III, IV, VII
DC-007	Preparation and Control of System Design Descriptions	III
DC-008	Calculations	III
DC-009	File and File Storage	XVII
DC-010	Codification	III, VIII, XVII
DC-011	Document Distribution	VI
DC-012	SAR Change Control	III
DC-013	Change Notice Control	III
DC-014	Document Review Comment Process	III
DC-015	Design Verification	III
DC-016	ALARA Review	III
DC-017	Computer Program Documentation	III
DC-019	Technical Reference Control	III
DC-020	Records Turnover	III, VI, XVII
DC-021	Engineering Design Deficiencies	III, XV, XVI
DC-022	Nonconformance Reports	III, XV, XVI,

STP ENGINEERING PROCEDURES
(Continued)

Procedure Number	Title	10CFR50, App. B Criteria
DC-023	Field Change Requests	III
DC-024	Supplier Deviation Requests	III, IV, VII
DC-025	Studies and Reports	III
DC-027	Special Tasks	III
DC-028	Design Change Control	III
DC-029	Change Review Board	III
AD-002	Qualifying Suggested Bidders' Engineering Capability and Experience	IV, VII
AD-003	Preparation of Inquiry Packages for Engineered Equipment	IV, VII
AD-004	Bid Evaluation of Engineered Equipment	IV, VII
AD-007	Preparation of Material Requisitions	IV,VII
PM-006	Personnel Indoctrination and Training	II
PM-008	Computer Program Use	III

TABLE 5

STP MATERIALS MANAGEMENT PROCEDURES

Procedure Number	Title	10CFR50, App. B Criteria
MM-HMC-01	Houston Material Control	IV, VII
MM-SP-03	Site Purchasing	IV
MM-SW-08	Site Warehouse	VII, XIII
MM-SMC-20	Site Material Control	IV, VII
PP-005	Engineered Equipment Procurement	IV
PP-006	Bulk Material Purchasing	IV
PP-007	Engineered Equipment Change Orders	IV
PP-008	Bulk Material Change Orders	IV
PP-021	Engineered Subcontracts	IV
PP-022	Field Subcontracts	IV
PP-023	Engineered Subcontract Purchasing	IV
PP-024	Field Subcontract Purchasing	IV
PP-025	Engineered Subcontract Change Orders	IV
PP-026	Field Subcontract Change Orders	IV
GCP-6	Field Sponsored Subcontracts (Under $100,000)	IV
GCP-9	Bid Comparison, Recommendation and Draft of Field Subcontracts	IV
GCP-23	Field Sponsored Subcontracts (Over $100,000)	IV
GCP-25	Field Sponsored Subcontract Change Order	IV
GCP-27	Bidder Evaluation	IV
GCP-28	Preparation of Field Requisitions	IV

TABLE 6

STP CONSTRUCTION PROCEDURES

Procedure Number	Title	10CFR50, App. B Criteria
CCP-1	Construction Surveys	X
CCP-2	Structural Backfill	X
CCP-9	ECW Pond Embankment Earthwork	X
CCP-10	Rigging	X
CCP-14	Vibroflotation	X
CCP-15	Fabrication of Miscellaneous and Structural Steel	X
CCP-20	ECW Pipe Excavation and Backfill	X
CCP-21	ECW Pond Concrete Paving for Erosion Protection	X
CCP-22	ECP Soil Cement Erosion Protection	X
CCP-23	Installation of Safety-Related Concrete Bolts	X
CCP-25	Quality/Construction Concrete Procedure	X
CPP-1	Qualification of Coating Application Personnel-Service Level I Steel	II, IX
CPP-2	Coating Service Level I Steel	IX
CPP-5	Coating Service Level II Steel and Concrete	IX
CPP-6	Coating Service Level I Concrete	IX
DCP-1	Document Control Centers General Procedure	V, VI
ECP-2	Meggering	X
ECP-6	Electrical Installations	X
ECP-9	Cable/Raceway Installation and Documentation	X
GCP-1	Preparation and Control of Quality/Construction Procedures	V

TABLE 6
STP CONSTRUCTION PROCEDURES
(Continued)

Procedure Number	Title	10CFR50, App. B Criteria
GCP-4	Housekeeping	II
GCP-13	Indoctrination & Training	II
GCP-21	Field Change Request	III
GCP-22	Receiving and Receving Inspection	VII, XIII
GCP-30	Turnovers	XI, XIV, XVII,
GCP-32	Temporary Waiver Request	XV
GCP-34	Permanent Item Transfer	VIII
GCP-35	Storage and Maintenance	XIII
GCP-36	Field Change Notice	III
GOP-15	Field Work Authorization	X
GOP-16	Clearance Control	XI, XIV
GOP-17	Boundary Tags	XI, XIV
GOP-23	Control of Field Sketches	V
GOP-24	Processing Foreign Documents	VI
GOP-34	Document Subdistribution Control	VI
ICP-1	Receiving, Functional Check, Storage and Handling of Instrumentation	XIII, XIV
ICP-2	Calibration of Electronic Distance Meters	XII
ICP-3	General Calibration Procedure	XII
ICP-5	Fabrication and Installation of Instruments and Instrument Sensing Lines	X
MCP-1	Trenching and Backfill	X
MCP-2	Fabrication and Installation of Safety Related Piping Systems	X

STP CONSTRUCTION PROCEDURES
(Continued)

Procedure Number	Title	10CFR50, App. B Criteria
MCP-3	Safety-Related Mechanical Equipment Installation	X
MCP-5	Handling and Tagging of Piping Valves	VIII, X, XIII
MCP-6	Pressure Testing for Piping Subsystems and/or Components	X, XI
MCP-7	Field Fabrication and Installation of Pipe Hangers and Supplementary Steel Supports	X
MCP-9	Bolt Torquing for Mechanical Equipment and Piping	X
MCP-10	Setting the Reactor Vessel	X
MCP-13	Mechanical Fabrication and Installation	X
MOP-3	Review and Documentation of Isometric Drawings and Support Drawings	V
MOP-4	Drafting and Processing Piping Isometrics	V
MOP-6	Traveler Package	V
MECP-1	Qualification of Welders and Welding Operators	II, IX
MECP-2	Field Fabrication and Erection of Structural Steel	IX
MECP-4	Field Fabrication and Welding of Piping Systems and Components - Nuclear	IX
MECP-5	Post Weld Heat Treatment	IX
MECP-8	Control of Welding Material	IX
MECP-9	Field Welding and Inspection of Instrument lines	IX

STP CONSTRUCTION PROCEDURES
(Continued)

Procedure Number	Title	10CFR50, App. B Criteria
MECP-12	Stud Welding	IX
WECP-2	Oxygen Indicators	IX
WECP-4	Field Welding of Aluminum Bronze Pipe	IX
WECP-5	Instructions for Weld Documentation	IX
WES-001	Materials Engineering Specification	IX
WES-11	Electronic Alignment, Performance Verification, and Maintenance of Automatic Welding Systems	IX
WES-12	Main Coolant Loop Pipe Welding	IX
WES-13	Insurance and Control of Purge Dams	IX
WES-14	Procedure for Requesting NDE	IX

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FIGURE 1 —— CORPORATE ORGANIZATION

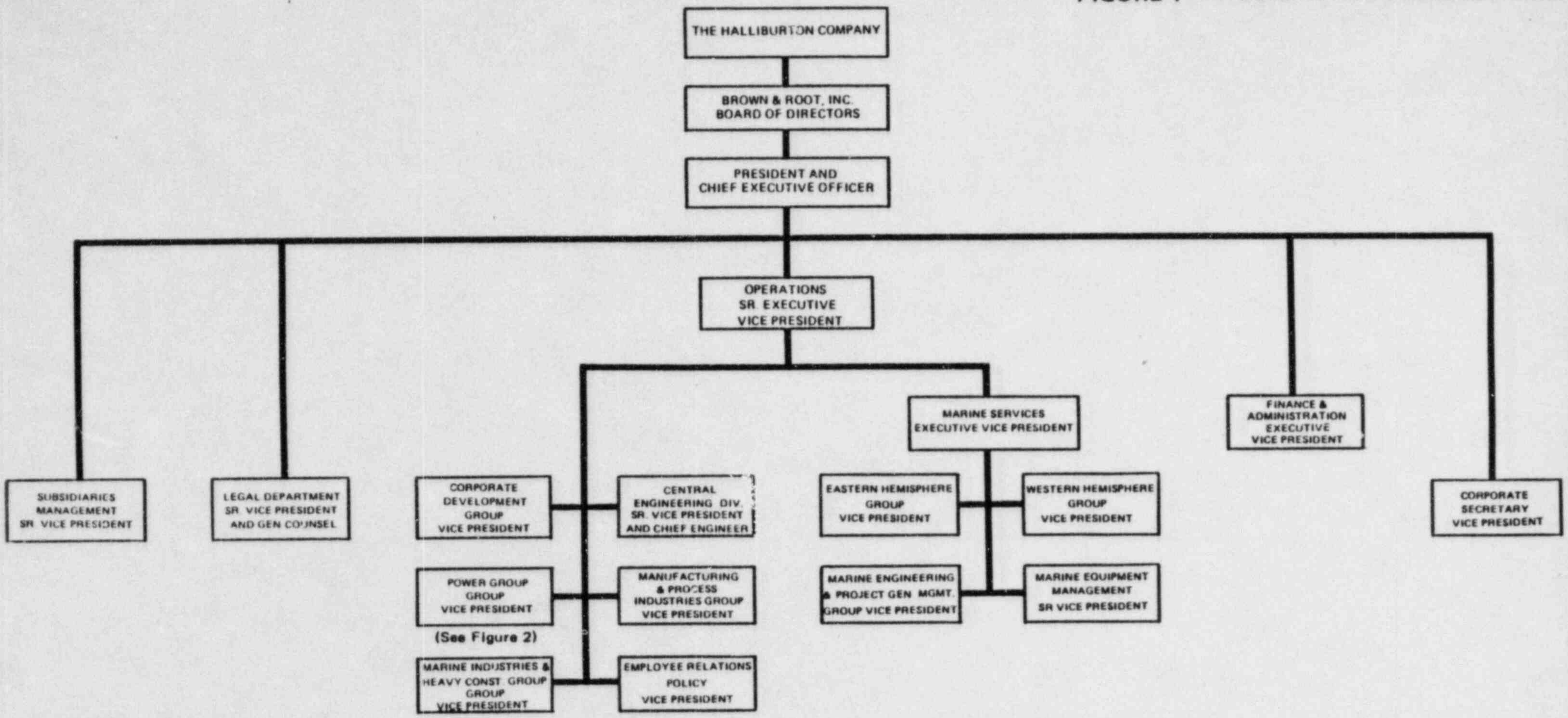

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FIGURE 2 —— POWER GROUP ORGANIZATION

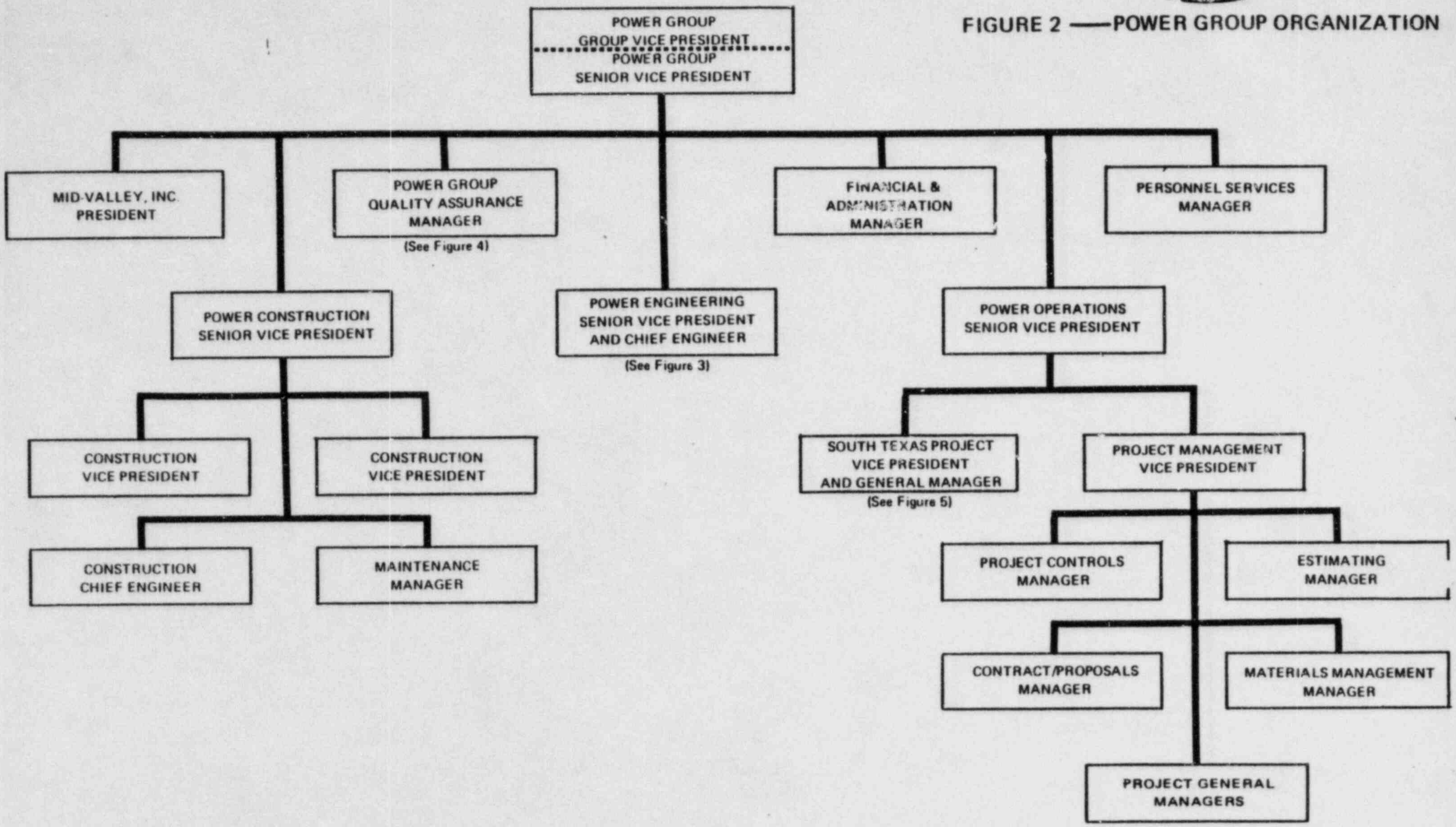

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FIGURE 3 — POWER ENGINEERING ORGANIZATION

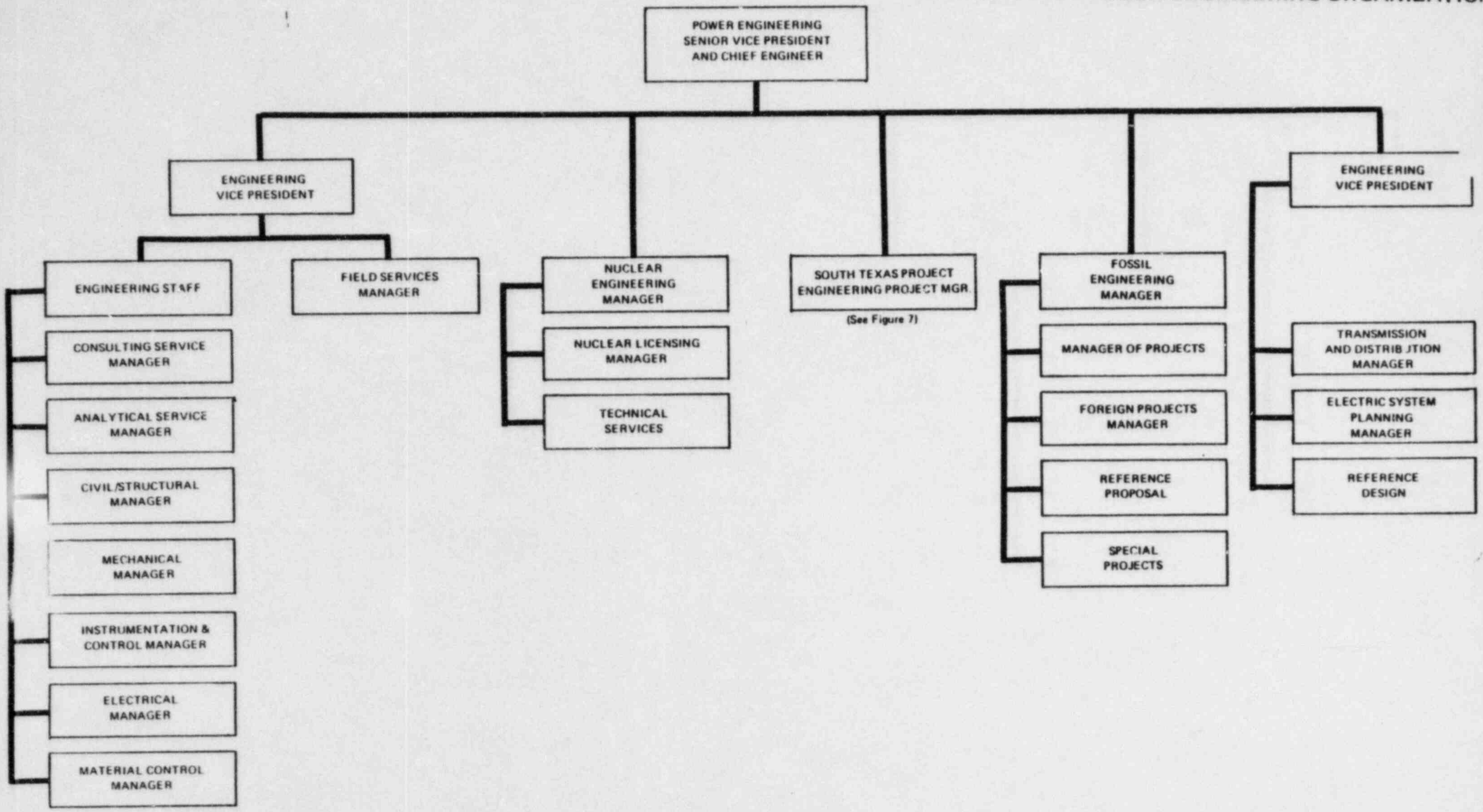

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FIGURE 4 — POWER GROUP
QUALITY ASSURANCE ORGANIZATION

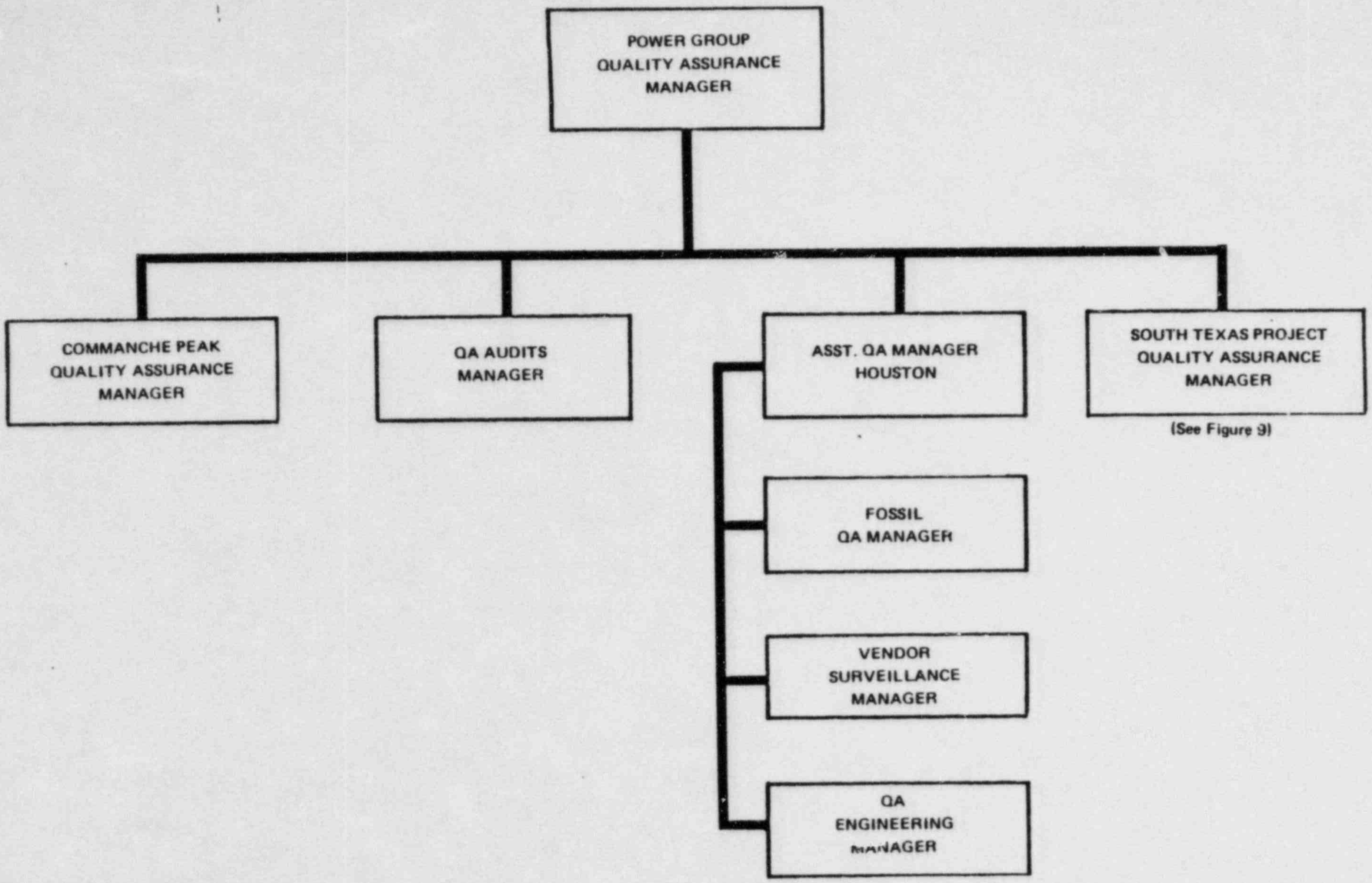

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FIGURE 5 ——SOUTH TEXAS PROJECT ORGANIZATION

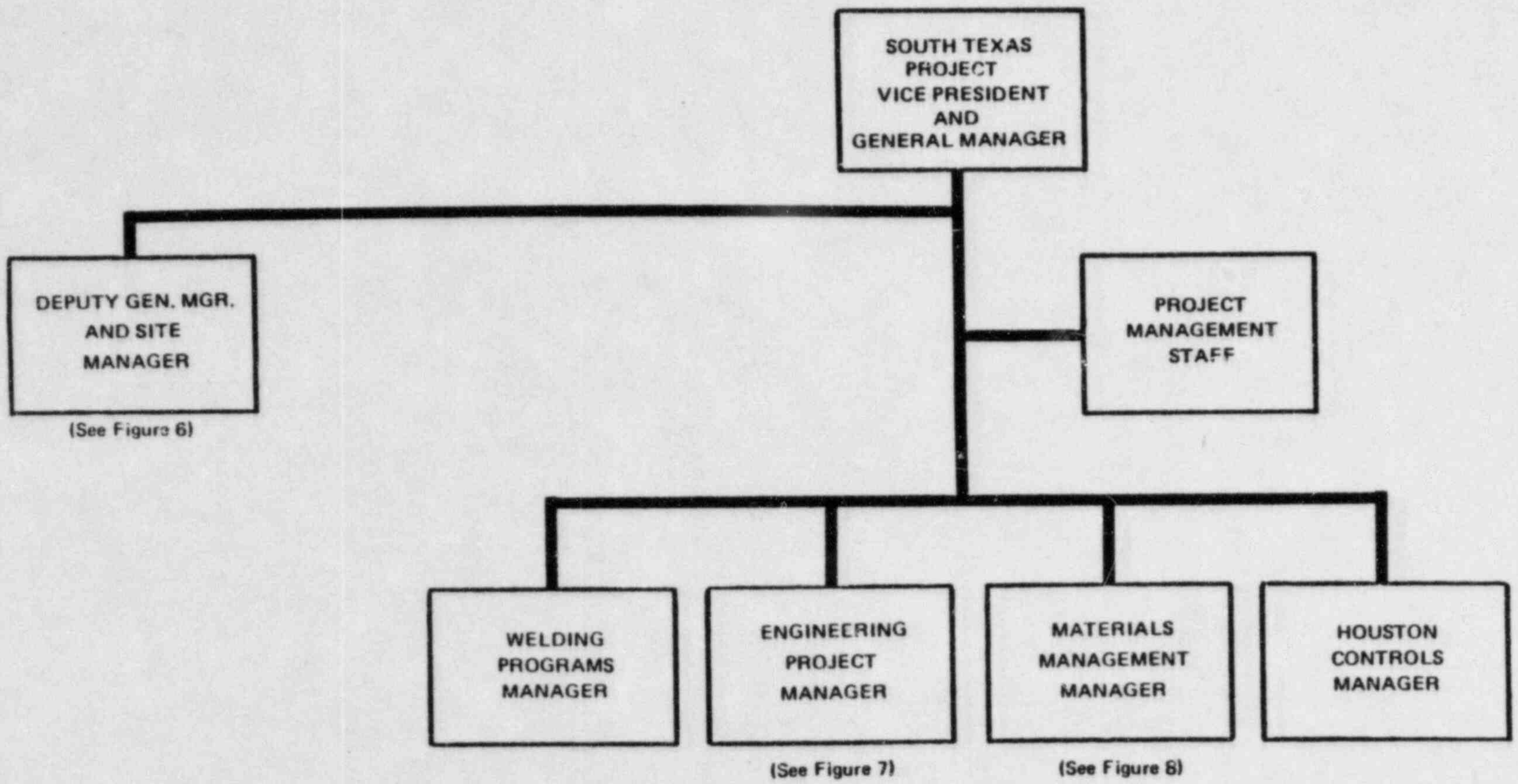

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FIGURE 6 — SOUTH TEXAS PROJECT SITE ORGANIZATION

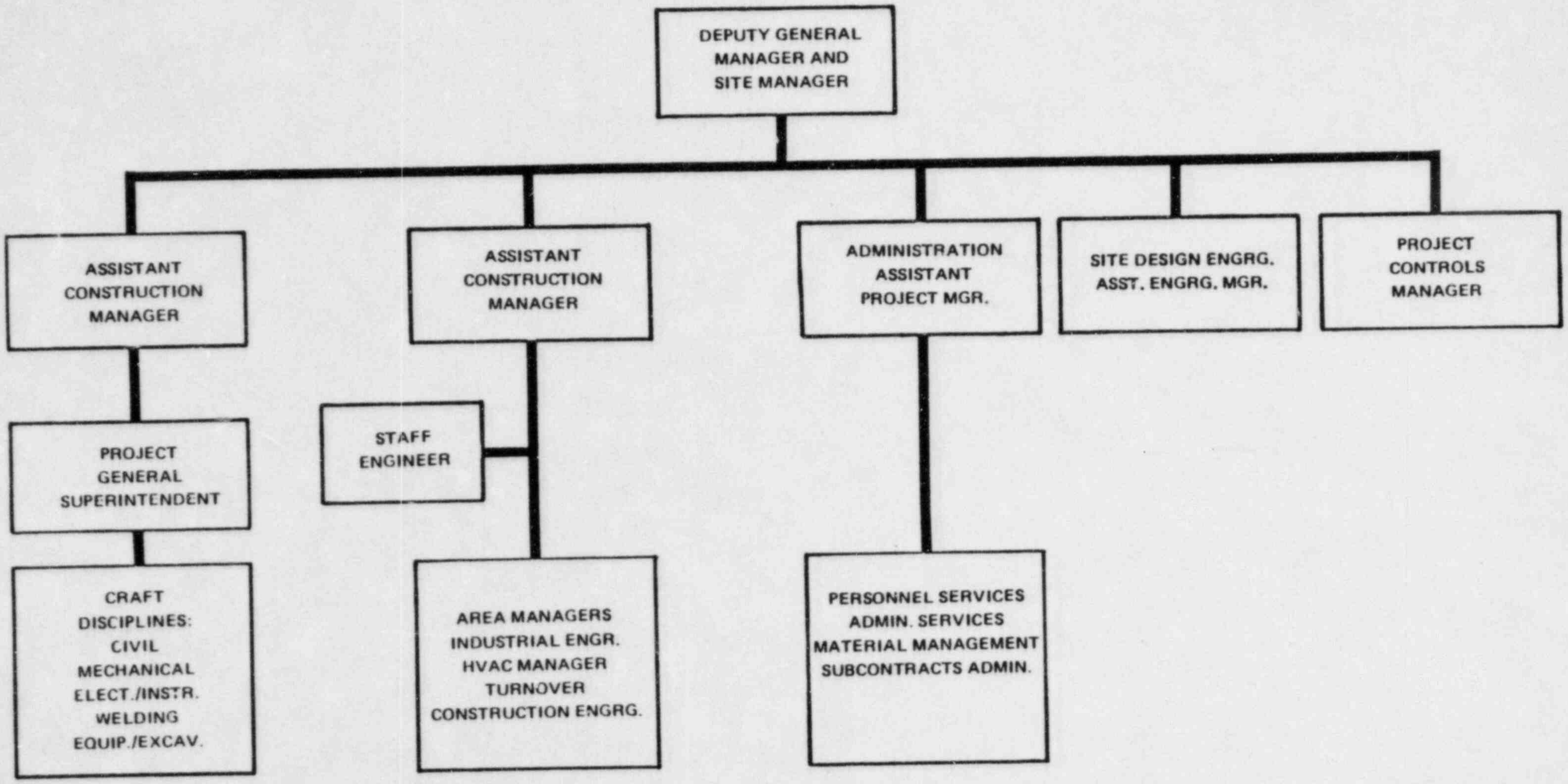

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FIGURE 7 — SOUTH TEXAS PROJECT ENGINEERING ORGANIZATION

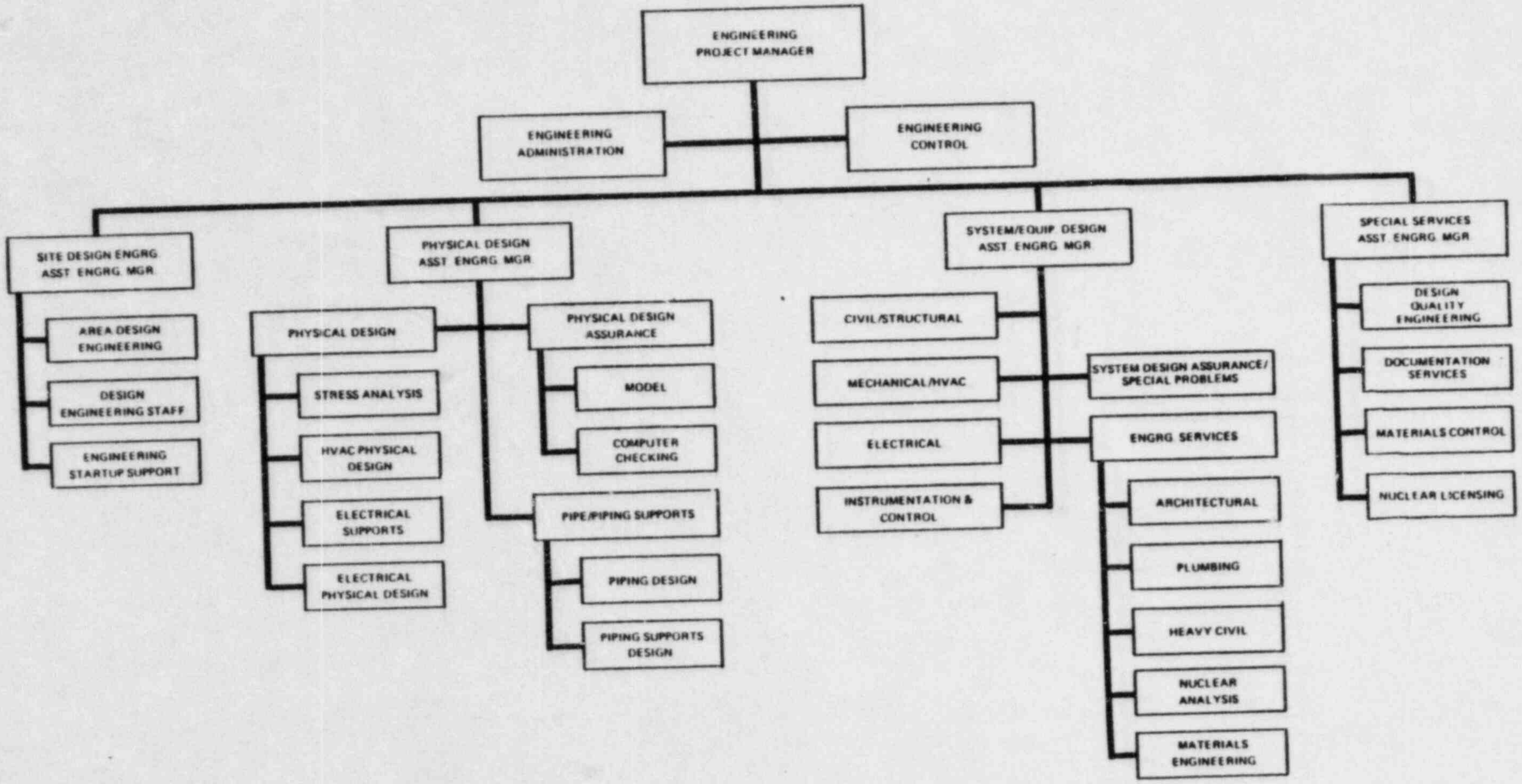

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FIGURE 8 — SOUTH TEXAS PROJECT
MATERIALS MANAGEMENT ORGANIZATION

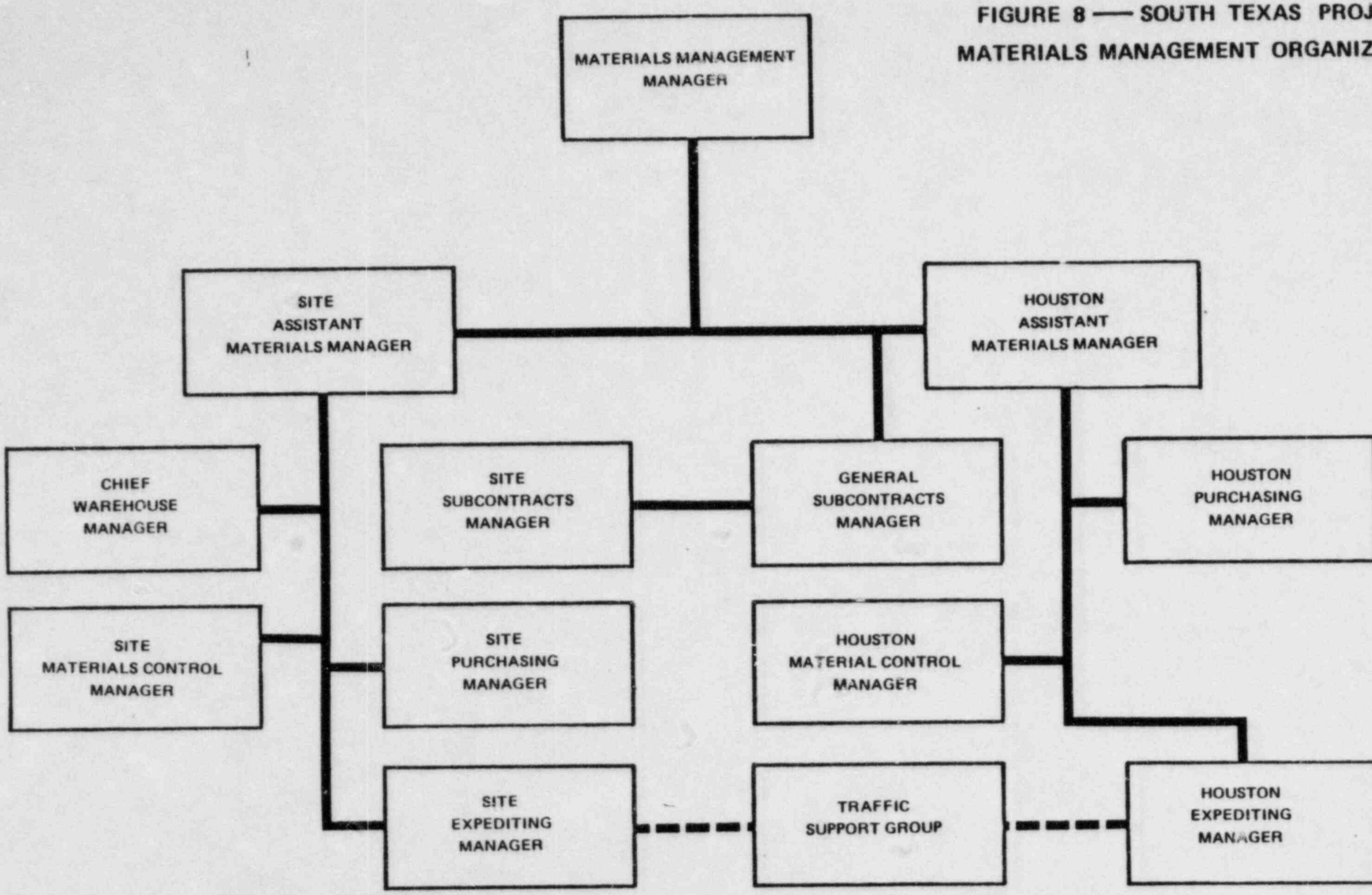

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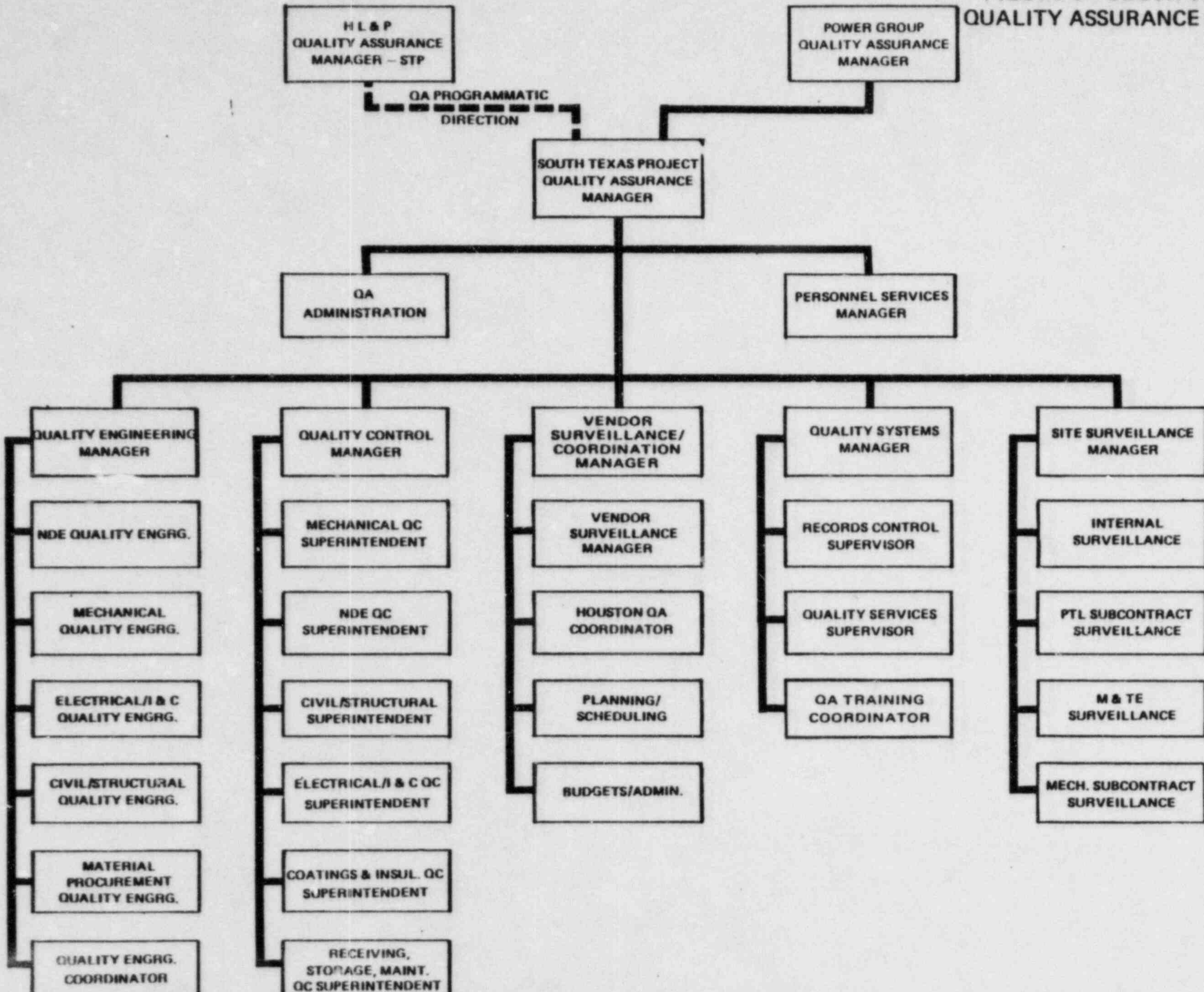
FIGURE 9 – SOUTH TEXAS PROJECT QUALITY ASSURANCE ORGANIZATION



ATTACHMENT 2

RESPONSES TO NRC QUESTIONS ON
STP QUALITY ASSURANCE PROGRAM DESCRIPTION

Q-1a) Submit into the docket of the South Texas Project (STP) Houston Lighting & Power (HL&P) and Brown & Root's (B&R) improved QA program controls discussed in the HL&P July 18, 1980 response to the Order to Show Cause dated April 30, 1980 and at the open public meeting August 19, 1980 as a revision to the QA program description presented in Chapter 17 of the STP Preliminary Safety Analysis Report. Your response should clearly indicate that the previously docketed QA program description is superceded by the new submittal.

A-1a) Part A of Attachment 1 is the revised QA Program Description for Houston Lighting & Power and Part B of Attachment 1 is the revised Brown and Root Quality Assurance Program Description. These revised QA program descriptions supersede the previously docketed QA program descriptions presented in Chapter 17 of the STP PSAR.

Q-1b) Provide a commitment in your revised QA program description to notify NRC of changes to the docketed QA program description, for review and acceptance, prior to implementation except for organizational changes which are to be reported within 30 days after announcement. (Note-editorial changes or personnel reassignments of a non-substantive nature do not require NRC notification.)

A-1b) Refer to section 2.11 of the HL&P QA Program Description.

Q-2) Provide in your response to item 1 above the additional information requested below which was previously addressed at the public meeting of August 19, 1980.

Q-2a) Describe, both in descriptive form and through organizational charts HL&P and B&R organization structures relative to the STP with particular emphasis on the QA organizations and their interaction between HL&P and B&R personnel.

A-2a) This information is presented in section 1.0 of the HL&P and B&R QA Program Descriptions.

Q-2b) As outlined in your response to the Order to Show Cause, dated July 28, 1980, the HL&P organization establishes Quality Assurance Supervisors in each of the major disciplines such as civil, structural, and electrical instrumentation. How will each of these HL&P Supervisors provide programmatic direction to B&R on matters related to his discipline? Is it planned to have a direct interface with B&R Quality Engineering of the same discipline?

A-2b) The Quality Assurance Supervisors have a direct interface with B&R Quality Engineering of the same discipline. They provide programmatic direction to Brown & Root through implementation review (as defined in the introduction to the HL&P Quality Assurance Program Description), reviewing and approving procedures applicable to the respective discipline, and indentifying and resolving deficiencies. This activity involves a virtually continuous interface between the HL&P QA Supervisors and B&R Quality Engineering.

Q-2c) Describe the extent to which QA individuals in HL&P and B&R participate in design and construction daily staff meetings to (a) keep abreast of daily work assignments, (b) assure adequate QA attention and controls are applied to quality affecting activities, and (c) assure adequate QA/QC staffing is available to accommodate daily work assignments and assist in resolving problem areas.

A-2c) Quality Control Superintendents and/or Inspectors attend weekly planning and scheduling meetings, in addition to other planning meetings, for their respective disciplines. During these meetings work schedules are confirmed, permitting Quality Control to assign the required number of qualified personnel to ensure adequate attention and controls are applied to activities affecting quality. An example of these meetings is the preplacement and post-placement meetings held in association with safety-related concrete placements.

Brown & Root Quality Engineering meets with design and construction staff personnel at periodically scheduled meetings to determine quality requirements for scheduled activities and to assist in the resolution of problems. Additionally, Quality Engineering interfaces with HL&P QA and B&R design and construction personnel to assure adequate attention to activities affecting quality.

HL&P Discipline QA and Quality Systems personnel monitor B&R Construction and published meeting schedules to plan HL&P QA/QC participation.

Q-2d) Describe your QA program for transferring responsiblities and control of quality-related activities from the principal contractors to HL&P during the phase out of design and construction activities.

A-2d) HL&P and Brown & Root Project Quality Assurance are in the process of establishing and documenting a program for transferring responsibilities and controls for quality-related activities from B&R to HL&P during phaseout of design/construction and during preoperational testing and plant turnover. This program will be implemented prior to preoperational testing. Refer to section 2.10 of the revised HL&P QA Program.

Q-2e) In your response to the Order to Show Cause, you state that HL&P is attempting to improve the attitude of the QA/QC personnel through insistence on adherence to procedures, emphasis on the independence of the QA/QC function, and improved supervisory support for the QC inspectors. Describe in greater detail how the development and maintenance of the proper QA/QC attitude will be monitored. What management steps are contemplated should departure in expected performance be identified?

A-2e) Brown & Root Construction/Quality Assurance holds periodic meetings in which Construction and Quality Assurance personnel express their concerns. These meetings are chaired jointly by the Project QA Manager and the Construction General Superintendent. There have been two such meetings and more will be scheduled as required. From these meetings, management has a better understanding of the real problems and can take measures for correction. The B&R Quality Assurance Management Review Board, which meets periodically with HL&P management participation, reviews Quality Assurance activities, including attitudinal and other matters, and provides management direction in the implementation of the Quality Assurance program.

If disagreements arise in the field between QC and Construction personnel, they will be elevated to the next level of management for resolution. This method of problem solving has been delineated to the B&R Quality Assurance and Construction personnel as described in the "South Texas Project Quality Assurance Program" provided as Exhibit 19 to HL&P Response to the Order to Show Cause (July 28, 1980).

HL&P is monitoring the development and maintenance of QA/QC attitudes by reviewing the training programs, talking to QA/QC personnel to keep abreast of their current attitudes and performing implementation reviews to evaluate their effectiveness. HL&P management is in close contact with B&R management to prevent poor QA/QC attitudes. However, should departure from expected performance occur, HL&P management will take action based on the specific cause of that departure by such measures as requiring changes in structure, personnel or training programs.

Q-2f) Provide a matrix of recommendations proposed by Bechtel and MAC and HL&P's evaluation of each recommendation. In those cases where the recommendations were not accepted, the basis for the rejection should be described.

A-2f) See attached copy of letter ST-HL-AE-548.

Q-2g) (1) Describe the extent HL&P will implement Bechtel's recommendations relative to (a) competitive salary ranges for QAEs and (b) ratios of staffing levels for QAEs and QCEs both at HL&P and B&R.

(2) Provide a comparision of new staffing and qualification plans for HL&P and B&R relative to the prior situation and describe your criteria for determining when supplementary personnel from MAC are no longer necessary.

A-2g) (1)(a) Management Analysis Company is preparing a report which will present recommendations to HL&P regarding Quality Assurance activities. The recommendations will address job descriptions and titles, personnel qualifications and salary ranges.

(1)(b) HL&P projected staffing levels of Quality Assurance personnel will exceed the ratio suggested by the Bechtel review.

Brown & Root does not establish a ratio in their staffing for QAEs and QCEs. The policy has been "hire qualified people to perform the task in question". At the present time B&R has a staff located at the site of over 240 people which includes 23 Quality Engineers (QAEs) and 132 Inspectors (QCEs).

(2) As indicated in response to Show Cause, (p 1-18, Sec. D) approximately 25 full time professional personnel were in HL&P Project Quality Assurance as of the end of April, 1980. At that time the need for an additional twenty personnel was identified and recruiting these personnel began. Since then, a more refined assessment of staffing requirements has been made in light of changes to the QA program in response to the Show Cause Order. This staffing assessment was summarized in a submittal to NRC (letter ST-HL-AE-451, G.W. Oprea, Jr. to K. Seyfrit, dated 9/24/80, copy attached).

As permanent replacements are recruited and management is confident in their ability to properly perform their duties, MAC personnel will be phased out or shifted to other assignments. Consideration will be given to certifications, previous experience, observed ability to perform on the South Texas Project, and level of quality assurance activity required to support the project in the individuals assigned position.

The most significant change made to the B&R QA organization was in the Quality Engineering function for the project. The Brown & Root Quality Engineering staff previously was located in the Houston Offices and comprised of only 3 Quality Engineers supporting the South Texas Project. This group was moved to the site in June, 1980, and joined the 6 Quality Control Engineers at the site. This was supplemented with 5 Engineers from Management Analysis Company (MAC). The current Quality Engineering staff at the jobsite is 23. Brown & Root has instituted an aggressive recruiting program in order to replace the MAC personnel by the fall of 1981. MAC personnel will be released only when qualified personnel have been hired by Brown & Root and have become fully-functional in their job assignment.

Q-2h) Your response to the Order to Show Cause contains many commitments in a number of quality assurance and construction areas with completion of these commitments over a time span. Describe in detail your system to track and ensure completion of required commitments before recommending restart of work in a particular area.

A-2h) HL&P Management has produced a master list recording the status of actions to complete all commitments. These action items are coordinated with the NRC Resident Reactor Inspector on a daily basis. Each of these actions is assigned to an individual for completion by a particular due date. Priorities are assigned to meet NRC's schedule for review and close-out of the individual items. The Executive Vice-President and the Manager, Houston Operations, on a weekly basis, review the status of actions to assure completion of these commitments.

Q-2i) You state in the response to the Order to Show Cause that key HL&P personnel are being retrained in basic priniciples of quality assurance. Indicate whether this is intended to be a continuing program, also identify who is responsible for administering, controling, and evaluating this training.

A-2i) The Quality Assurance indoctrination program was administered to key individuals and will be applied to new personnel. The program is administered and controlled by the Houston Quality Assurance Manager in Houston and by the Supervisor, Quality Systems at the STP site. The effectiveness of this program is determined through the result of Quality Assurance audits. Refer to section 2.6 of the HL&P revised Quality Assurance Program Description.

Q-2j) (1) In regard to qualification of personnel, describe the criteria for determining when upgraded qualifications are achieved for personnel both within HL&P and B&R. Will proficiency tests be given to personnel performing activities affecting quality and acceptance criteria developed to determine when an individual is qualified? How and by whom are proficiency tests prepared? Will certificates of qualification clearly delineate the specific functions the individual is qualified to perform and will they include the criteria used to qualify the individual in each function?

(2) What has been done to verify that personnel, presently on the job, are fully qualified for their positions?

(3) What is being done to upgrade radiograph interpretations capability?

A-2j) (1) HL&P Discipline QA personnel are required to be certified to perform implementation reviews. This certification is an upgrading of the qualifications required in the past for performing surveillance in that proficiency examinations on general QA requirements, specific procedures and technical competence are required. The exams are prepared by Quality Systems personnel for precedural and general QA requirements and by Discipline QA Supervision for technical knowledge. Certifications state the qualification requirements and specific areas of certification such as civil, electrical and mechanical.

Brown & Root Quality Assurance personnel who desire to obtain additional certifications (upgrading) are required to have:

1. Sufficient education and work-time experience verified in writing;

2. Satisfied the required reading list;

3. Attended formal classroom training (as required by the discipline Quality Control Superintendent or Level III Quality Engineer).

4. Proficiency testing under the direction of the Level III Quality Engineer.

Under Brown & Root QA procedures persons may be initially certified (or upgraded) by demonstrating proficiency and by having the required education and work-time experience in accordance with ANSI N.45.2.6. NDE personnel will conform to the requirements of SNT-TC-1.A , 1975, which requires proficiency testing in all cases. Other personnel may certify (or upgrade) by formal classroom training and proficiency testing in cases where sufficient verified education and/or work-time experience is not present. Again these requirements conform to ANSI N.45.2.6.

Proficiency tests are prepared by the instructor under the direction of Level III Quality Engineering or by the Level III Quality Engineer himself. In all cases tests are reviewed and approved by the Level III Quality Engineer.

Specific functions are delineated in written Brown & Root procedures. Certification forms specify education level, classroom training, applicable work-time experience, and proficiency test scores.

(2) MAC, HL&P and B&R QA management have performed evaluations of each key supervisory position and where additional expertise is required it is being provided through additional training.

Qualification for present B&R QA personnel has been established by:

1. Written verification of Work-Time Experience and Education Level,

2. Training administered as required by the discipline superintendent and/or the Level III Quality Engineer, and

3. Proficiency testing.

(3) Radiographers are certified according to SNT-TC-1.A, 1975. They receive formal training in site procedures (required reading) and classroom training as required by the Discipline Superintendent and NDE Level III Quality Engineer.

Upgrading of skill is presently performed by participation in the refresher training program and the weekly training sessions held by the NDE Quality Control Superintendent. Additional training may be done at the request of the NDE Quality Control Superintendent and/or the NDE Level III Quality Engineer.

Q-2K) In regard to upgrading quality assurance actions, you state you are writing construction procedures in a format which makes them easier to implement and that already you have revised concrete and welding procedures.

(1) Will personnel who are to implement the revised procedures have input to the changes? (The lack of input into the June 1978 procedure revisions apparently caused concern among QC Inspectors).

(2) What are your plans with regard to training personnel on these procedures? (QC personnel were concerned when 1978 procedure revisions were hastily implemented without sufficient training).

A-2k) (1) See Section 5.1 of the B&R QA Program Description.

(2) See Section 2.2.3 of the B&R QA Program Description.

Q-2l) In your response to the Order to Show Cause, you state that inspectors initiate nonconformance reports as appropriate only during "planned inspections". Does this preclude an inspector from writing such reports in advance of planned inspection milestones, during surveillance inspections, or when proceeding through the plant? Describe your controls in this area in full detail.

A-2l) The revised B&R procedure for reporting nonconforming conditions applies to all Project activities involving the procurement, installation, construction, inspection, testing or operation of materials, parts, components and their associated design documents.

The procedure makes clear that each employee on the Project is responsible for bringing to the attention of Quality Assurance any questions regarding materials, items or processes which may not conform to specified requirements of design documents.

This procedure provides a system for the reporting of nonconformances at any time whether or not found during planned inspections.

Q-2m) In your response to the Order to Show Cause you state that following initiation of a nonconformance report, an inspector must obtain acknowledgement by signature of the Construction Foreman or General Foreman. State your procedures for covering inspector action when such acknowledgement is refused or cannot be obtained? Describe your controls in this area in full detail.

A-2m) Should QC be unable to obtain an acknowledgement signature on a nonconformance report (NCR) from the Construction Foreman or General Foreman, the Project QA Manager is informed, who, if necessary, will resolve the matter at a higher level. Regardless of receiving acknowledgement by Construction of an NCR, the NCR will be processed by Quality Assurance in accordance with procedures.

Q-2n) Describe the extent to which authorized individuals, within the HL&P and B&R engineering and QA organizations, responsible for determining acceptable dispositions and closeouts of nonconformances are preselected and identified on official documents and state whether the document is used in the nonconformance process.

A-2n) Dispositions of NCRs are provided by the Material Review Board. The Material Review Board (MRB) consists primarily of a Project Site Engineer (PSE), a Quality Engineer (QE) and representatives from Construction and Project General Management. The chairman of the MRB is the Quality Engineer. As applicable, the MRB may request attendance and/or inputs from the Authorized Nuclear Inspector (ANI), Purchasing, Material Control or Westinghouse NSSS representatives. The PSE and the QE are responsible for all final decisions in MRB matters, however, the concurrence of HL&P is required on all MRB dispositions prior to initiation of work.

The MRB is responsible for conducting meetings to review, disposition and approve all NCRs except those dispositioned "Rework" or "Standard Repair" by the Lead Inspector. Formal meetings are not required in all cases as long as the chairman obtains the approval of all applicable MRB members.

Acceptability of rework/repair of items is verified by reinspecting the item as originally inspected or by a method at least equal to the original inspection method. Verification for ASME Code items by the ANI is performed concurrently with B&R QA verification.

HL&P Discipline Quality Assurance concurrence is required on all Material Review Board dispositions.

Q-2o) In your response to the Order to Show Cause, you state that where appropriate hold tags or other work constraints will be applied. The term "where appropriate" does not provide us with a sufficient understanding of the degree to which nonconforming items will be segregated and tagged to control further processing or installation. Describe in full detail HL&P and B&R Controls in this area.

A-2o) In the Quality Assurance procedure for the control of nonconforming items, the term "where appropriate" is not used. Instead, the term "whenever practical" is used. Practicality is determined by the accessibility, numbers of items (i.e. bulk orders), etc. The B&R nonconformance procedure states that whenever practical, nonconformance items are identified with hold tags to prevent further processing until dispositioned by the Material Review Board. Nonconforming items are segregated, whenever practical, from those which are acceptable to prevent inadvertant use or installation. When physical segregation is not possible due to bulk, size or weight, hold tags and roping off the immediate area is an acceptable substitute for segregation. If physical conditions limit the application of hold tags a statement to that effect is entered in the 'Remarks' section of the nonconformance report.

Q-2p) Describe in full detail, your controls which will assure that corrective actions are completed in a reasonable time frame.

A-2p) Procedures have been developed and implemented by B&R which will assure that corrective actions are completed in a reasonable time frame. Quality Engineering assigns a "completion due date" to each Corrective Action Request (CAR). The CAR has specific time limits for taking responsive action and may "constrain" or "hold" work on specific tasks or by specific crews until resolved. Failure to respond satisfactorily within the specified time will result in a "Stop Work" order at the direction of the cognizant QE Supervisor. Corrective action is verified by QA/QC when notified by the action designee. Follow-up review and reverification is performed and documented by QA/QC within 30 days to assure the effectiveness of the corrective action. If ineffective, a Stop Work may be initiated at the discretion of the cognizant QE Supervisor.

Q-2q) For quality affecting activities, describe the criteria for determining (a) what inspections are to be performed, (b) the accuracy requirements of measuring and test equipment.

A-2q) Refer to section 2.10 of the B&R Quality Assurance Program Description.

Q-2r) Describe HL&P's and B&R's QA involvement in the documented evaluation of inspection and test results to assure they are complete and accurate.

A-2r) B&R QC documents inspection and test results. B&R Quality Engineering reviews final record packages to ensure that all inspection and test results are documented, complete and acceptable. Reviews of records of each activity are included in the implementation review performed by HL&P Discipline QA.

Q-2s) Describe who within HL&P and B&R is responsible for the calibration of measuring and test equipment including NDT devices and describe the QA orginization involvement in this area. Also state that person or persons qualification.

A-2s) The calibration of measuring and test equipment is performed by the B&R calibration facility. B&R Quality Assurance Site Surveillance is responsible for assuring that the system for the control of measuring and test equipment is implemented and in conformance to established procedures. Refer to section 12 of the B&R QA Program Description.

HL&P Discipline Quality Assurance performs implementation review of the B&R overall program to assure that B&R Construction and Quality Assurance Site Surveillance are maintaining proper control of measuring and test equipment (Refer to section 12 of the HL&P Quality Assurance Program Description). Qualification requirements for the personnel performing the calibration are:

<u>Calibration Facility Supervisor</u> - Graduate of a four year accredited engineering or science college or university with 2 years of experience in the field of instruments; high school graduate with four years of related experience in the field of instruments.

<u>Calibration Specialist</u> - Two years of accredited college, university or technical school and one year related experience in the field of instruments; high school graduate with two years of related experience in the field of instruments.

<u>Calibration Technican</u> - High school graduate or hold a high school equivalent certificate, read, write and communicate in English; two years experience in testing of calibrated tools or measuring and test equipment in power plants, heavy industrial or military facilities.

Each person is trained and certified as being qualified to perform the assigned work.

Q-2t) Describe your controls for documenting and maintaining as-built conditions on drawings and specifications. Describe the extent as-built drawings and specifications identify nonconformances dispositioned as "accept as is".

A-2t) Refer to the B&R Quality Assurance Program Description, Section 3.2.10.

Q-3) In your submittal of the revised QA program description, provide a means for locating your responses to the above specific requests.

A-3) Specific answers are provided above or answers are provided in the revised QA program descriptions and a reference is indicated.

The Light company Houston Lighting & Power P.O. Box 1700 Houston, Texas 77001 (713) 228-9211

September 24, 1980
ST-HL-AE-548
SFN: C-0510

Mr. Karl Seyfrit
Director, Region IV
Nuclear Regulatory Commission
611 Ryan Plaza Drive, Suite 1000
Arlington, Texas 76012

Dear Mr. Seyfrit:

South Texas Project
Units 1&2
Docket Nos. STN 50-498, STN 50-499
Response to Bechtel
Recommendations

As requested in the Public Meeting of August 19, 1980 and identified as H12 in our Commitment List submitted to you on September 18, 1980, this letter with its attachment represents Houston Lighting & Power Company's analysis and response to the Bechtel recommendations.

Should you have any questions please advise.

Very truly yours,

G. W. Oprea, Jr.
Executive Vice President

GWO/ngb
Attachment

8010140188

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SOUTH TEXAS PROJECT

RESPONSE TO BECHTEL RECOMMENDATIONS

I. Procedures

A. Recommendation: It is recommended that a task force from both HL&P and B&R be organized for the purpose of reviewing functional procedures.

Response: Joint effort by HL&P and B&R is underway to review and revise procedures. A complete rewrite of B&R QA and Construction procedures is ongoing to simplify the instructions, clarify the inspection requirements, and ensure compatibility with our commitments. The Construction procedures are reviewed by Design Engineering to ensure that design requirements will be satisfied.

The HL&P and B&R QA procedures are under revision to incorporate all the 79-19 program changes and organizational restructuring.

B. Recommendation: HL&P QA should coordinate and track the task force effort.

Response: HL&P QA is working closely with B&R and is tracking the results and progress of the procedure rewrites.

C. Recommendation: A matrix should then be structured to identify how requirements and commitments are met by functional procedures.

Response: The use of a matrix is under review. It would come into use after procedures have been revised.

D. Recommendation: Once the functional procedures are in place, a six-month hiatus should be imposed on further program development or revisions.

Response: We are pursuing stabilization of procedures through a course of making minimum changes to said procedures. Control of changes to procedures will be predicated on "the need to change".

II. Documentation and Analysis of Defects

Recommendation: It is recommended that HL&P and B&R management commit to prudent action for documenting trends of nonconformance and program deficiencies identified by audit results.

Response: A trend analysis program for nonconformance identified by audits and by quality control inspections has been established and is being implemented as described in our response to Show

Cause Item 6. (See pages 6-8 through 6-12 of the Show Cause response.)

III. Training and Qualification

A. Recommendation: A comprehensive program of quality orientation, indoctrination to requirements, and functional training to procedures is recommended for personnel performing quality-related activities and for personnel performing quality surveillance or verification functions.

Response: A program of quality orientation, indoctrination to requirements, and functional training to procedures is being established for personnel performing quality-related activities and for personnel performing quality surveillance or verification functions for both Brown & Root and Houston Lighting & Power Company.

B. Recommendation: It is recommended that quality orientation and indoctrination programs involve HL&P and B&R personnel at all levels, including management.

Response: The quality orientation and indoctrination program does involve Brown & Root and HL&P personnel at all levels, including management. It is noteworthy that the Brown & Root quality improvement program under the tutelage of Mr. Phil Crosby has been established and is being implemented.

C. Recommendation: Provisions should be made for follow-up or refresher training.

Response: Refresher training is being addressed as part of the training programs for both Brown & Root and Houston Lighting & Power Company.

D. Recommendation: It is further recommended that consideration be given to programs developed elsewhere in the industry.

Response: Training programs which have been developed outside the South Texas Project by others in the industry is being considered in the program for training of Houston Lighting & Power and Brown & Root personnel.

IV. System Controls

A. Recommendation: It is recommended that the STP QA program and its implementating procedures clearly identify responsibilities and reflect a closed-loop feedback concept that quality-related activities are initiated, performed, reviewed, and documented in the proper sequence.

Response: The closed-loop feedback concept is being incorporated into the STP QA program and procedure development effort. Careful planning for each construction activity by Construction and Quality Engineering will be an integral part to ensure that the proper sequence of construction, inspection, and reporting results is performed to clearly established criteria.

B. Recommendation: It is further recommended that system flow diagrams be used to depict the sequence of activities as an aid to conveying system concepts to personnel.

Response: We have begun the use of system flow diagrams for some system development areas.

V. Audit System

A. Recommendation: It is recommended that the B&R audit system incorporate distribution of audit reports to management at least two levels above the manager of the area audited.

Response: Effective September 8, 1980, the following upper management personnel are on distribution for all internal and site audit reports:

S. H. Grote, Senior Vice President
K. M. Broom, Senior Vice President
W. M. Rice, Group Vice President

B. Recommmendation: It is further recommended that the close-out of HL&P audit findings include verification of corrective action, including a reexamination of the area to determine current control.

Response: The audit procedure has been revised to reflect more positive control for the verification of corrective action, and follow-up audits have been incorporated into the audit schedule when required.

C. Recommendation: Greater attention should be given to the selection, training, and qualification of auditors and lead auditors for both HL&P and B&R.

HL&P response: Auditors are being selected based upon the technical requirements of the area being audited.

B&R response: Screening of applicants and greater attention to selection of audit personnel has been implemented. Highly qualified subcontract audit personnel have been added to B&R staff in order to supplement the organizational needs until additions to staff have been completed and qualified. New audit program indoctrination and training have been performed and are ongoing.

D. Recommendation: Emphasis should be placed on maintaining accurate qualification records.

HL&P response: Audit procedures have been revised to clarify how entries are to be made on the auditor qualification records. Additionally, the auditor qualification form is being revised to provide a comprehensive method of indicating auditor qualification levels.

B&R response: All personnel files were completely reviewed and updated as required to assure that substantiation of the basis for qualification is documented.

VI. Management Involvement

A. Recommendation: It is recommended that both HL&P and B&R management take immediate steps to demonstrate their commitment to quality performance and their unequivocal support of the STP QA program.

Response: Both Brown & Root and HL&P management have taken firm steps to demonstrate their commitment to quality performance and support of the QA program. Evidence of this is the establishment of the quality improvement programs within Brown & Root, the conduct of various meetings and seminars by Brown & Root management with various levels of management and supervision in the Brown & Root organization, including Mr. Rice's address to some 600 Brown & Root employees in which he stated unequivocally the support of the QA program. Additionally, Mr. Oprea's meetings with the project team and the performance of both managements in the public meeting demonstrated the support for the quality assurance program. Also, the additional time being spent by top management of both companies on the site interfacing with all levels of QA/QC personnel and construction personnel is evidence of their support for the quality assurance program. Brown & Root also has issued the text of Mr. Rice's address as a policy regarding the quality assurance program for the project.

B. Recommendation: It is further recommended that the QA organizations be revamped to overcome noted weaknesses.

Response: The organizations of both Brown & Root and Houston Lighting & Power Company for quality assurance have been revamped to overcome noted weaknesses.

C. Recommendation: The respective QA functions of HL&P and B&R should be examined to ensure independent yet complementary QA practices.

Response: The quality assurance functions of Houston Lighting & Power and Brown & Root have been examined together by both MAC and Bechtel, and the new organization and definition of the role of programmatic direction on the part of Houston Lighting & Power and programmatic implementation by Brown & Root have ensured independent but complementary QA practices. Implementation of this philosophy is ongoing.

The Light company Houston Lighting & Power P.O. Box 1700 Houston, Texas 77001 (713) 228-9211

September 24, 1980
ST-HL-AE-541
SFN: C-0510

Mr. Karl Seyfrit
Director, Region IV
Nuclear Regulatory Commission
611 Ryan Plaza Drive, Suite 1000
Arlington, Texas 76012

Dear Mr. Seyfrit:

South Texas Project
Units 1&2
Docket Nos. STN 50-498, STN 50-499
Criteria For Quality Assurance
Staffing Levels

As requested in the public meeting of August 19, 1980, and identified as H-15 in our commitment list submitted to you on September 18, 1980, this letter describes the criteria for establishing the staffing levels for Houston Lighting & Power Company's site Quality Assurance organization to support our quality assurance program at the South Texas Project. Personnel projections through the end of 1986, as shown on the attached functional organization chart and manloading curves, (attachment 1) were arrived at using the following approach.

For each functional section of the site organization, we identified the specific quality assurance activities (job duties and responsibilities) that individuals in that part of the organization are responsible for accomplishing. We determined for each of those activities the number of man-hours required to accomplish the job and used those man-hours, considering the schedular flow of project activities from the present through the end of the job, to calculate the number of personnel in each segment of the organization required to support the activities of that segment.

The attached graph depicts man-loading curves by discipline and resulting total requirements necessary to support the quality assurance program through 1986. We intend to add personnel to the organization according to the curves shown on the graph. The people added will be experienced personnel in order to maximize the effectiveness of the additions. Should anticipated requirements not materialize or change in time, we will accordingly adjust our need either up or down, depending on circumstances.

~~8101270857~~

Required experience levels will be established on an individual basis by the Project QA Supervisor and the Project QA Manager, with consideration given to the experience level that exists within the group. Each group will have a mixture of people with varying degrees of experience.

Our work papers establishing the numbers represented by each of the curves on attachment 1 is available for review should you desire to do so.

If you have any questions, please contact me.

Very truly yours,

G. W. Oprea, Jr.
Executive Vice President

GWO/pjb
Attachment

cc: D. G. Barker
Howard Pyle
H. R. Dean
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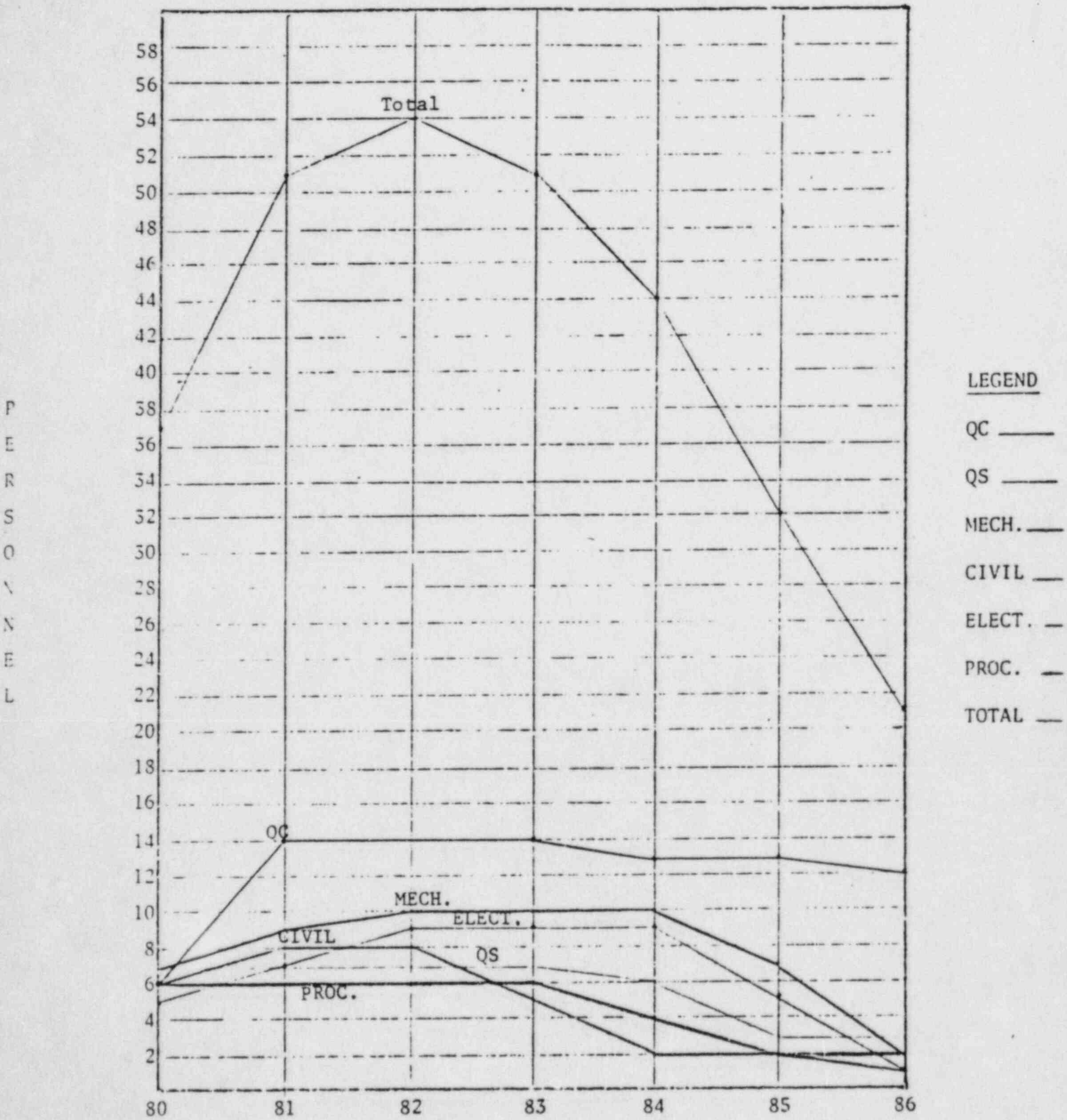
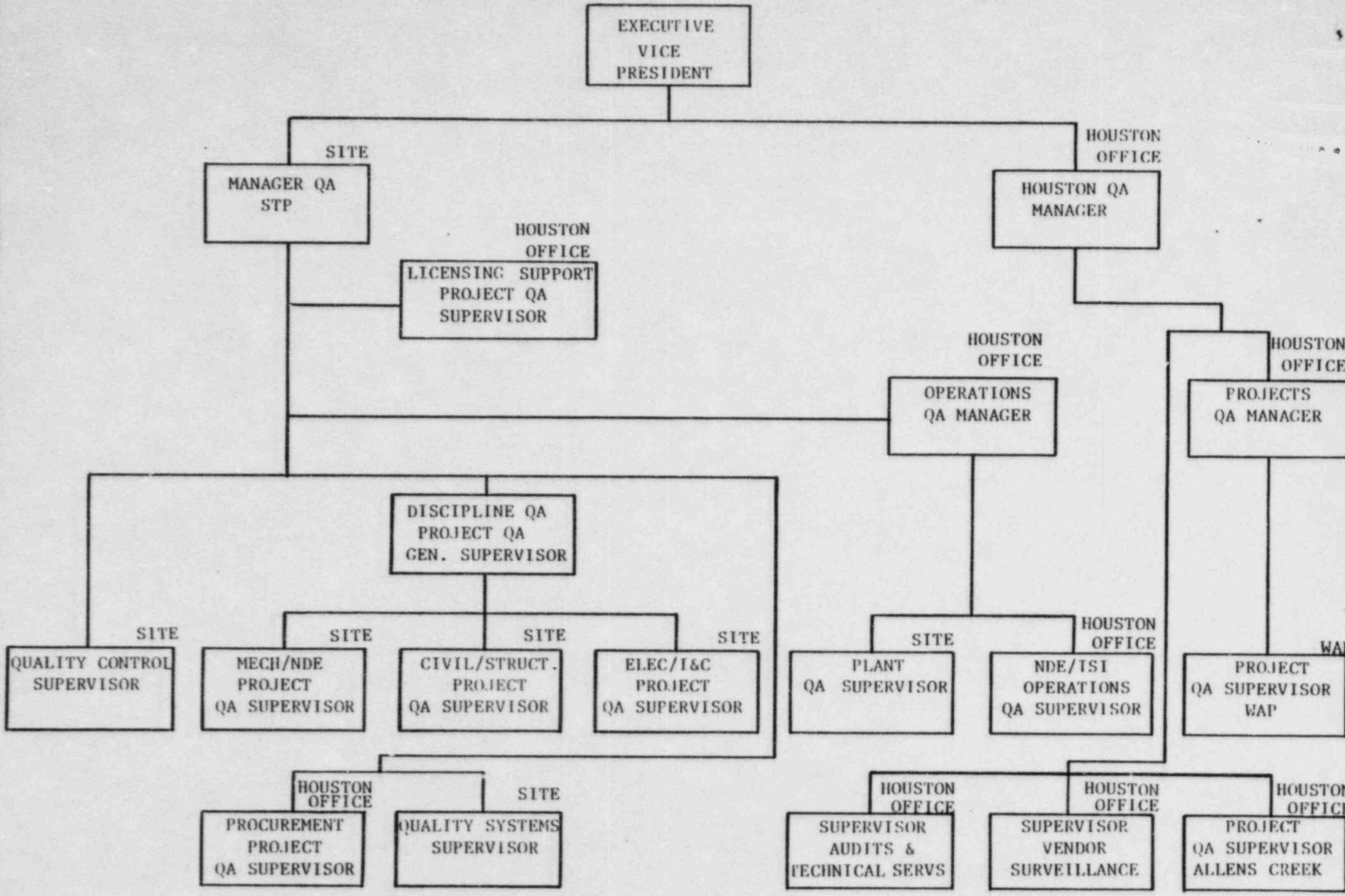


END OF YEAR

ATTACHMENT 1

HOUSTON LIGHTING & POWER
QUALITY ASSURANCE DEPARTMENT



ATTACHMENT 2