COPY

(CERTIFIED TAPE TRANSCRIPT)

NATIONAL PETROLEUM COUNCIL

x - x

MEETING

x - x

Wednesday,
December 15, 1999

Washington, D.C.

SHIRLEY JONES & ASSOCIATES, INC.
(301) 431-3900 & (202) 775-1842

AGENDA
Wednesday, December 15, 1999
Dolley Madison Ballroom
The Madison Hotel
Fifteenth and M Streets, NW
9:00 a.m.

I. Call to Order and Introductory Remarks.
Joe B. Foster, Chair, National Petroleum Council.

II. Memorial Resolution in Honor of Leon Hess.
Presented by Henry A. Rosenberg, Jr.

III. Memorial Resolution in Honor of Collis P. Chandler, Jr.
Presented by Cortlandt S. Dietler.

IV. Consideration of the Proposed Final Report of the NPC Committee on Natural Gas.
Peter I. Bijur, Chair, NPC Committee on Natural Gas.

V. Remarks of the Honorable T.J. Glauthier, Deputy Secretary of Energy.

VI. Progress Report of the NPC Committee on Refining.
Donald H. Daigle, Chair, Coordinating Subcommittee of the NPC on Critical Infrastructure Protection.

VII. Progress Report of the NPC Committee on Critical Infrastructure Protection.
Hon. Richard B. Cheney, Chair, NPC Committee on Critical Infrastructure Protection.

VIII. Reports of NPC Administrative Committees:

A. Finance Committee.
Kenneth L. Lay, Chair.

B. Nominating Committee.
Ray L. Hunt, Chair.

IX. Discussion of Any Other Business Properly Brought Before the National Petroleum Council.

X. Adjournment.

PANEL MEMBERS

Joe B. Foster, Chair, Natural Petroleum Council. Chairman and Chief Executive Officer, Newfield Exploration Company.

H. Leighton Steward, Vice Chair, NPC Committee on Natural Gas. Vice Chairman of the Board, Burlington Resources, Inc.

Peter I. Bijur, Chair, NPC Committee on Natural Gas. Chairman of the Board and Chief Executive Officer, Texaco Inc.

Hon. Robert W. Gee, Department of Energy.

Marshall W. Nichols, Executive Director, Natural Petroleum Council.

Hon. Richard B. Cheney, Chair, NPC Committee on Critical Infrastructure Protection. President and Chief Executive Officer, Halliburton Company.

Archie W. Dunham, Vice Chair, Natural Petroleum Council. Chairman, President and Chief Executive Officer, Conoco Inc.

Hon. T.J. Glauthier, Deputy Secretary of Energy, Department of Energy.

- oOo -

P-R-O-C-E-E-D-I-N-G-S

CHAIRMAN FOSTER: Welcome to the meeting of the National Petroleum Council, Wednesday, December 15, 1999, at the Madison Hotel, scheduled to start at 9:00 a.m. Let's get the meeting underway. My name is Joe Foster, Chairman of the National Petroleum Council. As is our custom, check-in was outside the door, and that'll serve as our official attendance record. If there's no objection, I'll dispense with the roll call for this meeting.

And let me introduce you now to the people sitting at this head table. On my right is -- far right is Leighton Steward, who's the Vice Chair of the Committee on Natural Gas. Next to him is the Chairman of that Committee, Peter Bijur, Texaco; and then Robert Gee from the Department of Energy. On the far left is Marshall Nichols, the Executive Director of the Council. Next to him is Dick Cheney, the Chairman of the Critical Infrastructure Study, which will be discussed a bit later on the

program. Archie Dunham, the Vice Chair of the Council. And then T.J. Glauthier of the DOE will be arriving a bit later, and he'll have some comments for us at that time. Secretary Richardson could not be here today.

If you have one of your agendas in front of you, we want to make a slight change in the agenda. The Memorial Resolutions which are mentioned there will be delayed until later in the program. John Hess has been delayed en route due to fog and will arrive a bit later. He wanted to be here for the Resolution pertaining to his father and we certainly want him to be here, so we'll do those two items a bit later in the meeting.

And the first item of business, then, is the presentation of the Report of the Committee on Natural Gas. These people have done a yeoman job about which much will be said later. Let me turn the podium over to Peter Bijur, the Chairman of that Committee, to make the introductory remarks.

MR. BIJUR: Joe, thank you very much. You'll have to pardon me. I've got a cold and my voice isn't doing too well, but just bear with me.

This is the culmination of a year's work, and a year of very tough work, trying to pull together a lot of disparate views within the industry. I think the team has done an outstanding job of putting together a piece of work that goes a long way to answering the questions about the future of natural gas in this country, but also poses a whole series of questions and issues for the future. And you'll see that as the presentation is made here this morning.

On behalf of myself and my Government Cochair, T.J. Glauthier, and the Cochairs for the project, Bill Wise and Leighton Steward, and the other members on the committee, I'm very pleased to have presented to you today the results of the 1999 study.

This study was initiated a year ago by

the then-Secretary of Energy, Federico Pena, and was subsequently endorsed by Bill Richardson in November of 1998. Our committee was asked to address the potential for natural gas through 2020 and beyond, particularly in light of the global climate issues and restructuring of the electricity industry. The study has identified both the opportunities and the issues associated with meeting a growing natural gas demand.

Our committee reviewed and approved the results of this study earlier this year in New Orleans, on November 8th. Today you will see the presentation that was made at that committee meeting, and will be asked to approve the report for submission to Secretary Richardson.

The study was accomplished through a subcommittee which was formed in the fall of last year. Since that time over 150 people from the industry and government have been directly or indirectly involved, and of course many, many more contributed. This effort was inclusive and was intensive, and, I might add, completed in

record time.

I'd like to take this opportunity to thank each of the study participants for their hard work. And I'd also like to thank the Council for the generous contribution of people and resources to make the study worthwhile.

At this time, I'm going to hand the meeting over to the Chair of the subcommittee, Rebecca Roberts. And the members of the subcommittee who, together making a team presentation, will give you the results of this study.

Becky?

MS. ROBERTS: Thank you, Peter. It is with great pleasure that our team is here today to present to you the results of the this study. As Peter mentioned, it's been a very collaborative effort. We've had many people that have put a lot of work into the study and we're proud to present the results to you today.

Before we get started, I have just one order of business. You have in front of you a

packet that contains the slides that we will be presenting today. Should be the most recent copy of the study in the packet, as well as an errata sheet that provides you with the changes that have been made since the November 16th addition. At the end of the errata sheet there are also a couple of changes that will be made, based on comments that we've received just in the last couple of days. So that will complete what we know so far, as far as the changes to the report, unless we have other comments today that would indicate additional changes.

May I ask if you're able to hear in the back all right? Okay, thank you very much.

Let me provide a little bit of background, if I may, on our approach to the study. As Peter mentioned, we had the committee that he chaired, the subcommittee that I chair with the Cochair, Bob Kripowicz from the Department of Energy. We also formed into three task groups to divide up the work.

The first task group was the Demand

Group, and that was headed by Matt Simmons and cochaired by Jim Kendell. The Supply Task Group was chaired by Tommy Nusz and cochaired by Guido De Horatiis. And the Transmission and Distribution Task Group was chaired by Sue Ortenstone and cochaired by Joan Heinkel.

Each of these groups involved many, many people from all segments of the industry in analyzing the results of the 1992 study, as well as making projections and assumptions that can be used in predicting what our outcome will be through 2010, 2015 and beyond.

I'd also like to point out that we used Energy and Environmental Analysis, Inc. That was Harry Vidas (ph.). This was the organization that provided the econometric model that was used in the 1992 study. We also used it in this study. It provided a good basis for comparison to get us started in this current study. And I'll talk just a little bit about that in a minute.

Before I leave the organization, I'd

also like to point out that we had a team that was called our Data Integration Team that has put enormous time and effort into completing this study, and I'd just like to recognize those guys. Most of them are here today. John Hull at Gilliard; Travis Stice, Blaise Poole, Harvey Harmon, Paul Kelly, Mark LeCroy (ph.), and Wayne Johnson. These people had dedicated almost full-time the last three months into getting this report written, and I appreciate it very much.

We began our analysis with assumptions that were incorporated into the model, the econometric model. This is a slide that just gives you an overview of just some very basic assumptions. But we did spend quite a bit of time putting current data into the model, building assumptions that you'll hear more about from each of the task groups.

We took a different approach from prior studies in that we did not build scenarios. We did build a reference case, and then we tested each of the major assumptions against that

reference case. This was done in order to let you, the reader of the report, make your own conclusions about where you think this business is headed and what the key issues are. So as you'll see later on, we will, for example, with GDP growth, in our reference case we used 2.5 percent. But then we tested it at 3 percent and at 2 percent, and this gave us some direction for some of the critical factors. And after we hear the presentations from the task group report, I'll provide a little more information on that. But what you'll see is a range of outcomes.

And we also in our analysis focused on the years 1999 through 2010. We have an extended view through 2015. This was a period at which we began to feel that our assumptions were to be tested a little bit more, a little less definite. But we still present this range of outcomes through 2015.

Beyond 2015, we have some comments about sustainability. We did not build into our analysis, our model, the data beyond 2015. So

you'll hear -- our report generally will provide information through 2010 and through 2015, and comments beyond that.

I'll turn the presentation over to our task group representatives. Our first one is Wayne Johnson, who's on the board of Simmons and Company, to present the demand key findings. Wayne is -- he calls himself the Old Gas Man. Wayne was the wisdom in our group and provided a lot of balance and history for us. It was very important in our analysis.

Wayne?

MR. JOHNSON: Thank you, Becky. You left out the word retired, which goes between Old and Gas.

(Laughter)

MR. JOHNSON: There are three key findings made by the Demand Committee as a result of our study. The very first one resulted from an examination of the 1992 study, and concluded that rapid growth had exceeded the expectations of the '92 study.

This slide shows on the bottom line the 1992 NPC low case. The low case was a very high conservation case that was put together at that time, and as you can see, it's far below the yellow line which represents actual, and it really missed the mark by a great distance.

The 1992 high case also missed the mark. There are two principal reasons for that. One, the economy grew somewhat faster than the NPC study had anticipated. Over the 1990 to 1999 period, GDP increased at a rate of 2.6 percent; the study assumed 2.4 percent. The other reason for the change and probably an even larger reason is that conservation, though it continued, continued at a slower rate than had been anticipated by the study. We are still improving our conservation in this country, and we're getting more output per BTU of input. But the rate of improvement and the slope has changed, and it changed about in 1991.

Our second finding is that demand will increase by 32 percent between 1998 and 2010.

This slide shows how the various market segments will grow over the period to 2010 and on, in the extended view, to 2015. And you will see that there is an improvement in all market segments. The largest increase is in industrial and in electricity generation.

This pie chart shows how the 7 PCF increase, which corresponds to a 32 percent increase in demand, breaks down. The largest segment, electricity generation, 47 percent. Industrial, 23; commercial, 11; and residential, 19.

It's well to discuss the demand assumptions -- as I've already pointed out, the failure of the 1992 study to anticipate demand growth to 1998 and 1999 was due to the assumptions. And certainly all of us who have worked on that study are aware of the frailty of assumptions, and undoubtedly we have made some assumptions that will turn out to be incorrect as well. But let's look at what we've assumed on the demand side.

We're assuming that GDP will grow at 2.5 percent per year. As I mentioned, the average from 1990 to 1998 has been 2.6 percent. In 1997 and 1998 we've had GDP growth of 3.9 percent. It appears that GDP growth in 1999 will be 4 percent or slightly higher. So, there is a possible error. However, we also have not had a recession since 1992. It was very hard for the committee to decide when we would have our next recession and how severe it would be.

So what we have done is settled on the figure of 2.5 percent per year, which would include possibly one or two recessions in the period to 2010.

We are also assuming that 140 gigawatts of new gas fuel power will come on line by 2015. I believe the 2010 figure is 113. That's a lot of gas power. I spent some time during my youth calling on electric utilities trying to get them to burn gas. Usually you could finish your coffee before you were thrown out, but not always. Now gas is the fuel of choice, and gas

marketers are welcome at any electric utility.

We are also assuming that 70 percent of the new gas fuel power projects will be fuel switchable. That is to say that during peak periods on a gas system, they will switch to low sulfur distillate. At the present time most plants are not equipped to do that. But our feeling is that they will correctly analyze the situation and decide that they need to have alternate fuel oil equipment. That will put a strain on the oil supply system. At peak month by 2015, switching 70 percent of the gas-fired projects equates to 3.5 million barrels a day of low sulfur distillate. So, fuel switchers are going to have to acquire storage facilities and they're going to have to enter into contracts that will allow them to take deliveries of such large quantities during the winter peak period.

We're also assuming that no new nuclear facilities will be built. I don't think anybody has challenged that assumption. We presently have in this country nearly 100 gigawatts of

nuclear capacity. Thirty gigawatts of that 100 will come up for relicensing during the study period. There has never been a nuclear plant relicensed in the United States. So there is no precedent for how such a proceeding would be conducted, what kind of evidence would be presented, and what kind of result might follow. So we have applied the rule of two, as I call it, and we have decided that 15 gigawatts of nuclear generation would retire and another 15 would get a license extension.

The difference of 15 gigawatts of nuclear power in terms of gas demand is approximately 800 BCF.

We are also assuming that coal capacity utilization will increase from the current 64 percent to 75 percent. I need to explain just a little bit about how coal capacity utilization is figured. Basically, if you had a single plant and it ran 365 days a year, 24 hours a day, at full load, that would be a 100 percent capacity utilization. So obviously, if it ran 75 percent

of the days or at 75 percent of load, that would be a 75 percent load factor. We're assuming that we will see an increase, and our brethren in the electric industry have made it clear to us that this will be a difficult task. But there will be incentives for owners of coal plants to burn coal when they can and to push up their utilization rate.

There are obviously two sides to this issue, and it is a very important one. If utilization were to remain at 65 percent instead of the projected 75 percent, it would add 1,700 B's to the gas demand in 2015.

Our third finding is that environmental regulations could add significant incremental demand. We based our study on environmental regulations as they currently exist, and we did not try to project what they might be at some point in the future. We are aware, of course, of the Kyoto Protocol, and of course there's a great deal of doubt as to just how the Kyoto Protocol would be implemented. We did not attempt to

study this issue, because it was not a currently applicable environmental regulation or law.

We were aware of two studies that have been conducted by other entities: one, the EIA has done a study showing that compliance would raise gas demand by 2 to 12 percent, depending on the scenario; and that EEI has done a study showing the gas demand would increase incrementally by 10 to 22 percent, again depending upon the scenario. And I guess our conclusion would be that future environmental regulations should be studied very carefully to measure their impact on gas demand.

And to talk about the challenges of meeting gas demand, I'll call on Travis Stice.

MR. STICE: Thank you, Wayne. Good morning, my name is Travis Stice, and I'm with Burlington Resources, and I've served as Assistant for the Chair for the Supply Task Group along with Ed Gilliard.

There are four key findings of the Supply Task Group, and I'll cover each finding

for the remainder of my talk.

The first key finding is the resource base is more than sufficient to provide an expected growth in U.S. demand well into the 21st century.

This slide depicts the total U.S. gas resource based, divided into the categories we used for our analysis. They categories are the same categories we used for the 1992 study. And these categories are: the proved resources, which is the most certain of the resource base categories and classically defined; old fields, which represent additional resources that represent growth in existing fields; we also have new fields, which are resources that are from, theoretically, conventional fields that are yet to be discovered; and then non-conventional, which are resources that require technologies different than conventional reservoirs, and includes things such as shales, coal bed methane, and tight gas reservoirs.

The total resource base is estimated at

1,466 TCF. Now, this represents an increase of 171 TCF over the assessment made during the 1992 study. Now if you account for the 124 TCF of production that occurred between 1992 and 1998, the current study resource base is 23 percent greater than the resource base estimated in the 1992 study. Now, this increase is largely due to technology breakthroughs that have opened up new frontiers such as deep water in the Gulf of Mexico, and have provided improved information and better tools for evaluating and more fully recovering these resources.

The proved reserve base has remained essentially flat at 157 TCF, despite the fact that over 124 TCF has been produced during the intervening periods. Now also, the reserve appreciation in old fields is larger than it was in 1992. Now, this increase in the old fields estimate reflects the industry's improved ability to identify and exploit opportunities in these older fields.

Now, the growth in new fields is from

the deep water resources. As a point of reference, the deep water resource was estimated at 57 TCF in the 1992 study, compared to currently 140 TCF that we have estimated in the '99 study. That translates to an increase of 145 percent.

Now, the only category that showed a decrease in the resource base is in the non-conventional resources. And this has primarily occurred in the San Juan Basin, the Blackwater Basin coals, the Antrum shale in Michigan, and the Appalachian Shale resource.

This segment analysis is of the U.S. gas supply by source. Notice that the U.S. demand of 29 TCF will be met primarily from domestic sources.

Now, if you look more closely at this segment starting at the bottom, called All Other Areas, it remains essentially flat. And you can see that the highest growth in production is from the ARK/LA/TEX, Rockies and the Gulf of Mexico region. Also, Canada continues to be an

important source of supply, and there's a small but growing contribution from LNG imports.

This is a chart similar to what Wayne showed during his presentation reflecting that 7 TCF growth in supply over the next decade. Almost half of the growth will come from two regions; the Rockies, and the Gulf of Mexico. Primarily, the deep water Gulf of Mexico. And I have a slide following that's going to elaborate in greater detail the deep water resource. For this analysis, the Rockies include the San Juan Basins, the foreland areas, the Williston, and the Overthrust regions.

The driving factor behind the growth in the Rockies is the non-conventional resources, primarily in the tight and the coal bed methane resources. The major coal bed methane basins are the Powder River, the Uinta (ph.), the Green River, and the Peonce (ph.) regions. In the ARK/LA/TEX region, similar to the Rockies, the growth and production is driven by continued evolution of tight gas and technology

development.

The one area that has the most potential to impact future supply during the next decade is the Gulf of Mexico region. This region represents roughly a third of the projected available supply in 2010. Production from the deep water is projected to increase from less than 1 TCF in 1999 to over 4.5 TCF a year by the year 2010. Now, the sheer size of this deep water wedge points out the significance of this resource base.

Also of interest is the decline in the shelf. This is an area of traditional, readily available supply, and currently accounts for more than 20 percent of U.S. production. This decline in production equates to about 2.5 or 3 percent a year, which translates to a one-third reduction in the current production levels by the year 2015.

There are three key observations that characterize the resource base and describe some of the technical challenges associated with

converting these resources to available supply needed to meet this projected demand.

In the onshore environment, production will come from deeper wells -- deeper wells mean greater than 10,000 feet -- which translates into complex issues which range from hotter, higher pressure environments, to complex well-bore geometries with corrosive hydrocarbon gases. It's important to note that the industry's ability to achieve this production from these greater depths is dependent upon the deep drilling infrastructure and the continued evolution of technology.

Also on shore, production will be from more non-conventional sources such as coal bed methane, shales, and tight resources, which will require also technological challenges for the industry. By 2010, almost 80 percent of the production in the foreland region will be from non-conventional resources, which is up from current levels of 45 percent.

As discussed in the preceding slide, a

significant portion of this supply will come from the deep water resource, with challenges which include many, but such as sub-sea completions with smaller, less expensive production systems.

The second key finding discusses the impact that restricting access will have on limiting the availability of supply. The most significant access restriction occurs in the Rockies. Within the Rockies, this 137 TCF represents 40 percent of the potential gas resource that's subject to Federal restrictions. An estimated 29 TCF for underlands categorized as no access and is completely off limits to the industry. These sensitive areas include some things like national parks and forest and wilderness areas, or where extreme stipulations limit access so restrictively, that practically eliminates drilling.

More importantly, an additional 30 to 35 percent, or 108 TCF of the resource base, is categorized as high cost and is encumbered by lease stipulations, which translate to increased

cost and delays to the producer. The average delay for the producer for dealing in these type areas with these stipulations is two years, and increases well cost of 6 percent.

Now, the remaining 55 or 60 percent, or 203 TCF, falls under standard leasing terms either from the Federal Government or others, but predominantly from the government, and as a practical matter, regardless of the lack of specific stipulations, these standard leasing terms on Federal acreage have regularly been interpreted very restrictively, also resulting in delays.

The remaining resources in the Gulf and Atlantic and Pacific coast waters representing 100 percent of the resource base that's subject to these restrictions.

There's four main assumptions regarding access. The first is that sale of 181 will go on as scheduled in 2001, which is the first sale in recent times in the eastern Gulf of Mexico. Even with this sale, over half of the eastern Gulf of

Mexico resources remain off limits.

Next, existing regulatory requirements and restrictions will be honored; and third, no new restrictions will be implemented. Existing monitory areas, the Atlantic and the Pacific offshore areas and eastern Gulf of Mexico outside the 181 area, will stay as currently mandated through 2012. The Task Group recognizes that this assumption of no new restrictions may be optimistic.

Now, due to the uncertainty of trying to predict these restrictions, we've maintained the status quo with the assumption that an interagency work group would efficiently administer any changes.

I'll let Sue Ortenstone discuss the final point concerning right-of-way infrastructure during her presentation.

The third key finding is, a healthy oil and gas industry is critical. Drivers for substantial growth and natural gas demand are presently in motion and are expected to increase

demand to levels previously unseen in the United States. Only a healthy producing sector can meet the challenge of satisfying that level of growth and demand.

The third main components that indicate a healthy industry. First, adequate financial performance occurs. The results of our analysis indicate that capital expenditures in excess of $650 in the United States and over $200 billion in Canada in today's dollars will be required of producers over the next 15 years. When you include the $700 billion for operating expense, the total expenditures approach $1.5 trillion to fund the industry through 2015. Now, this equates to an annual average increase in capital expenditures from $34 billion between 1990 and 1998, to $46 billion a year between 1999 and 2015, which is an increase of 35 percent. And also, many of these expenditures will require investment in much high-risk type projects.

Now, attracting this level of capital to the E&P sector will be a significant

challenge, especially given the disappointing returns earned by producers over the last decade.

Second, a healthy industry must have the available of skilled workers. The producing sector has endured three debilitating shocks to its employment ranks during the last 20 years: 1982, 1986, and again in 1998. Each of these shocks has resulted in huge layoffs, and perhaps more importantly, a hesitancy to hire personnel. Now, this has caused a disproportionate percentage of the work force reaching retirement age during the next decade. Furthermore, the next generation of workers is choosing to not enter into the industry, and that's indicated by the significant decrease in enrollment in energy-related curriculum that's been occurring since the mid-'80s. The oil field service sector also faces that same challenges, as many of its work force has left in search of more stable work.

The last component of a healthy upstream industry is this availability of drilling rigs. The U.S. drilling fleet must

expand to undertake the dramatic increase in activity that will be required over the next decade to produce this additional supply. The total number of wells, including dry holes, will have to double from 24,000 wells per year to almost 48,000 wells per year by 2015. This indicates a fleet of just over 2,100 available onshore rigs will be needed by 2015. As of January 1st, 1999, the available onshore rig fleet numbered just 1,700 rigs, down from over 3,500 rigs in 1985. And these numbers do include truck-mounted rigs. Over the next several years, less than 200 rigs will be needed to be built for a rig depths. But during the second half of the next decade, you can see that a significant ramp-up in construction will begin. In our calculations we're assuming an attrition rate of 5 percent a year. If this historical attrition rate were to continue, most of the 1,700 onshore rigs would be retired, and a total of almost 1,900 rigs would have to be built by 2015.

The last point is that the availability

of skilled workers to build and operate these rigs is a concern. The rig requirements for the offshore drilling fleet is shown in a similar fashion to the onshore drilling fleet. An estimated 72 additional offshore rigs will be needed to meet the projected increased activity in the Gulf of Mexico. Now, different from the onshore rigs, these additions may come from three sources: from reactivations; from relocations; and from new construction. While the total number of rigs may appear small, the cost per rig is substantially greater than those onshore. And again, very similar to the onshore drilling fleet, the availability of skilled workers remains a concern.

To close this discussion on rig fleet, the amount of expansion required during our forecast period should serve as an alarm, since the drilling sector and the manufacturers of drilling equipment are not currently positioned to undertake this level of expansion.

The last key finding is that

investment, research and development will be necessary to maintain the pace of technological advancement. Technology advancement has played a major role in the increase in North American resource base by improving drilling and operational efficiencies, by increasing recovery factors, and by improving the success rate. Developing technology will require a cooperative approach by all parties involved, from the producer who must apply these technologies to the investor who must at times sacrifice immediate gains for longer-term growth.

Now, technology in the future will deal more with how data is interpreted and integrated, along with a more collaborative approach in how this technology is developed between the service sectors and the producers.

These trends were in large part developed from a survey of major producers and selected large independents completed by the Technology Oversight Group of the Supply Task Group in June of this year. Now, the first trend

is, industry consortia for technology development have been cost-effective, most prevalently in the deep water. Second, technology development has shifted from the majors to the service companies. Now, in addition to this shift, the industry has dealt with boom-and-bust cycles that create an aversion to risk-taking. These cycles can also slow down technology implementation caused by the lack of experienced personnel and available funds.

The third trend is that investment and technology is down due to consolidation and cutbacks. Spending on R&D by the majors has been dramatically declining over the last several years.

And lastly, funding for basic research appears to be lagging. The research that is being conducted by large E&P companies typically focuses on near-term payoffs, and in some instances at the expense of longer-term research. Also, although not explicitly shown here, is the willingness to utilize technologies developed in

other industries.

Our production forecast is very dependent on the continued evolution of technology.

In closing, I want to reiterate the confidence that the Supply Task Group has in the North American resource base. However, I can't overemphasize enough the importance of a healthy E&P sector, armed with the best technology and fully staffed, and not encumbered by unreasonable restrictions on access, to explore for and develop this resource base necessary to meet the challenge of providing resources to meet this 29 TCF market over the next ten years.

Thank you, and I'll turn the podium over to Sue.

MS. ORTENSTONE: Thank you, Travis. It's a pleasure for me to present the key findings of the Transmission and Distribution Task Group.

There are four key findings that we found. Key finding number 1: Significant

expansion and enhancements of the delivery system are required to meet the growing market. And for your information, the definition of expansion is primarily new green-field interregional pipelines, and enhancements are expansion to the existing delivery system, such as loop line and additional compression.

Looking at infrastructure expansions, these are primarily the green-field pipelines. They are driven primarily some supply/demand shifts. And as Travis indicated, we're seeing tremendous growth coming from a few areas such as the deep water Gulf of Mexico, the Rockies, and Canada, and we're seeing declines in some areas such as San Juan coal bed methane and also the shelf in the Gulf of Mexico. So because of these shifts, we need to make sure that we get the infrastructure to the growing area so that we can bring this gas to market.

Also what's driving the new infrastructure is the growth in the electric generation sector that Wayne pointed out. We're

seeing most of the growth in this sector, and we need to make sure that we get laterals to these electric generation facilities. And these laterals are going to be primarily sourced from the transmission network to the plants because of the high pressures required in these new generating facilities.

And then last, we're seeing tremendous growth in peak day. The peak-day growth rate is growing faster than the annual average day use, and that's primarily driven, too -- we're seeing healthy growth in the residential and commercial, which is primarily a peaking market, as well as electric generation -- is adding to that peak in both the summer and the winter.

Looking at the specific infrastructure that our study looked at, we're seeing that we are required to put in 38,000 miles of transmission pipeline, which represents approximately 30 BCF of incremental interregional pipeline capacity. 38,000 miles is approximately 2,200 miles per year, which is right on target

with what the transmission sector has traditionally been installing. Looking at the distribution mains, there are approximately 255,000 miles required, which is about 15,000 miles per year, which is just a little higher than what that sector is currently putting in. And this is just the mains in the Lower 48, and it does not include connections directly to the specific end user. We also are going to require, because of the peak-day increase that I discussed previously, 850 BCF of working gas capacity.

And when you add all this up and you look at the investment capital for the transmission and distribution sectors, we're looking at $123 billion. $84 bill, or 70 percent of that capital requirement, is for the distribution sector; approximately 25 percent for the transmission; and 5 percent for the storage.

Focusing on peak day a little closer, because we are seeing some significant changes during the study period, our current peak-day capability is approximately 131 BCF per day. And

if you look back at 1997, just to give you a frame of reference, we had a peak day in 1997 of 111 BCF a day. So we had quite a bit of extra capacity to meet that peak-day need. If you look out in the year 2000, we're still having plenty of peak-day capability. But prior to the year 2005, we're in a situation where we definitely need to add to our peak-day capability. And looking out towards 2015, where we have approximately 154 BCF per day of peak-day requirements, we are going to have to add some significant facility expansion to meet that need, and that will primarily come from the storage I talked about. We'll probably be adding some alternate fuel capabilities such as propane.

Looking at the pipeline mileage graph, you can see that from the transmissions I've discussed, that the additional 38,000 miles of transmission pipeline that's required during the study pretty much is on track with what we've historically been putting in. And if you look at this slope on the distribution, you can see it's

a little bit steeper, but it's pretty much on track with historically what the distributors have been having to install. So it's definitely within our capabilities to make sure that this infrastructure gets installed.

Key finding number 2. Just like Travis discussed on the supply side, access issues are very important and they can impede installation of our infrastructure. Looking at it from a couple different fronts, first of all, it's very important for us to be able to get across public lands, get our infrastructure in, especially when we're coming from areas such as the Rockies that, Travis pointed out, we also, the pipeline group, has to be able to get in and get that infrastructure in so we can get that supply to the marketplace.

Also there's some issues along the existing right-of-way. We need to loop our existing right-of-way and we need to add compression. Also, when you look at the existing right-of-way, most of those lines were built in

the '30s, the '40s and the '50s, and they were on the remote parts of town. With urban sprawl, a lot of those pipelines are now in heavily populated areas. So we're dealing with more landowners. And there are more issues coming up, and there's not-in-my-back-yard type issues coming up that is making it harder for pipelines to expand their existing infrastructure where needed, again, to get that gas to the market. So we're having to deal with more landowner issues, and we just need cooperation to make sure we can get through those areas.

Also, because of the urban sprawl issue, and also with the information age, there is a lot more awareness of energy infrastructure. We're getting a lot more landowners involved. Many of you are probably familiar with the independence pipeline, which had over 5,000 interventions. A lot of those were driven primarily from landowners who were concerned about that pipeline infrastructure coming in place. And so those are issues that we as an

industry are having to deal with.

There is a pipeline that El Paso -- I'm from El Paso -- that we have a pipeline in north Alabama that is a Sonat (ph.) pipeline, and it is still not in service, it's two years delayed. And a lot of that delay has been because of some landowner issues and rerouting that we've had to deal with.

And then the last issue is, there are restrictions, of course, on permitting for environmental reasons, and a number of these issues we're having to deal with a lot more permitting. It's taking more time to get our pipelines in place. And some of the procedures that we have to go through are cumbersome. So we're asking to get that streamlined. An example of that is the Portland pipeline that just went in service this March. It was five months delayed. We had to get over 150 permits, a lot of those Federal, state and local, and a lot of them overlapped. So, we're looking for ways to streamline that process so that we can get our

pipelines in places quicker, again, to get that supply to the market.

Key finding number 3, new services are needed for the changing market. We have two things going on in the marketplace. One, the restructuring that you're all familiar with on both the gas and electric side. What that restructuring is doing, it's changing who is owning the capacity. It used to traditionally be the local distribution companies that owned the capacity. And now, as they are stepping out of that merchant function and that capacity is being assigned and also purchase directly from the pipes by other market players such as electric generators and producers and marketers, we're in a situation where we're having different stakeholders involved, and so we're having to come up with services to provide different market players with different kinds of services so that we can meet all their needs.

Also, operationally we have the electric generators who are coming more and more

on our system, and they have some operational issues that present challenges for the delivery system in general. First of all, as I indicated, a lot of the gas-fired electric generation, the new technology requires very high pressures. So we're having to site a lot of those new facilities off primarily the transmission system because of the high pressures. So we're going to have to operationally make sure that we can get them the pressure that they need.

Also, many of these plants are very large. Take a 500 megawatt plant, for instance. They need 100 million a day, very quickly. Sometimes they need to be dispatched very quickly or they need to be dispatched off very quickly. This provides a challenge for the delivery system. We have to be able to be flexible to get that gas to that plant or take it off quickly. You can use some line pack and you can use existing facility storage that is available. But as more and more of these plants get sited, we as an industry are going to have to meet their

needs. We're going to have to provide services to meet their needs. So this is all new and an evolving area for both the transmission and distribution companies.

And last, the electric industry is really on a real-time basis. They dispatch 15 minutes and less. We as a gas industry have done better, as far as getting better than a daily type dispatch. But we have to match the electric companies' dispatch and get the electric day and the gas day to marry up. So we have to get more flexible, and we have to provide those services to this very important market.

And the last finding that we have is the risk assumption for pipeline expansions is in question. What we're talking about here is that restructuring has changed the players, as I indicated before, and we in the pipeline industry have been very used to having long-term contracts. And as we're moving into an environment where we're having people more resistant to long-term contracts, they're looking

for shorter-term contracts. As we put in new facilities, we have to look for ways to put those pipeline facilities in, as we have a group of contract holders not wanting to take long-term positions on those pipelines. So, what the stakeholders and the pipeline sponsors are going to have to do, which could be producers, could be marketers, could be electric generators, could be the traditional pipeline players, we have to just assess how much risk we're willing to take before a facility gets put into place. And I think a lot of these new facilities will have to be put in without the long-term contracts that we're all so familiar with and used to having.

And with that, I'm happy to turn the podium over to Becky Roberts who I'm sure is very happy to give you the conclusions and recommendations. Thank you.

MS. ROBERTS: Are you getting the idea that we're all happy about this? We're happy to get to this day.

It is with great pleasure that I

provide you the conclusions on this report. As you've heard from the task group leaders, let me just recap very briefly.

First of all, the demand is definitely growing. We heard that there is potential for 29 TCF by the year 2010, and going past 31 TCF by 2015. We heard also that not included in that projection would be future environmental regulations that could also increase the use of natural gas. And we heard from the Supply Group that the resource base is there, and that's very encouraging news.

But we also heard that the production, or getting to the production from this resource base, is going to be coming more difficult, because the production is in deeper wells, deeper water, and more non-conventional resources.

We also heard that there were several issues associated with a healthy industry that's important to making this gas supply available.

And then we heard from the transmission and distribution sector that although the rate of

growth of the infrastructure is substantial, it's not beyond what the industry has done before. But some of the gain is playing. Some of the issues are definitely evolving on the market side and the risk-taking side.

We identified seven critical factors that must be addressed in order to meet that growing demand through 2015. Access to the resource base, as well as to rights-of-way for the infrastructure; technology development, and this is technology all the way from exploration to the burner tip; financial requirements. As you heard, we're looking at in excess of $1.5 trillion that will be need in the 2015 time frame, and about $781 billion of that is capital expenditures. We've heard that there is an issue with skilled workers, and we've identified that in many companies, more than -- or approaching half of the employees are facing retirement age in the next decade, and that we are having difficulty attracting young talent into our industry. The issue of rigs is a very

substantial issue from the production side. As the number of wells will double, our rig fleet must grow. Lead times is important not just to the transmission and distribution side for permitting, but it's essential that we face these issues now, because the lead times are so long in development. If we're not doing it now, we will not be able to impact the outer years of this study. And then last but not least, we must be aware of the requirements of our customers. As our customer base changes, particularly as the electricity generation market grows for gas, we need to recognize that their needs are different and we must be able to respond to them.

As I mentioned earlier, we took an approach on our analysis that we called sensitivity analysis, and we attempted to quantify some of these issues, at least, so that we have a context to discuss them.

The econometric model generates a price. We want to emphasize that this graph is not a forecast of price, but it's an indication

of trends and the factors that can ultimately influence the economics of gas supply. As you see, historically of course we have -- the price has fluctuated. Our model indicates that those fluctuations will continue, not only as supply and demand changes with time, but also with seasonal responses that are not built into our analysis.

We indicate in the blue area, again, a range of outcomes that can be influenced by the assumptions that have been made in this analysis.

To further look at the assumptions, we developed a tornado diagram that gives you a relative indication. Starting at the top, this is the influence on gas demand. You can see that the resource base, the size of the resources base greatly influences the demand, and that is because the greater the resource base, the more potential production is closer in the U.S.; therefore, the lower the price.

Increasing the resource base by 250 TCF resulted in a corresponding increase in demand of

about 1.4 TCF. And we'll get to price in just a minute.

You can see that oil price is very important to the demand, and again this is because of fuel-on-fuel competition, but it also is important because it influences how much capital we have to spend on new production and new infrastructure.

Upstream technology plays a very important role, and this is a factor that we can influence. In fact, it was surprising to some of us to find that it was as influential as the price of oil. Now, of course GDP is a natural driver of demand.

Now, what you see here are the factors from the integrated model, that takes a look at all the parts of the business. What's not included were some of the demand factors that Wayne mentioned. In coal capacity utilization, if that capacity utilization doesn't grow, we can see a significant increase in demand there, regardless of price.

The nuke retirements. If nuclear capacity is retired at a faster rate or if more of that 15 gigawatts that is retired actually does stay on line, can have an influence, too, of about .8 TCF up or down.

Moving to price. Again you can see that the resource base is one of the key drivers to the price of natural gas in the future. Technology, GDP growth, oil price, are also very significant. And again, technology can be influenced, although GDP growth and oil price really can't be, as much as we'd like to try.

But the resource base is important. And the first would be, well, how do you influence the resource base? Well, you can learn a lot more about it, and that's very key. We can invest in exploration and seismic interpretations.

But this graph actually gives you an indication of the access issue. Because in our analysis, we actually -- the model assumes that the reserves that are restricted are not

available for development. So, in effect, reduces the size of the resource base for modeling purposes.

But to do a little more investigation on that, we built a sensitivity case, two cases, of high -- increased access and reduced access. And if -- this is on actually the U.S. production in those access cases.

If access is increased -- and this is assuming that restrictions in the Rockies are lessened, so that you don't get the two-year delay; it also assumes that the moratoria on the offshore waters are lifted by 2004 so that development can begin -- you can see through 2010 there is an effect, but it's not a huge effect. But where it really starts gathering steam is in the 2011, 2015 time frame. And in that time frame we can see an increase of almost 1.6 TCF of U.S. production.

Now, on the reduced access, you don't see as large an effect, and that is because our model assumes already that there are significant

restrictions, and the reduced access is not significantly restricting it more. The offshore is as it is today.

Now let's move over to price and discuss that. Again, as you move into the outer years, you can see on the lower green line that the increased access case can reduce the price in future years by 40 to 50 cents. We feel that this is a very significant part of this study. The analysis of access represents really the first time that the industry and government have sat down and mapped out some of the impact of access. And one of our recommendations, as you'll see in a minute, is that this effort continues, so that we can plan this and not just react to it.

With that in mind, our first recommendation is to establish a strategy at a national level for the use of natural gas in the United States to meet our economic goals and to meet our environmental goals. To accomplish this, we recommend the formation of an

interagency work group that would be dedicated to natural gas, and to working with the industry and other stakeholders to remove the obstacles that are in our way for developing our future production.

Recommendation 2 is that we continue the work that has been done between industry and government to assess the access restrictions. And that would include the continuation of the study that was done, particularly in the Rockies, expanding that beyond the regions that have been thoroughly analyzed; evaluating and prioritizing the access regions by potential for gas production versus the sensitivity of the environment in those areas. We recognize that there are some areas that should not be developed because of environmental concerns. However, we feel like the improvements that the industry has made in environmental footprints warrants a renewed look at the potential for these areas.

And then third, we say that we recommend that we select areas for development.

And this should be a concerted effort of opening up some of the restricted areas for development.

And fourth is to plan for long-term sustainability. At some point, though probably not in the time frame of this report, the United States will have to be looking outward to other sources of gas. This might come from the far reaches of the Arctic. It might come from Alaska. It might come from south into the Latin American region. It might come from LNG import increases, new facility. Or maybe something as far-reaching as hydrates. But we also recognize that all of these things require great expense and a long time of planning. And so, we recommend that, with the formation of this interagency work group, that we continue to look at our long-term future and consider some of these alternatives and what it would take to get those implemented.

Research and technology, as we've mentioned, is one area that we can definitely influence by investment in research, both by the

government and by the industry. We've had tremendous success in recent years with industry consortia, particularly in areas such as the deep offshore -- deep water development. We had a consortia called Deep Star that has generated some wonderful breakthroughs. We would like to see that continue, and we encourage industry to continue and encourage the government to work with us, as well as to look outside of our own industry for new technology that could be applied inside. And then also, we encourage the government to continue to promote the high efficiency gas-use technology, and work on the demand side as well.

Planning for capital infrastructure and human resource needs is essential. It's a call to our industry to recognize that there are problems in the making and that we must address them, particularly for work force needs. For the drilling industry we recommend the formation of a task force that would further analyze the availability of rigs and the needs for the

future. And then we also ask that the government examine potential financial incentives that would help the industry bring new production on line. And that could be for the more expensive or the more technically difficult production, as well as the marginal wells that -- in the more traditional areas.

As Sue mentioned, streamlining processes is a way that can benefit both the development of the supply and the infrastructure as well as the government, because this reduces expenses to everybody, taxpayer included. And we encourage those efforts. While they have already begun in many of the agencies, we encourage that this continue.

We strongly suggest to the government that before additional environmental regulations are passed, that there be an analysis of the impact on natural gas demand. It's very difficult to apply new restrictions and expect the industry to be able to just turn on the tap for new supply. This is going to take planning

on both sides.

And then our final recommendation is to design new services to meet the changing customer needs, and to be prepared to respond to the market as it does change.

And, Peter, it's again with great pride that we submit this report for the approval of the Committee. We would also like to note that we are now completing the Task Group reports. This is -- each task group is preparing a pretty large volume of information that backs up the summary report. And we propose as process that these reports would be mailed to the council members in late December, and that we would request a fax vote of approval on those reports by mid-January.

Peter, I'll turn the podium back to you.

MR. BIJUR: Thank you. And Becky, Wayne, Travis and Sue, excellent job of presenting a very complete report.

I think you can see by the scope and

breadth of the work that was done here that this team and the committee that worked with them truly looked at all of the aspects of what it's going to take to be able to develop the resource base, which they have included exists, and turn that resource base into live natural gas that can fuel our future.

The one challenge that we face is doing something about this. If we simply take this report and put it in the drawer, it will not be worth the effort that has gone into it in the past year. It is my fervent plea to everybody involved that that not happen.

Becky and the team made some very interesting conclusions, particularly with respect to lead time. We can't wait. If we do not begin today to ensure that we have a healthy oil and gas industry; if we do not begin today to ensure that the industry has the access that we need to develop the reserves; if we do not begin today to build the rigs that are going to be necessary to build two times the number of wells

that are currently being drilled in order to develop the reserve base, then we simply will not make the targets that have been set out here. We simply cannot get that resource base from the Gulf of Mexico or from the Lower 48, or for that matter, through imports -- that will have to be used to make up the difference.

You saw the LNG piece. It's very small. And it's not going to get any -- much larger than that. We cannot depend on LNG resources. We're going to have to develop our own resource base and we're going to have to be smart about how we do it.

And finally, I think one of the most telling and important conclusions has to do with the people that come into this industry. Nothing can be done without people. These rigs don't run by themselves, they don't get built by themselves. We need geologists, we need geophysicists, we need petroleum engineers of all types. And today with the computer science business growing the way it is, if you had a

choice to make between becoming a petroleum engineer or a computer engineer, which one would you choose? And it is our challenge as an industry, and it is the challenge facing the government of this country as well, to provide the industry with the talent, the knowledge management it needs in order to meet the objectives set out here by the government and the industry jointly, and so very well described in this study.

So, Joe, I move that the NPC approve the report subject to final editing based on comments from Council members, and to approve the process for finalizing the Task Group reports.

I'd also like to note here that the Committee has recommended that this study, this work, be dedicated to Collis Chandler, who passed away earlier this year and is truly one of the legends in our industry.

So, Joe, I turn it back to you, and I have that motion on the floor.

CHAIRMAN FOSTER: Okay. Thank you,

Peter. And let's give Peter and the whole group a round of applause.

(Applause)

CHAIRMAN FOSTER: I sat in on the initial planning meeting for this report, and they've done a remarkable job of turning chaos into order and succinctness, and I commend you for the work you've done and for the conclusions you've drawn.

The floor is now open for discussion or questions from any member of the Council about this report, or any comments.

(No response)

CHAIRMAN FOSTER: Wow. It was --

MR. STEWARD: I second the motion.

CHAIRMAN FOSTER: We have the motion that's been seconded. Any questions or comments?

(No response)

CHAIRMAN FOSTER: Hearing none, those in favor of adopting the motion made by Peter, signify by saying aye.

(Chorus of ayes)

CHAIRMAN FOSTER: Opposed, no?

(No response)

CHAIRMAN FOSTER: Motion carries. Very good. Very good work. And thank you very much.

At this time, we have a sad item to deal with on our agenda. We lost two of our long-term and very dedicated members during the course of the year, Leon Hess and Collis Chandler, as was just mentioned, and we have memorial resolutions for each of those. Henry Rosenberg will present the one on Leon Hess.

MR. ROSENBERG: Thank you, Joe.

Sadly, but humbly, I have the privilege of speaking about a long-time good friend of mine, the entire oil industry and the business community. About a man who truly started from the ground up, driving trucks, and expanding in and about the oil business. It was not unlike Leon to work day and night receiving and delivering oil, personally paying Hess bills by hand, and even coming to Baltimore, to Crown, in the late '30s and '40s. He truly worked the

business, and expanded from there to many interests and endeavors.

This was Leon. A quite, forceful, unassuming man, with many talents and many successes. Doing things and taking on projects that others would dare to try. Very rarely in this world has anyone achieved such success, not only as a true businessman, but also as a man serving not only the industry, but his beautiful wife, children and grandchildren at the same time. This is truly success, and that is what it is all about.

With these few words and lots of feeling and thoughts, I would like to offer the following Memorial Resolution:

The members of the Natural Petroleum Council was deeply saddened by the death on May 7th, 1999 of their distinguished colleague, Leon Hess. Leon was born on March 14th, 1914, in Asbury Park, New Jersey, the son of a Lithuanian immigrant. During the depth of the Depression, he joined his father's struggling oil delivery

business. He returned after service in World War II and quickly built up the company. By 1938, Hess had 12 trucks and was able to build his first oil terminal. He eventually expanded into drilling, refining and exploration. In 1969, he took over Amrada Petroleum Corporation.

Mr. Hess served as Chairman and Chief Executive Officer of the multi-billion-dollar Amrada Hess Corporation for the next quarter century, and was known as a man whose handshake was his bond. He shunned the limelight and made family a hallmark of the Hess corporate tradition. Outside of his family, one of his greatest personal interests beyond the oil industry was his New York Jets football team. As a member of the Natural Petroleum Council, Leon's advice was sought by successive Secretaries of Interior and Energy for over 30 years. He served as an active participant on several study committees, and willingly contributed corporate staff and information to the study efforts.

Therefore, with sincere admiration for

his achievements and contributions to the industry and the Council, and with a sincere sense of great loss, be it resolved on this 15th Day of December 1999, that the deepest sympathy of the members of the Natural Petroleum Council be extended to Leon Hess' widow, Norma, and to his family.

It is further resolved that this resolution be entered upon the permanent records of the Council, and that an appropriate copy therefore be delivered to his family as a remembrance of the Council's esteem and deep appreciation.

I have with me here a bound resolution which I would like to and will present to Leon's son, John, on behalf of the Council.

And, John, we're so pleased and happy that you're with us today. And we thank you. And God bless you and your family. Thank you.

(Applause)

CHAIRMAN FOSTER: Thank you very much, Henry and John. We're glad you could be here

today.

Cort Dietler will present the Memorial Resolution for Collis Chandler.

MR. DIETLER: Good morning. Mr. Chandler was a dear friend of mine, and I feel quite privileged to present this memorial statement in his behalf. Certainly he believed in this industry as much as any human I've ever meet. He worked at it full-time.

Memorial Resolution to Collis P. Chandler, 15 December 1999. The members of the Natural Petroleum Council were deeply saddened by the death of their distinguished colleague, Collis Chandler, on May 4th, 1999. Collis was born in Tulsa, Oklahoma in 1926. He served in the Navy during World War II. And after graduating from Purdue -- and trying to live it down, of course -- (laughter) -- began his career with Sohio Petroleum. In 1954, he founded the first of a succession of Denver-based oil and gas exploration and production companies that would bear his name through the balance of the century.

Collis was first appointed to the Natural Petroleum Council in 1965, and served as a member continuously after 1969, holding leadership positions. He chaired the Council from 1976 to 1979, a crucial period in its history during which the Council's functions were transferred from the Department of Interior to the Department of Energy and the nation's energy market suffered major disruptions following the Iranian revolution. Collis chaired the Council's Nominating Committee for the last 13 years, and in addition, he has been active as a participant in numerous Council studies serving on various committees, subcommittees, task groups.

Collis held leadership positions within a number of other industry organizations. He served as Chairman of the Natural Gas Supply Association, President of the Rocky Mountain Oil and Gas Association, an officer of the Independent Petroleum Association of America, a Director of the Gas Research Institute, and the Director of the American Petroleum Institute,

serving on all of API's leadership committees. The honors and awards that Collis received reflect the esteem in which he is held by his peers.

At the completion of his term as the NPC Chairman, the Secretary of Energy awarded Collis the Department's highest honor, the Distinguished Service Medal. In 1994, in recognition of his lifetime of service to the industry, he was awarded API's highest award, the Gold Medal for Distinguished Achievement. Collis was also the recipient of numerous other awards, including the Texas Midcontinent Oil and Gas Association Independent of the Year award, and the Rocky Mountain Oil and Gas Association's Life Membership award.

Therefore, with sincere admiration for his achievements and contributions to the nation, to our industry and to this Council, and with a sense of great loss, be it resolved on this 15th Day of December 1999, that the deepest sympathy of the membership of the Natural Petroleum

Council be extended to Collis Chandler's widow, Patty, and to his family.

It is further resolved that this resolution be entered upon the permanent records of the Council, and that the appropriate copy thereof be delivered to his family as a remembrance of the Council's esteem and deep appreciation.

Thank you.

CHAIRMAN FOSTER: Thank you, Cort. And if you'll deliver that to Patty, who is here today, we appreciate that very much.

(Applause)

CHAIRMAN FOSTER: Both these men were giants in our industry, and most of us in this room knew them and admired them and sought their counsel, and we'll miss them greatly.

Let's signify our approval of these resolutions by standing for a moment of silent prayer and reflection about Collis and Leon.

(Pause)

CHAIRMAN FOSTER: Amen. Thank you.

Well, it's back to business, as both these gentlemen would have us do it.

As I said earlier, Secretary Richardson could not be here today. He has asked his Deputy Secretary, T.J. Glauthier, to represent the Department this morning. T.J. has been at DOE only nine months, but he's certainly no stranger to energy policy, having spent five years as OMB's Associate Director for Natural Resources, Energy and Science. He now serves as DOE's Chief Operating Officer and the Government Cochair of our Natural Gas Committee.

And so we're very please to hear from T.J. Glauthier today, Deputy Secretary of Energy.

MR. GLAUTHIER: Thank you, Joe. Thanks very much. I am pleased to be here. Secretary Richardson would have like to have been here, and the scheduling conflicts just were impossible. As many of you know, he's been chairing a meeting for the last two days in Tucson of African Energy ministers. And I believe at last count we had 44 ministers from different African countries all

together to deal with the issues of energy and development there in Africa., So, he sends his greetings, and sends me and Joe Habiger (ph.) and Bob Kripowicz and Bob Gee -- good representation here.

We are very interested in the report that you've just conducted, or just concluded and accepted, and really appreciate the opportunity to accept it from you.

The question you're addressing in this report, whether the gas industry can respond to projected demand growth and at the same time keep supplies reliable and prices affordable, goes to the very foundation of our future energy and environmental strategy. Given that so much is riding on the future development of our country's natural gas resources, and the substantial time and senior attention that's been given to this report, it's clear that this is one of the most significant studies that this Council has ever conducted. I want to convey the Secretary's personal thanks to the members of the Committee,

the task groups and others who invested considerable time over the last year to conduct the analyses and prepare the study.

I particularly want to acknowledge Peter Bijur, who headed the Committee and took on this task with both enthusiasm and commitment to produce a quality product; Joe Foster, your outgoing Chairman, who demonstrated his personal interest in this effort by participating in several of the subcommittee meetings.

I want to acknowledge the two Vice Chairs of the Natural Gas Committee also. Leighton Steward and his team at Burlington Resources, and Bill Wise and his staff from El Paso Energy Corporation. They put not only their time, but their company's resources behind this effort.

I particularly want to thank Rebecca Roberts from Texaco, over in the corner there, who picked up the subcommittee chair in midstream and did an excellent job in pushing the group toward your final product.

I want to also acknowledge the three task group leaders: in Supply, Tommy Nusz; Demand, Matt Simmons; and Distribution, Sue Ortenstone. The effort that was carried out on this was truly impressive, with the number of people who participated in each of these groups and the amount of time and attention and devotion that they put into it.

I also want to recognize the contribution of our Federal agency team members: Bob Kripowicz, who was the Federal Cochair. Bob, thank you for your effort on this. And Tom Frye and John Northington from the Department of Interior, who participated very actively.

The Administration has been working hard to support your industry over the last seven years. We've passed financial incentives such as the Royalty Relief for Deep Water, Heavy Oil and Marginal Oil Wells. We supported the Federal Oil and Gas Royalty Simplification and Fairness Act which the President signed in 1996. We lifted the ban on exports of Alaskan oil. We've carried

out the largest privatization in history, the Elk Hills Reserve out in California, the nation's tenth-largest oil field. In fact, I was honored to be part of all those efforts when I was at the White House at OMB, and I know the effort that went into that on the part of both the Federal officials and industry people in each of those cases.

And this year, we've managed to put through a royalty-in-kind program. And in fact, just a few days ago, signed the final contracts to transfer the last of the 28 million barrels of Royalty oil from offshore production in the Gulf to the Strategic Petroleum Reserve. This, as many of you remember, was one of the Secretary's initiatives back in February when oil prices were at historically low levels.

We've also made a strong commitment to gas R&D, increasing our support for gas-related research by 57 percent over the last six years. And we're beginning to see the benefits of many of our joint efforts with industry. For example,

in south Texas, we've seen success rates in locating and producing gas average something like 78 percent, because new seismic and drilling technology has allowed those to be strategically targeted. In fact, our secondary gas program has identified drilling and production strategies that have added more than a billion dollars in new gas reserves in south Texas and helped revitalize gas production in portions of the midcontinent region.

In the past year, we've expanded this program to one of the world's most prolific gas-producing regions, the northern Gulf of Mexico. This effort could be particularly important, given (indiscernible) the Gulf could account for more than half of all new domestic gas production over the next 10 to 15 years.

In Wyoming we've helped develop fracture imaging and drilling technologies that have led to the first commercial production of unconventional gas from deep, over-pressured tight sands in the greater Green River basin.

And we haven't ignored the demand side of the equation. We're on the verge of producing a revolutionary natural gas turbine for electric utilities that will break through the 60 percent efficiency threshold, long considered the 4-minute mile in gas turbine efficiency.

We're continuing our support for fuel cells, micro- and mid-size turbines and gas-fired reciprocating engines, all of which can increase the role of natural gas in meeting our future energy demands, especially for distributed power applications. And just last week, on Friday, the Secretary made a major announcement that will help us build on these accomplishments.

He was in Morgantown, West Virginia, to announce that our Federal Energy Technology Center will now be elevated to the full status of a national laboratory, will now be called the National Energy Technology Laboratory. He indicated his intent not only to boost the Center's reputation, but its responsibilities. And chief among the new responsibilities will be

a bigger role in natural gas research. The Secretary announced his intention to formally establish within the new laboratory a Center for Advanced Gas Studies, an organization that will lead the department's efforts to bring together a strategic program for natural gas across all departmental lines of organization.

The Secretary was quite clear in his intent, and all those you know -- who know Bill Richardson know how clear he can be when he wants to be very clear. He said we need one place that looks out for the future of natural gas from bore hole to burner tip, one place that understands the innovations needed to produce tomorrow's gas. We need a single focal point that knows how it moves from the wellhead to the consumer, one organization that can fill the gaps in our natural gas portfolio; for example, to ensure that our gas infrastructure remains reliable.

To make this Center for Advanced Gas Studies a reality, staff from the laboratory and from other offices within the Department will

begin working on a coordinated effort with industry to develop a vision for the gas industry of the 21st century. They will build on the study that you're presenting today, looking at both technological and policy matters. The effort will identify gaps based on your assessments, cross-walked against initiatives already underway in the Department or in industry, and will develop efforts to fill those gaps.

We were pleased to see that the American Gas Association's President and CEO, Dave Parker, has already endorsed this new center and the commitment that we're making to develop the full potential of our gas resources. Getting the Department's act together is one major step forward, but it's only a step. That's why we appreciate the effort you've put into this report, especially your recommendation for establishing a high-level interagency working group on natural gas.

The Secretary is prepared to take this

recommendation to the National Economic Council. We also agree that a balanced long-term approach should be developed that addresses the full potential of the nation's natural gas resource base. That is why in the important area of access to federal lands, we will commit to expand the work that we're doing in the Rocky Mountain region with the Bureau of Land Management to analyze the extent and impact of access restrictions. We also agree with the need to maintain the momentum of technology R&D.

We will be working with the industry to develop a better, more complete technology road map, and we will be including several natural gas-related initiatives that will fill important gaps in our R&D portfolio when we submit our fiscal year 2001 budget in February, particularly in the area of gas infrastructure. In short, we are committed to working with the industry to build toward a 30-plus TCF gas economy in the first decade of the 21st century.

We agree with you that such growth in

gas demand can be achieved, but also share your view that it will take hard work and coordination among our public and private sectors. We want to ensure that this industry has the best chance to reach its full potential and to contribute its full share to our energy and environmental future. As we work together over the coming months, we want to be sure that we take action on these recommendations.

This is more than just a report. It's been referred to as a road map which is only useful if you're going somewhere. As we move forward, we need to continue the effective public-private partnership that has produced this study. Let us work together to translate these recommendations into real actions. I'd be willing to take a couple of questions, Joe, if you want to do that now.

CHAIRMAN FOSTER: Sure. Let the folks ask questions or comments to those, if you'd like to make them, to T.J.

MR. GLAUTHIER: Yes?

A PARTICIPANT: Secretary, how efficiently do you think the, Secretary of Energy's office will be in getting these recommendations (Indiscernible)

MR. GLAUTHIER: Well, I guess there are two parts to that. One part is getting the recommendations out to people, and the other is can we get them implemented? Can we get them acted upon? We are going to distribute these recommendations. And we're working on a plan for how to do that in a way that will get it to both everyone appropriate within the Administration and to the members of Congress, particularly the key committees and key members.

But we want to do more than just send the report out, so we're going to need to do something that will be more targeted. We'll work on that, and try to work with your committee representatives on that as well. The key then is going to be implementation, what can we do, and what can we do quickly that will get the ball rolling? The recommendation on the task force

for the National Economic Council is certainly one of the most specific things that we can do.

And later today, Bill Richardson and I will both be meeting with John Podesta (ph), the Chief of Staff of the President, and we will bring this up to him and suggest that we move ahead on it. There already is a task force working on oil issues, or petroleum industry issues. And it may be that we can get that group to also help move in this direction. But we are very serious about it and certainly, the recommendations on the budget have already helped us.

In early November, I went to New Orleans and met with the committee as it was finalizing the report. And we've used the recommendations that we've gotten from his earlier drafts in the discussions on the budget throughout the fall. We're quite serious about it. I hope we can do it. But we're going to need to work together. We've got to do this as a team. Yes?

A PARTICIPANT: Would you care to address some of the access issues that are raised in this report since at various times and places the Administration has proposed access?

MR. GLAUTHIER: Well, you're certainly right and the report is right in noting the sensitivity of the issue. What we want to do is to try to build on the cooperation that we've gotten with the Department of Interior's Bureau of Land Management and look carefully at the issues that are restricting access, to follow through the kinds of things that are in the report, and to work together.

But I think this is going to have to be done very carefully. It's not going to be something that we're going to be able to charge in and just override a lot of existing procedures, environmental protections. I think that this is an area that everyone understands is going to be difficult to work in, but we're optimistic that we can actually make some progress in it, if we go at it in this way.

A PARTICIPANT: Do you think it might be helpful for some of the people in this room to maybe just talk a bit about how this interagency task force works and how it might make some progress on this issue?

MR. GLAUTHIER: Sure. As many of you know, the Administration, with its various agencies and departments, cannot make much progress on interagency issues unless those come up to the White House. On issues like the access ones, if it's simply the Department of Energy, the Department of Interior, the Department of Agriculture where the forest services are trying to work together, there's a limited amount that we can do.

Sometimes, we can work things out cooperatively. But the greatest progress occurs when we actually get some coordination from the White House. And on the earlier issues that I mentioned, that's what happened. When we decided to allow the Alaskan oil to be exported, for example, to change that ban, that was done

through an interagency task force led by the National Economic Council, the NEC. The same thing was true for the Deep Water Royalty Relief where bringing the agencies together, the Treasury Department and others, we were able to actually look at the issue, what the benefits were, what the downsides were, and get a decision made.

That's what the benefit will be of having this kind of a group look now at the issues that are raised in your report. If we can get the NEC to take a leadership role in it, we can then be sure that the agencies will come to the table and engage seriously. So that is, I think, an appropriate recommendation in your report, and we will push that along and try to make it happen.

A PARTICIPANT: How is the Center for Gas Studies going to be funded?

MR. GLAUTHIER: It'll be funded in our budget for what has been the FETSE offices. It'll be part of our regular budget request, and

then the projects and the like will be funded through regular appropriations. It will be identified in our budget request. We don't -- do not at this point have a specific number attached to it, of exactly how many dollars there will be. You had a question?

A PARTICIPANT: I have seen a lot of wonderful reports submitted over the last several years. And many of them are placed just where Peter suggested we don't want this to land, and that's on a desk. I think the interagency task force idea is driving this activity forward and is certainly laudable. But I'm puzzled about who is going to chair it, and who is going to see to it that this really is carried out?

MR. GLAUTHIER: I'm not sure if everybody could hear, but the question was, this interagency concept, the recommendation, sounds good. Maybe it could make a difference in implementation, but who's going to lead it? Who's going to really make sure that it gets carried out? And I think that is a serious

question. The National Economic Council itself has a lot of issues that they're dealing with. So I think they can do a lot to facilitate the coordination, but I'm not sure that they will have the same degree of commitment to make sure these issues all actually get resolved that we want.

So I envision Secretary Richardson continuing to push from his side and -- with me and with others to make sure that the White House is hearing from us. And if that is not moving, if it's not going someplace, that he'll use his considerable resources to push it along.

A PARTICIPANT: Well, there's a time factor involved here. People come --

MR. GLAUTHIER: Yes.

A PARTICIPANT: -- and people go. But the work of this task force obviously is going to span a great number of years. As you can see, this plan is going into 2015. That's roughly four administrations. And I'd be pretty hopeful that it would be -- that there's an important

role here for this Council to be able to see to it that there's continuity of this effort; otherwise, it will die.

MR. GLAUTHIER: Yes, that's a very real issue. And we actually talked last night about this a bit, and how to make sure that the information, the recommendations, here are conveyed to both parties so whichever new administration comes in next year will have familiarity with this and already be engaged in it, how we get it to the members of Congress so that it's also got a life and a base of support there. We need to do a number of things that way so that it doesn't become just a function of this administration and end on January 20th of 2001. You're absolutely right. All right.

CHAIRMAN FOSTER: Thank you very much.

MR. GLAUTHIER: I hope we can actually move ahead in partnership and make this happen. Joe, thank you.

CHAIRMAN FOSTER: Thank you, T.J.

(Applause)

CHAIRMAN FOSTER: I'm going to exercise the chairman's prerogative and have a 10-minute break. We'll resume in 10 minutes whether you're here or not.

(A short recess was taken.)

(Discussion off the record.)

CHAIRMAN FOSTER: A year ago, I started trying to get in touch with Lee Raymond to ask him to be chairman of a refining study committee. I had a great deal of difficulty getting in touch with and was -- didn't understand why he was so busy. I found out later why he was. But he still agreed to serve as chairman of this refining study that we're going to hear about just shortly. He couldn't be here today to talk about it himself.

But we do have Don Daigle from Exxon, who's the chair of the coordinating subcommittee, and is a guy who's basically got the responsibility for keeping this thing rolling, here to talk to us today. So I'll call on Don Daigle to give a report on the refining study.

MR. DAIGLE: Thank you, Mr. Chairman. Even I have a little trouble remembering I'm from Exxon-Mobil now. But seriously, I'm very pleased to be here. Mr. Chairman, ladies and gentlemen, I'm really pleased this morning to have this opportunity to report on the activities of our refining industry study.

In June of '98, then-Secretary of Energy Pena requested that the Council update the 1993 refining study. Secretary Richardson subsequently reaffirmed the need for the study. The DOE was interested in an assessment of the implications of potential changes to product quality requirements on the viability of the refining industry and domestic product supplies. A copy of Secretary Pena's request letter is included in your information packet.

Last December, the NPC agreed to undertake this study, and as the Chairman indicated, Lee Raymond agreed to chair the committee on refining to direct it. This first slide summarizes the scope of the study as

adopted by the committee last spring. We're examining potential refining, and product supply issues that might arise from more stringent product quality specifications being contemplated for implementation over the next few years.

The timeframe being considered is (indiscernible) 2005, though some of the specification changes may occur somewhat before that and some after that date. The specific product quality requirements being considered include a base case with gasoline sulphur reduced to 30 parts per million average. As you are aware, EPA is expected to issue the final gasoline sulphur regulations very soon. On top of this base case of gasoline sulphur reduction, we're examining three sensitivity cases.

The first is a reduction in on-road diesel sulphur to 30 parts per million average. The second examines restrictions on MTBEUs with and without an oxygen mandate. The third is a reduction in drivability index to 1200 at retail. Now the diesel, MTBE and drivability index

changes are being examined individually and also in aggregate. We will also be commenting qualitatively on issues associated with very low gasoline and diesel sulphur levels of about 5 parts per million.

The focus of this study is to assist the DOE in understanding the implications of these environmental-driven product quality rulemakings. We are developing cost estimates for specific cases, but precise cost estimates are not the primary focus of our efforts. Rather, we have chosen these cases to allow us to identify the potential implementation and supply issues that should be considered in adopting more stringent product specifications. We'll also identify actions that the government might take to facilitate smooth implementation and minimize potential supply disruption.

The 1993 study took over 3 years to complete. Our schedule for this study is considerably shorter, with completion planned by next June. To meet the tight schedule, this

study has emphasized maximum reliance on other existing studies and building on the extensive work done for the 1993 study while minimizing new, original analysis effort. We have made direct use of gasoline sulphur modeling done for the API and NPRA, and diesel sulphur modeling done for API and the Engine Manufacturers Association.

We have drawn from some of the analyses of MTBE phase-out done for the California Energy Commission, but we have performed some additional modeling of MTBE cases as well. We are also performing some grass roots modeling of drivability index reduction cases. I am pleased to report today that with the help of many of your organizations, this effort is making good progress. Shortly after last December's agreement by the Council to undertake this study, the committee on refining was formed to direct it, and a coordinating subcommittee was formed to carry out the study analysis.

A roster of the committee and

subcommittee is included in your materials today. The coordinating subcommittee subdivided the work effort among four task groups as shown in this next slide. The producibility task group, led by Mr. Guilliam (ph) of Marathon Ashland, has been examining the effects on refinery producibility of the product quality changes and analyzing the investments and the costs associated with producing these new fuels.

The technology task group, led by Mr. Leider (ph) of Equilon, has been evaluating the cost, applicability and commercialization status of a numerous gasoline and diesel reduction technologies. Their findings have been applied to the refinery modeling studies that formed the basis for this study. They have also examined octane replacement technologies which are important to the MTBE cases.

The logistics task group, led by Mr. Thompson of CITGO, has been assessing the effects of these quality requirements on the logistics system downstream (ph) of the refinery. They are

examining not only operability issues and investment issues, but also compliance assurance and enforcement implications as well. The imports and other factors task group is being led by Mr. Klese of Ultramore (ph) Diamond Shamrock. This group has a twofold task.

The first is to assess the likely competitiveness and the availability of product supplies from imports. The second is to examine the implementation issues associated with modifying the domestic industry to meet these new requirements based on the analysis provided by the producibility and the logistics task groups. In addition to looking at product quality requirements, this group has also reviewed and updated the stationary source emissions reduction requirements that were forecast in the 1993 study.

Each of these groups has been working enthusiastically over the past 7 months to complete this analysis. While we've divided the study work among the groups, their efforts are

highly interrelated, as shown by this next slide. Here, we see some of the key interactions among the work groups. This slide was used at one of our coordinating subcommittee meetings to review and to plan the key information flow among the groups. I don't intend to cover the items in detail, but I present it here just to give you a feel for the interactions and the complexity of the analysis.

To accomplish this interaction, many of the work group meetings had included members of other groups, and there have been many joint meetings. In addition to the work group efforts, the coordinating subcommittee has met six times to review and to direct the work progress. In fact, they just concluded a meeting in Houston on Monday and Tuesday of this week.

Now while much of the analysis is wrapping up, some work continues in a few select areas. This final slide shows our plans for completing this study. Initial drafting of the report is underway, and drafting will be a major

focus of activity in January. A coordinating subcommittee meeting is scheduled for February 10th to review and comment on the draft report. We'll then revise the draft based on subcommittee comments and return the revisions for review at a subcommittee meeting scheduled for March 16th.

We expect to deliver a draft report to the committee on refining for review and comment in April, and we look forward to presenting a proposed report to the Council by the end of May for publication in June. As chairman of the subcommittee -- coordinating subcommittee, I would like to thank all of you involved for the contributions of time and expertise by your organizations. I would also like to thank the DOE and the EPA personnel for their extensive and constructive participation on the subcommittee and on each of the four task groups. Thank you.

(Applause)

CHAIRMAN FOSTER: Well, thank you, Don, and the floor is certainly open for questions, if any member has any questions or suggestions to

make to Don.

(No response)

CHAIRMAN FOSTER: It's not a very inquisitive group today, is it?

MR. DAIGLE: That's good.

CHAIRMAN FOSTER: All right.

MR. DAIGLE: Thank you, Chairman.

CHAIRMAN FOSTER: Thank you very much, Don. Last July, I asked the members of the Council to vote on Secretary Richardson's request that it provide -- the DNPC provide advice on approaches to the protection of the nation's critical oil and gas infrastructure. And the vote was very positive on that matter, and so I consulted with our (Indiscernible) committee chaired by Bob Palmer and we agreed upon a representative group of Council members that would form a committee to study these issues.

We submitted that roster to Secretary Richardson for his approval, and that was approved by him. And then, one of the things I'm most proud of is that we were able to get Dick

Cheney, who's had previous government service, as you all know, and is now the CEO of Halliburton, to serve as chairman of this committee on critical infrastructure protection. So at this point, I'd ask Dick Cheney to make a brief presentation or report on their plans.

MR. CHENEY: Thank you, Joe. It wasn't hard to get me to agree to chair this committee. Joe arranged for Ray Hunt, who happens to be the chairman of the compensation committee of my board of directors, to invite me to undertake the assignment. And I mean, how could I say no? But I am pleased to participate and to have the opportunity to take on the assignment, and I have a -- strong feelings on the subject, given my time in government.

If you spend any time thinking about, from a military perspective, our increasing capability to literally shut down all the key systems in a -- and on the part of an adversary, and then think back about our potential vulnerabilities as well from that perspective,

you'd begin to understand, I think, why it is very important for us to take on that assignment and take a good look at what our key vulnerabilities might be in terms of our oil and gas infrastructure.

Obviously, there's work going on on a number of other crucial components, such as banking, telecommunications, electric power, transportation. And I think it's altogether fitting and appropriate that we take on that assignment with respect to the oil and gas infrastructure as well. As Joe mentioned, we've established and had approved by Secretary Richardson and NPC-critical infrastructure protection committee, some 28 members strong. And the committee is broadly representative, I think, of the industry.

From that group, we've established coordinating subcommittee to oversee the work, and I've asked Chuck Domini of Halliburton to take on the responsibility of chairing the subcommittee. Chuck, by the way, is a retired

Army lieutenant-general, one-time director of the Army staff, very much familiar with all of the key agencies at the federal level that we'll have to work with, and is full-time here in Washington. I'm confident he'll do a superb job for us.

The planning process itself will begin after the first of the year. We selected that date because of the Y2K problem. A lot of the people we want to have involved in the process from the standpoint of our industry are working the Y2K problem from the standpoint of their companies, and so we'll begin the work right after we get through January 1. A draft guidance document has been circulated for the committee members to review and has now been signed off on. There's a copy, I believe, in your handouts this morning. And I think it accurately reflects the assignment that we want the committee to address.

Let me emphasize up front we recognize there are great sensitivities involved here in terms of the importance on the one hand of

looking at potential vulnerabilities from the standpoint of the nation and the industry. But at the same time, we want to make certain that there's no infringement with respect to proprietary information. We're not interested in collecting individual company data or publishing anything like that. We do want to approach the question of risk and vulnerability assessment from the standpoint of the generic issues rather than any one specific company set of data.

One of the likely offshoots of the study may well be an effort to determine whether or not we can come up with an appropriate risk assessment model or mechanism that could then be used by individual companies on a voluntary basis to serve as a self-assessment tool for them. The subcommittee will also be asked to develop a thorough understanding of the overall federal program and critical infrastructure protection, and to coordinate with other sectors for lessons learned and for useful insights there as well.

Our dependence, increasing dependence,

as an industry on computers, on information technology on the internet, obviously also raises serious questions about the challenge of countering cyberterrorism, a problem that we'll try to address as well. In addition to coordinating subcommittee, we'll look at the need for information-sharing and analysis center for our sector and evaluate liability and legal impediments that might impede such information-sharing.

Another key part of the study will be to see if mechanisms can be established where our industry can benefit from federal law enforcement and intelligence assets. Secretary Richardson's request of the Council fits into an overall government program which calls for critical infrastructure protection programs to reach initial operating capability in 2000, and full capability no later than 2003. The time table envisioned for our response is to have a completed report for the Council for consideration this time next year, December 2000.

I expect the coordinating subcommittee first draft to be available by the committee in September. While that sounds fairly deliberate, I think there's a lot to consider, and folks with full-time jobs are obviously are going to be asked to do a lot of the work. We'll need, I think, that much time to do an effective job that we've asked them to do. The cochair of the committee from the federal government side is General Gene Harbiger. Gene is from the Department of Energy, a retired Air Force four-star with a great deal of experience in the nuclear and security business during his career in the Department of Defense. He's now the director of the Office of Security and Emergency Operations at DOE, and I would ask him to come forward and share his thoughts with us as well.

GEN. HARBIGER: Well, thanks, Mr. Secretary. I apologize for my voice. I normally don't sound like this. It's the job. Six months ago, I was fat, dumb and happy as a retired individual down in San Antonio, Texas, when I got

a phone call from Secretary Richardson. He said I want to talk to you. I'd never met the man before. I came up to Washington. We had a chat. He said Gene, I want you to be in charge of our security of our nuclear laboratories; I want you to fix it. I said hey, I can do that in a heart beat.

Well then, a month-and-a-half later, after, you know, Joe had done his thing with the critical infrastructure protection, Secretary called me back in and said hey, I'm going to give you another chore. It's National -- it's critical infrastructure protection; you're going to do that now. And about 2 weeks later, he said I don't think you're busy enough, Harbiger; you got Y2K for the Department of Energy too. So let me tell you, I'm skating fast over thin ice, and we're moving out quickly.

I got involved initially with your counterparts on the electrical side of the house, electrical energy production. And I want to compliment you. I've been to a few meetings with

the electrical folks -- and don't blow my cover and -- you know, with your buddies on the electrical side. But the meetings I go with them, they kind of talk in tongues. I can't understand what they're saying. But I'm here to tell you sitting here today, I understood virtually everything that was said. I'm prepared to take the end of session quiz when it's all over.

Let me tell you that I've done a lot of thinking, as Secretary Cheney has indicated, about terrorism and protection of our infrastructure. I first started thinking seriously about this as a colonel in National War College in 1981. And the consensus of my thoughts goes something like this. There are three things that you need to protect against. First, an act of God, and I'm sure some of you have thought a lot about that, things you have absolutely no control over: lightening strikes, tornados, that sort of thing; a malicious insider, and we got caught on this one;

terrorists, and that's the area that we're primarily going to be focusing on.

It is a very real problem. And as a matter of fact, just to show you how real it is here inside the Beltway, the number one terrorist target in the world today, ladies and gentlemen, is Washington, D.C. The FBI has just stood up a 50-person response group that's on duty 24 hours a day to respond to potential terrorist acts. I mean, this is just not because of Y2K; this is 365 days a year. On any given day in Washington, D.C., there are from three to six suspicious parcels or bags or vehicles that are met with by this emergency response team.

And I don't need to go over the litany of the terrorist attacks that have occurred over the past just 6 years. But, you know, just a few: the World Trade Center, February 5, 1993, six killed, 1000 injured; Oklahoma City, almost 170 killed, 500 injured; the subway attack in Tokyo, 19 killed, 5500 injured. And we had our first no-kidding international cyberterrorism

event that occurred in August 1997 when the Black Tiger terrorist group conducted a massive terrorist cyber attack against the Sri Lankan embassies all over the world.

We in the government look at the critical infrastructure from a paradigm that looks at you from three -- looks at us from three tiers. Tier 1 is the national security systems, the kinds of things I was worried about in my last job as commander of chief of our nation's nuclear forces. Tier 2 is the federal government in its entirety. And I will tell you that for fiscal year 2000, the government is spending $1.5 billion for critical infrastructure protection.

And Tier 3, that's you, the private sector; by far, the largest. And as the Secretary pointed out, there are a number of different sectors here: energy, transportation, information technology, banking and finances, and services. And I'll be very candid with you, the energy and transportation are the two that are lagging the other three sectors. Your concerns

are no big surprises to me, and I've got a lot of feedback in talking to various people in the electrical side of the house and to some of you on the petroleum side.

Your concerns, customer trust, protection of proprietary information, as the Secretary just pointed out, encryption and key management technology, insider threats, secure remote access, theft of services data or resources, legal issues. My commitment to you is to work with Secretary Cheney to pull this all together and to make sure we do what's right for the country and your industry.

I've got a Ph.D., Paula Scalingi, Dr. Paula Scalingi, who's going to be the cochair of the subcommittee with Chuck Domini, and we're going to be working very, very carefully and closely with you over the coming year. And I look forward to working with Secretary Cheney in preparing your industry to cope with these very real threats that are out there today. Thank you, sir.

(Applause)

CHAIRMAN FOSTER: Does anyone have any questions for Gene or Dick about this critical infrastructure study? Yes, Dan?

A PARTICIPANT: I've got a (Indiscernible) question of General Harbiger. We only have 15 days to go. Do you want to say anything about your views on Y2K and the energy industry right now?

GEN. HARBIGER: Well, let me tell you since I'm in charge of the Y2K thing, my changeover to the new millennium is going to be in the underground command center at the Forestall (ph) Building on Constitution Avenue. My wife has told me she's going to have a good time; I know I'm not. Let me tell you that I do not see a problem with Y2K-related issues. I think you're going to see some major hiccups. The first country that'll go through Y2K will be New Zealand and the far eastern part of Russia.

I think you'll see some minor hiccups as we go through that period from the first

countries going by Y2K at 6 o'clock Eastern Standard Time on the 31st until the last, America Samoa, goes through about 6 o'clock in the morning on the 1st of January. What concerns me is a terrorist group using the Y2K platform, if you will, to make a very bold statement. And that, I think, is the highest probability of threat that we'll see.

For example, the Washington, D.C., police department, 3500 people strong, has canceled all leaves and put everybody on a 12-hour work shift for the 27th of December until about the 10th of January. And I think that's the biggest threat we will face.

CHAIRMAN FOSTER: Other questions of Gene or Dick?

(No response)

CHAIRMAN FOSTER: Thank you very much. It sounds to me like we've got the right people and a good plan to deal with this issue, and we appreciate your help, Dick and Gene.

Last night, at a meeting we had, Bob

Gee, who's the Assistant Secretary of Energy for Fossil Energy, made some cogent comments about how we might talk to people outside the energy business or the petroleum business about this natural gas study that we heard earlier. And we do a great job of talking to one another in this business. But I thought it might be worth Bob just repeating some of things he said last night which might give us a different perspective about how we talk about this.

MR. GEE: Thank you, Joe. Thank you, Joe. I want to amplify a little bit about what T.J. just said about the importance of the report, and then also what Peter just said about making sure that this report doesn't become just another report that gets put on the shelf. It's very important that the NPC communicate to the outside world the significance of this report.

And my suggestion -- I think it's also shared by T.J. as well as those of us at DOE -- is that the report be communicated not so much as one that simply advocates the traditional issues

that are communicated by the oil and gas sector, such as access, which is obviously very critical to the long-term continuity of your industry. But that the value of the report be placed in context of the role of natural gas that continues to play, and can play, in maintaining clean, reliable, affordable energy for a growing economy for the next decade, decade-and-a-half.

And that unless certain measures are taken on a near-term, immediate basis, that that role will be jeopardized and that those values, clean, reliable, affordable energy, will not be met. I think that is the important message of the report. And that's the way I think, I would prefer that, this report be communicated not only within your membership and not only for those who follow the oil and gas sector, but for the general public and to Congress to understand exactly why this report is so significant.

It is the first occasion where the industry has been able to sit down in a collective setting outside of antitrust concerns,

because you've been asked to undertake this study by the government, to give us your best evaluation of what government needs to do in partnership with the private sector to maintain natural gas as a viable significant fuel for the 21st century. And I think that the message you need to communicate is that you have a number of issues certainly that you feel are closely held that you've been advocating certainly.

But also, it implicates on a cross-cutting basis, other sectors of the economy that delve into areas that the government needs to work with closely with the private sector, such as education: where are you going to find the human resource talent to fill the gap for the declining number of petroleum engineers in your sector? Where are you going to find the additional financing, the vehicles you need to -- from the financial community to build out that 1.5 TCF of additional -- $1.5 trillion investment you're going to need for the next decade-and-a-half?

And I think those are the messages that I think would resonate not only throughout any administration through the -- an interagency working group, but also resonate in the halls of Congress and involve the American public in this very important debate. And I think that's the important message from the study. Thank you.

CHAIRMAN FOSTER: Vic Beghini, who was a long term Chair of the NPC Finance Committee, retired from his company, Marathon, on November the 1st.

And I have been -- we've been fortunate to get Ken Lay to agree to serve as our Finance Chair for the NPC. And he'll give the report for the Finance Committee. Ken?

MR. LAY: I suppose it's kind of a sign of the season, but I'm also losing my voice (Laughter). But I was thinking walking up here, that probably a lot of you in the audience have been hoping for that for a long time (Laughter).

The Finance Committee did meet this morning to review the financial status of the

council. Representatives Ernst & Young, our independent outside auditors, were at the meeting, and they reviewed the audit report, or we did, for the calendar year 1998.

Based on this review, I'm pleased to report that Ernst & Young gave us a clean report. And then these are -- became a lot more important for associations like ours in this city, as of the last couple years or so.

Our accounting procedures and controls received high marks, and the financial condition of the counsel is strong.

We also reviewed calendar year 1999 expenditures and receipts, including projection for the rest of the year. Indeed, even including the three studies that you heard about today, we will spend about $3.6 million this year. But we will come in a little bit below our budget for a slight surplus.

We then, of course, discussed the proposed budget for next year, and we recommend approval of a budget of about $2.9 million next year. So of

course, somewhat lower than this year, with less steady activity.

The Finance Committee does not recommend, though, however, that we fully fund next year's budget from membership contributions in year 2000.

As certainly some of you will recall, we reduced contributions or dues 20% last year, and 10% the year before, and made up the difference out of our contingency fund.

But of course, to keep doing that, we very quickly will run out of the contingency fund. So, we recommend that in fact, with the industry now somewhat more stable than it was the last couple of years, that we restore that 20% reduction that we did a couple of years ago, which will mean the dues will still be about 10% below where they were in 1996.

And with that, we'll be requesting about $2.4 million from the membership. And of course, to make up the difference out of the contingency fund.

We think this fairly modest increase certainly is justified, and hopefully, will not have

any significant impact on our membership.

Finally, we recommend that Ernst & Young be re-appointed as our independent outside auditors for calendar year 2000. And with that, Mr. Chairman, I would -- this completes my report. And I'd recommend adoption of it.

CHAIRMAN FOSTER: Do I hear a second?

A PARTICIPANT: Second.

CHAIRMAN FOSTER: Any questions or discussion?

(No response heard.)

CHAIRMAN FOSTER: Those in favor of the motion indicate by saying aye.

GROUP: Aye.

CHAIRMAN FOSTER: Opposed, no?

(No response heard.)

CHAIRMAN FOSTER: Motion carries. Thank you, Ken. Good report. The next committee we'll hear from is the Nominating committee.

As many of you know, Carlos Chandler, who we memorialized earlier, served as Chairman of that committee for 13 years. And we wanted to find

someone to succeed him that we felt would be around for awhile.

And we figured Ray Hunt was not likely to get merged or sold out of the job (Laughter). And we figured that he could get most people to return his phone calls. And those are the kind of guys you want as the Chairman of the Nominating committee. (Laughter) So, Ray?

MR. HUNT: Thank you, Mr. Chairman. The way I figured, this is the most dangerous spot of the program. I'm the only thing standing between this group and lunch. (Laughter)

The Nominating Committee met yesterday, and our charge is to present at this meeting, our nominations for the Chair and Vice Chair of the NPC, members of the Agenda Committee and its Chairman, members of the Appointment Committee and its Chairman, and five at large members for the co-chair's coordinating committee. And Mr. Chairman, I would suggest that you should do this in one motion.

After a very spirited and contested primary for NPC Chair, the committee, nevertheless,

nominates Archie Dunham to serve this next year as Chair. Bill Wise as Vice Chair.

For the Agenda Committee, we would propose Bob Allison, Dick Cheney, Dick Farman, Bob Fri, Larry Fuller, Ray Hunt, John Miller, Lee Raymond, Rich Richard, and Dan Yergin as members of the Agenda Committee, with Larry Nichols serving as its Chair.

And for the Appointment Committee, George Alcorn, Dave Biegler, Peter Bijur, Bob Campbell, Luke Corbett, Claiborne Deming, Bobby Parker, Dick Terry, Lou Ward, Irene Wischer, with Bob Palmer serving as the Chair of the Appointment Committee.

And the at large members, five of which are proposed and elected by the membership for the co-chair's coordinating committee: We would propose Peter Bijur, Bob Campbell, Claiborne Deming, Matt Simmons and Hank Trip.

Mr. Chairman, I would put that in the form of a motion that these individuals serve in those capacities until -- well, for the balance of the year.

CHAIRMAN FOSTER: Do I hear a second to that motion?

A PARTICIPANT: Second.

CHAIRMAN FOSTER: Those in favor indicate -- well, do we have any discussion (Laughter) or nominations from the floor?

(No response heard.)

CHAIRMAN FOSTER: Those in favor indicate by saying aye.

GROUP: Aye.

CHAIRMAN FOSTER: Opposed, no?

(No response heard.)

CHAIRMAN FOSTER: Motion carries. Good work, Ray.

Well, congratulations to you for having nominated and elected an outstanding leadership in the year ahead. We've got Archie, who is the leader of an integrated, international oil company.

Bill Wise, who has a coast to coast natural gas pipeline operation with electric -- with power generation, and a little bit of E&P, as well.

Larry Nichols, Chairman of the Agenda

Committee, one of the leading publicly owned independents.

Bob Palmer, who has been around this council for many years, and who knows the service and contractor side of the business inside out. And of course, Ray Hunt and Ken Lay, serving as head of their respective committees.

So, I think the leadership of this organization is very strong, and we should be very proud that this council has that kind of leadership.

This is my last meeting as Chair of the council. And it's one I've certainly looked forward to, I'd have to say.

But on the other hand, I want to say that it's been a great privilege and a great pleasure to serve as Chairman of the National Petroleum Council.

I've been involved in counsel activities for a number of years, and I've served on a number of committees as a participant. And I have to say, one of the things that I admire the most about the National Petroleum Council is the objectivity with which it approaches issues.

It really is true that when we get involved in a joint study with the DOE or government representatives, that most of us in the industry sort of check our company hats at the door.

And we really analyze issues with an effort to see what's best for the country and what's best for the industry. And company viewpoints and industry segment viewpoints sort of get set aside.

And as a result of that, I think the NPC has created a set of reports that represent not only great references, but address current issues very well. And I think you have seen that today with this natural gas study that we heard.

And in addition to that, the NPC not only is objective, but I think that the process is almost as important as the product, as these reports are generated.

And I think that the people that worked on that gas study would tell you that the relationships that they developed, the understanding they gained of the other parts of the business was worth at least as much as -- to them as the conclusions that

they arrived at.

And I think certainly, that 1992 gas study had process as one of its real benefits. I think a lot of communication began to take place in the industry, the gas industry, to make it more market sensitive as a result of the process that that NPC group went through at that time. And I think it is continuing.

So, it's the objectivity and the process that I think are very important about the NPC. We can fill a role that no advocacy organization really can.

And we need to continue to adhere to our principles as a -- playing it straight and honest and doing the most objective job we can.

I also want to say just a word of thanks to the NPC staff. To Marshall Nichols and John and Andy and Pam, who have been very helpful to me.

Marshall, I think, is a consummate facilitator. In some organizations, the Executive Director might tend to manipulate the membership. But Marshall basically tries to make it easy for the

leadership and the membership to do their jobs effectively.

And I think he does the same thing with respect to these study groups. And so, I'm very appreciative of the support the NPC staff has provided.

So, it's been a great pleasure for me to serve here. And I thank you very much for the opportunity. And I'd like to ask Archie Dunham, the incoming Chair, to say a few words at this time.

(Applause)

MR. DUNHAM: Thank you, Joe. I just want you to know that Ray Hunt does not serve on the Conoco (ph.) compensation committee (Laughter). But I'm lobbying to become one of his children. (Laughter)

But I do accept this very high paying responsibility with enthusiasm and with humility. I've known Joe Foster for 20 years. First, as an exceptional executive at Teneco (ph.), on the upstream side of Teneco.

And then, in the last ten or 15 years, as

Chairman of Newfield. And he's been really one of the most successful, I think, explorers, especially in the Gulf of Mexico.

And so, it's a tremendous honor for me to follow Joe. I look forward to working with this distinguished council, and with the Secretary of Energy to enhance the energy security of our nation.

And I look forward to Joe's continuing involvement and leadership in this council. And I know we're going to have a great year. And I especially look forward to working with Marshall and the staff. So, thank you very much.

(Applause)

CHAIRMAN FOSTER: The only other thing I would have to say is that we've got a great piece of work that was done by the Natural Gas Committee. This is not an advocacy organization.

We're limited in certain things we can do in terms of publicizing and marketing and efforts like that. And I think that you, as individual members of this council, need to think about how you might utilize this work to be helpful in getting the

message out, and in seeing that some of these recommendations get applied.

So, this brings us to the end of today's meeting. Does any other -- any member have any desire to be recognized or any comments or questions at this point?

(No response heard.)

CHAIRMAN FOSTER: Before we adjourn, just let me announce that in about five minutes, following the close of this meeting, the people here at the head table will make themselves available to talk to the press, if there are any here, and have any questions.

And I would ask that when the meeting is adjourned, that any press people that want to address some questions to us, come forward.

Do I hear a motion to meeting adjourned?

A PARTICIPANT: So moved.

CHAIRMAN FOSTER: Moved and seconded. Those in favor say aye.

GROUP: Aye.

CHAIRMAN FOSTER: Meeting is adjourned. Thank you very much.

(Tape recording ended.)

CERTIFICATE OF TRANSCRIBER

I, Joseph M. Parent, Tape Transcriptionist, do hereby certify that the foregoing pages are a true and accurate transcription, made by me to the best of my ability, from a copy of a tape recording provided to Shirley Jones & Associates; that any inaudible or unintelligible tape segments are parenthetically indicated within the body of the transcript; that the proper designations of speakers were not always clear from the recording; and that I am neither counsel for, related to, nor employed by any of the parties to the action in which this proceeding took place; and, further, that I am not a relative or employee of any attorney or counsel employed by the parties thereto, nor financially or otherwise interested in the outcome of the action.

Joe Parent

JOSEPH M. PARENT, Transcriber

CERTIFICATE OF TRANSCRIBER

I, Connie Jones, , Tape Transcriptionist, do hereby certify that the foregoing pages are a true and accurate transcription, made by me to the best of my ability, from a copy of a tape recording provided to Shirley Jones & Associates; that any inaudible or unintelligible tape segments are parenthetically indicated within the body of the transcript; that the proper designations of speakers were not always clear from the recording; and that I am neither counsel for, related to, nor employed by any of the parties to the action in which this proceeding took place; and, further, that I am not a relative or employee of any attorney or counsel employed by the parties thereto, nor financially or otherwise interested in the outcome of the action.

Connie Jones

CONNIE JONES, Transcriber

CERTIFICATE OF TRANSCRIBER

I, NAME HERE, Tape Transcriptionist, do hereby certify that the foregoing pages are a true and accurate transcription, made by me to the best of my ability, from a copy of a tape recording provided to Shirley Jones & Associates; that any inaudible or unintelligible tape segments are parenthetically indicated within the body of the transcript; that the proper designations of speakers were not always clear from the recording; and that I am neither counsel for, related to, nor employed by any of the parties to the action in which this proceeding took place; and, further, that I am not a relative or employee of any attorney or counsel employed by the parties thereto, nor financially or otherwise interested in the outcome of the action.

Jill Wilson

JILL WILSON, Transcriber