Panel Session 3.4 Questions and Answers

Introduction by Charles M. Zeh: We are going to take a couple of minutes to get the four presenters to move up and have a seat here. If you have filled out a question card, there will be people walking through to collect them. Please pass these to the center isles. And just a piece of information for you all. Dan Kincaid and Abbie Layne alluded to it this morning — people saying, "Well, let's hold on for the ride" (with respect to the stock market). The stock market at least has not gone down today. It's gone back up, so hopefully the ride will be pleasant. The Dow Jones is at 7500 today and it's up 330 points. We will see how this relates to all this advanced technology — that is, we will see where we end up when the ride is over. The other interesting note that I had on the stock market was that the volume was 1.2 million shares. It has been an active day. Now, let me go through and pull out some of these questions.

Question: We know what the ATS program emission goals are. How are the current advanced machines meeting the goals? Based on new operating experience, what difficulties do the panel members foresee and what kind of recommendations do they have from an environmental standpoint? How is the current technology proving out, and how do see that going into the advanced technologies?

Response: With both of our F machines, we are meeting our contractual commitment of NO_X levels. But we have had problems with the dry low-NO_X system in terms of stability. I heard in one of the discussions today that this is a root issue. It is not just in the F-class machines, we've had this problem in other machines. We are at the vortex of the envelope of operation when you run these low NO_X systems. In fact, one thing that I did not talk about to cut time out is something we see affecting other combustion technologies: the catalytic converter becoming extinct. But, you cannot burn in air at any higher temperature than 2,750 °F and keep your NO_X levels down. And the stability issue still has to be addressed. I think could get it down two levels. Again, we are meeting our requirements, but we still need some kind of monitoring for the stability issues of combustion.

Question: Barry, since you have the mike, I will read the next question, which goes to you. In the United Kingdom, is anybody building for 3-MW distributed generation, which has been suggested to the United States? Or is the focus on large, embedded generation?

Response: I think that when National Power was looking at its cogeneration market, the company thought that it might be a good idea to move down to the, shall we say, less that 10-MW or less than 5-MW markets. However, to justify this, we need to look at our market. The concentrated generation business forms essentially the better part of our generation business. The other reason for not getting involved in this form of all systems is that there are many small companies in the U.K. market who are more equipped for that sort of small system. So yes, there are small systems around our big generators.

Question: This one talks about the industrial perspective, which I think is from Dan Kincaid's talk. Why is on-site generation considered a reliable benefit versus utility supply? And

why is one generator considered less reliable than an entire fleet? What's the trend? Why do people seem to be heading in that direction?

Response: I think it is because of a number of things. Some isolated incidences where an individual grid has been affected by one small problem, like a tree falling on a line, expands into major problems. I think that makes nice news, but is not the real reason. But it brings to the forefront what people are saying: how can I depend on a grid staying in operation if it gets cut out that way. Another part has to do with power quality type issues. This is a different story, having to do with a lot of lost money when power goes out or when power goes outside of a certain range of operation. People are looking at those type issues as the reason that they would like to have a substitute power from the industrial customer's perspective. Another point was mentioned by Paul Bautista: the situation when you have growth in a particular area. Then, you have environmental questions on adding transmission capabilities to serve a particular area. More and more of the public utility commissions are looking at the question of power supply from this perspective. We are saying look at something other than the traditional supply source when you are adding to transmission capabilities.

Question: Current plant staffing trends are in number of people and education level. I'll ask your thought on that. ATS, with steam cooling and complexity, means what type of staff? How do you look at using these advanced technologies under the current pressures in terms of staffing?

Response: We are less and less involved in the maintenance business and more and more involved in the operation side. We are training staff in everything that concerns operations. However, we are looking in many cases to contract out these services. So what we typically look for is: hire the person, who is directed by a technical expert, who is usually someone with 5 to 8 experience in OEM original equipment manufacturer. Because the expert has the fleet knowledge, he also has the design knowledge. Thus, the staffing trend you see is not going to have an impact on us.

Response no. 2: We play to the three pieces: (1) we provide the technical support; (2) we buy the labor for the least price possible, and (3) we buy the expert knowledge from OEM to simply supervise the technical aspects. Chuck, I think are wise in saying that industry stations have demonstrated a reduced desire to achieve World Best Practices. But I think National Power's perspective is that we can afford to go through that process. Maybe it is because National's policy is to look at business operation in terms of a large international power producer. Added value, in our case, does not correspond with a cost reduction through reducing staff numbers. Our personnel will increase in order to maintain that level of confidence. If you look at fuel costs, I suppose that fuel costs about 60 percent of the total plant costs. Other than these costs only about 15 percent of the costs are of concern, but this 15 percent is critical. If you are really looking for cost savings, don't think about stock reduction.

Question: Although we are enjoying the high thermal efficiency of the EPNH technology machines, how much room have we left ourselves when it comes to fuel flexibility?

Response: When it comes to the point long-term durability for fuel, we promised that the $25,000 level can only be achieved with the highest possible purity fuel, which is natural gas. Even no. 1 fuel oil has a lot more impurities than natural gas. So, I could see that you can use an alternate fuel for a short period of time. But our machines are basically designed to operate on all natural gas. If anything else is used, I think their life-cycle might be quite short.

Response 2: I think fuel flexibility is addressed really on a fleet basis, or looking at your mix of units. As I said, gas gets a certain price. Florida Power & Light will essentially sell the gas. We will do a minimum burn on the gas turbines because we have a supply contract with a fixed price on the delivery of gas. We can burn at that minimum level and we can turn the machines off and run other plants within our fleets that can burn no. 6 fuel oil. Our nuclear plants stay at base-load as do our coal plants. So I think that where our fuel diversity comes in is there has to be a mix of all generation assets. If you did nothing but have a fleet of combustion turbines for your fleet, you would certainly be at risk with respect to fuel diversity. I know that we have some independent power producers in our portfolio now, and they are essentially stand-alone businesses with one unit. They make a lot of money from their capacity during the periods when you are not selling energy.

Response 3: I think fuel flexibility is strategically very important. I think National Power has a privileged position in the U.K. market. We have a mix of natural gas, oil, coal, and wind energy. Think in terms of the refinery concept that I mentioned in my talk: the ability to burn not only natural gas, but also the black fuel that is built into the refinery. This gives you maximum flexibility.

Question: Who will implement the gas turbine under distributed generation, specifically looking at operation under 100 MW? Who will be able to afford to do this? Are these too small for utilities to use with a 20- to 40-year payback? Energy service companies and IPPs may not be willing to wait that long for cost recovery. How do you overcome the financing issues to see these new technologies implemented? How do you deal with the long payback problem and get new technologies in?

Response: Others involved in the supply of electricity probably have done that. There are a lot of issues on the table right now from the Federal Government and from individual state government. We don't know where things are going to go in half of the states in the U.S. We don't know where interest rates are going. We don't know where things will be going from the industrial perspective. But I think we do know is that any time there is uncertainty, somebody in the market is going to make a lot of money. And that somebody will be the somebody who decides to take the risk to provide packages to the industrial users who are not concerned with making money on electric generation, but who are concerned about making money on the product that they manufactured.

Chuck Zeh: I will now open the floor for any more possible questions. Remember that we have been here for a long time today, and many people are anxious to go.

Question: I want to ask more about the market assessments where you showed the

potential for either distributed generation or for specific cogeneration.

Response: This potential was for distributed generation, but distributed generation includes cogeneration.

Question: Were those just estimates for technical capability, or were they based on some assumed pricing?

Response: What we were talking about was the slide that showed the five sectors. I think the slide was titled "The Technical Potential for Distributed Generation" in those five sectors. If you start from there, and put what we have discussed here as one restraint, the second restraint would be that some people say that within the next 5 to 10 years, the realistic potential for these new advanced turbine systems is 10 percent.