

SCIENTIFIC REVIEW COMMITTEE MEETING

May 27, 2004

MEETING HIGHLIGHTS

SRC Members

Todd Wong (by phone)	Nahid Zoueshtiagh (by phone)
Stan Romelczyk (by phone)	Greg Adams
Katy Wolf	Gary Rubenstein
Hal Taback	Karl Lany
William Dennison	Steve Simons
Martin Ledwitz (absent)	Ted Guth
Anoosheh Mostafaei	Russell Greenhouse (absent)
Philip Hodgets	Ronald Wilkness (absent)
Ron Joseph (absent)	

Attendees

Duc Tran (by phone)	Bob Rayford
Gabe Trinidad	Mark Abramowitz
Noel Muyco	Jim Michael
Martin Schlageter	James Westbrook
Mario Leos	Nick Detor
Jerry Kraim	Anthony Prietto
Don Davis	Richard Cartwright
Kevin Duggan	Eric Wong
Shiva Subramanya	Rich Rosowski
Frank Gonzales	Damon Erickson
Steve Jamison	Dave Williams

Attendees (Continued)

Linda Arsenault	Glenn Kaneko
Stephen Torres	Matt Layton
Lance Green	David Hatfield
Mike Wellman	Stephen Percy
Keith Davidson	Ralph H. Dorr
Henry Mak	Dennis Acton
Rick Cole	Glenn Asher
Paul McGuire	Tim French
S. Chaterjee	Victor Aguilar
Lee Wallace	Tod O'Conner
Leslie Witherspoon	Dave Keefer
Sarjib Mukherji	Don Slaff
John-Paul Nepote	Bob Sorensen
Nick Laurel	George Wiltsee
Herb Nock	R.S. Brent
Shirley Rivera	Erin Sheey
Chuck Solt (by phone)	

AQMD Staff

Marty Kay	Alfonso Baez
Howard Lange	William Wong

The handouts and audiotapes can be obtained through the Public Records Section of the Chief Prosecutor's Office. There may be a fee for this service.

Marty Kay welcomed the SRC members and the audience to the meeting. The topics listed below were discussed during the meeting.

- Minutes of March 25th Meeting
- Responses to Comments from March 25th Meeting
- New and Updated BACT - Part B Listings
- Proposed MSBACT for Distributed Generation
- Other Business

Minutes of the March 25th Meeting

An audience member representing Solar Turbine, noting that the minutes (bottom of page 9) said that Solar is coming out with a new turbine model incorporating Xonon catalytic combustion, wanted to correct the minutes in this regard. While Solar is engaged in R&D targeted at such a product, there has been no decision to commercialize. (*Leslie Witherspoon, Solar Turbine*)

A committee member pointed out that a reference on page 7 to “AB1298” should be “SB1298”. (*Greg Adams, Los Angeles County Sanitation Districts*)

An audience member representing Catalytica Energy Systems wanted to clarify his company’s relationship with General Electric (GE) regarding incorporating Xonon combustion technology in a new GE gas turbine model. Catalytica Energy Systems has a development agreement with GE, but there has been no decision to commercialize. A committee member asked whether the product being developed is the GE-10. The audience member responded affirmatively. (*Dave Hatfield, Catalytica Energy Systems, Inc.; Bill Dennison, Dennison & Associates*)

Responses to Comments from the March 25th Meeting

AQMD staff stated that changes in the listings presented at the March 25th meeting that had been agreed upon at the meeting, as well as any agreed-upon changes in the minutes from the prior meeting, had been made. Committee and audience members were advised that they could check the listings and minutes as posted on AQMD’s web site.

Staff was to report back on the following items:

1. Regarding revisions to MSBACT for Petroleum Solvent Dry Cleaning, a committee member had suggested that the requirement for a refrigerated condenser be replaced with a requirement for an external chiller since that is what manufacturers are now supplying. Staff consulted the permitting team that handles dry cleaning and was advised that both refrigerated condensers and evaporatively cooled condensers are being allowed. Therefore, staff intends to change the guideline to allow either of those types of condenser.
2. Regarding the new Part B listing of the AES Huntington Beach utility boiler (A/N 394419), a committee member had asked whether stratification had been an issue. Staff reviewed the test report and found that stratification was evaluated and was not an issue.
3. There were many comments regarding the proposed new MSBACT guideline for distributed generation, and staff stated that those comments would be addressed later in the meeting.

(*Howard Lange, AQMD*)

New BACT Part B, Section I Listings

Boiler - Los Angeles County (A/N 405470)

This is an example of a boiler rated ≥ 20 MMBtu/hr meeting BACT without using SCR. This boiler is rated at 39 MMBtu/hr input and is one of four identical boilers operated by Los Angeles County Internal Services Department in Los Angeles. These boilers are used to backup co-generation systems during scheduled maintenance, and planned use is one day per month plus one week per year. They were classified RECLAIM Large Source based on not exceeding 90,000 therms per year input and thus avoided CEMS. However, they exceeded the 90,000 therms per year and were ordered to derate from their original rating of 42 MMBtu/hr to < 40 MMBtu/hr so they could be permanently classified as Large Source. As part of the derate, the County decided to install low-NOx combustion systems on these boilers, which are in RECLAIM. They selected a Todd Rapid Mix Burner with flue gas recirculation, which was guaranteed not to exceed 9 ppmvd NOx, corrected to 3% O₂. The boiler started up with the new burner in 2003, and source test results were very good. A Permit to Operate is expected to be issued soon. (*Howard Lange, AQMD*)

Discussion: A committee member asked whether operation was really restricted to one day per month. Staff responded that regularly scheduled operation is one day per month and one week per year but the boilers may operate more than this. The committee member asked why there is a 90,000 therms per month limit in the permit. Staff responded that this arose from a Rule 1313 requirement that a monthly limit on heat input be placed in the permit. Since there was no logical monthly limit and the permit had formerly contained an annual limit of 90,000 therms to avoid CEMS in Rule 1146 (for CO), it was decided to convert the annual limit to a monthly limit. (*Bill Dennison, Dennison & Associates; Howard Lange, AQMD*)

Process Heater, Other Process - Chevron Products (A/N 411357)

This is a hydrogen reforming furnace rated at 780 MMBtu/hr input, which is located in a refinery. It is equipped with an air preheater and heat recovery steam generator. Feedstocks are pentane, refinery gas and other refinery products or by-products. Feedstocks are mixed with steam and reformed in catalyst-loaded tubes within the furnace. Products of reforming are mainly H₂, CO and CO₂, and this reformat gas flows to a pressure-swing adsorber (PSA) where it is separated into a H₂-rich gas and a CO-rich gas (PSA gas). The PSA gas is returned to the furnace and is the main fuel used by the furnace. This hydrogen plant is being built to replace an older plant that could not meet 2.5 lb VOC per MMSCF H₂, required by Rule 1189 (c) as of 1-1-03. The new plant is required to be on line by 12-31-04. Emission limits are 5 NOx, 10 CO and 5 NH₃, all as ppmvd@3%O₂. The unit is RECLAIM Major Source and has CEMS for NOx, CO and ammonia. The ammonia CEMS is not required to be certified but must meet 20% relative accuracy on a periodic basis (frequency to be determined). The 5-10-5 limits were determined to be BACT based on other hydrogen reformers at Praxair and Air Products. The emission control technologies are low-NOx burners, SCR and oxidation catalyst. (*Howard Lange, AQMD*)

Discussion: A committee member asked whether the SCR uses aqueous ammonia. Staff responded that it would find out and add the information to the listing. The same committee member asked whether the ammonia CEMS was an actual analyzer or an indirect measurement. Staff responded that it is to be an actual analyzer. Another committee member asked who manufactures this analyzer. Staff responded that it would try to find out. (*Bill Dennison, Dennison & Associates; Greg Adams, Los Angeles County Sanitation Districts; Howard Lange, AQMD*)

Another committee member asked whether the entire hydrogen plant is being replaced or just the furnace. Staff responded that permit documentation suggests that the entire plant is being replaced. Another committee member confirmed that the entire plant is being replaced. (*Hal Taback, HTC; Nahid Zoueshtiagh, USEPA; Howard Lange, AQMD*)

A committee member asked whether this constitutes new BACT for non-refinery process heaters. Staff responded that it does. The committee member suggested that the listing might better be placed in Section III since there has not yet been a source test. Staff responded that this is being required as BACT and therefore belongs in Section I. (*Steve Simons, Southern California Gas Co.; Howard Lange, AQMD; Marty Kay, AQMD*)

A committee member suggested that this could also be applied to refinery process heaters. Staff responded that because this type of heater is fired on PSA gas, which contains CO₂ diluent, it tends to run with lower NO_x than a refinery process heater, which is fired on refinery gas. The NO_x limit could not therefore necessarily be required of refinery heaters. Staff stated that this distinction will be clarified in the listing. (*Hal Taback, HTC; Marty Kay, AQMD*)

Updated BACT Part B, Section II Listing

I.C. Engine, Stationary, Non-Emergency – NEO California Power – Tehama County (A/N 220)

These are 16 large gas-fired engines located in Tehama County APCD that were listed in Part B in September 2003. Emission controls on these engines consist of lean-burn combustion, SCR and oxidation catalyst. The emission limits of 9 ppmvd NO_x, 25 ppmvd VOC and 10 ppmvd ammonia (all corrected to 15% O₂) set a new BACT standard for large stationary non-emergency I.C. engines (both in Part B and in Part D, MSBACT). These engines were all source tested following plant startup, and the permit requires source testing of two engines selected by the APCD each year. At the time of the original listing, the initial source test and the first annual source test had been completed. There was some concern at that time about durability of the emission control system, and staff therefore followed up and requested the results of the second annual source test, which occurred in February 2004. The most recent source test showed the two selected engines to be in compliance although the NO_x levels were close to the permit limit. However, the SCR catalyst vendor had been on site at the time of the test and had commented that the catalyst was in need of cleaning and that the NO_x levels could be controlled with more adequate margin if the catalyst were cleaned more

frequently. Staff stated that it planned to look at the 2005 source test data. (*Howard Lange, AQMD*)

Discussion: A committee member asked how many hours the engines had logged and suggested that this information be added and continue to be added each time the listing is updated with new source test information. Staff agreed to obtain this information if possible and add it to the listing. Another committee member suggested that the hours of operation should be compared to the catalyst manufacturer's recommended cleaning schedule. Staff agreed and noted that cleaning in this case probably consists only of vacuuming or blowing out accumulated particulate and that frequent cleaning may not be a problem since this is a peaking plant with a lot of down time. A committee member asked whether the ammonia BACT for this equipment category continues to be 10 ppm. Staff responded that it does. (*Gary Rubenstein, Sierra Research; Philip Hodgets, Clean Air Now; Bill Dennison, Dennison & Associates; Howard Lange, AQMD; Marty Kay, AQMD*)

Proposed Update of Part D (MSBACT) Guidelines

New MSBACT Guideline for Distributed Generation

Proposed new MSBACT guidelines for distributed generation (DG) had been discussed at the March meeting, including a white paper and cost effectiveness calculations. There had been a number of comments and questions at that meeting. Staff had refined the white paper and cost effectiveness calculations to account for those comments plus additional and improved information that it had gathered. A revised white paper and cost effectiveness calculation spreadsheet were included in the meeting materials.

Staff began this segment with a presentation providing additional background and definition about DG and the proposed MSBACT guidelines. (*Marty Kay, AQMD*)

Discussion: There were a number of comments and questions during and after the presentation.

A committee member pointed out that wind based DG is now entering the scene. (*Philip Hodgets, Clean Air Now*)

An audience member asked whether the proposed DG MSBACT would apply to DG plants fueled from gasifiers operating on wood waste, etc. Staff responded that these would be treated separately. (*Audience Member; Marty Kay, AQMD*)

An audience member asked for a definition of stranded natural gas and asked whether pipeline quality would be defined as having heat content of 970 to 1150 Btu/scf. Staff responded that gas outside this range would be one type of stranded natural gas and that there were other types such as gas that was too far from a pipeline and gas that was too small in quantity to merit processing to pipeline quality. A committee member added that the Southern California Gas Company will not accept natural gas that is outside its minimum/maximum Btu specifications. (*Audience Member; Marty Kay, AQMD; Steve Simons, Southern California Gas Co.*)

An audience member asked whether AQMD had researched definitions of DG used by other branches and agencies of state government. Staff responded that although there may be many definitions, it is necessary to select only one. *(Todd O'Conner, Consultant; Marty Kay, AQMD)*

An audience member commented that line losses should be considered in comparing emissions of DG plants versus central station power plants. *(Audience Member)*

There was a discussion of the extent to which DG projects generally are subject to emission monitoring. It was agreed that projects larger than 1 MW, and engines larger than 1000 hp require CEMS, and committee members pointed out that lately DG projects are being required to have periodic emissions checks using portable monitors. A committee member stated that DG emissions could be better controlled by requiring more portable monitor checks and less source testing. *(Steve Simons, Southern California Gas Co.; Karl Lany, SCEC; Paul McGuire, General Electric Co.; Greg Adams, Los Angeles County Sanitation Districts)*

There was discussion of the emission characteristics of grid power displaced by DG. A committee member suggested that DG displaces in-basin generation, which has emissions that are higher than the CARB 2007 DG emission standards. Another committee member stated that it is difficult to determine what emissions are associated with grid power in view of the many power sources contributing to the grid. A third committee member felt that even if DG is compared to in-basin generation, the average emissions of in-basin power plants are now probably similar to the 2007 standards. Staff stated that the correct comparison is between DG and the 2007 standards because DG is an alternative to building new central station power plants and the 2007 standards are based on emission limits normally required of new central station power plants. *(Steve Simons, Southern California Gas Co.; Bill Dennison, Dennison & Associates; Gary Rubenstein, Sierra Research; Marty Kay, AQMD)*

An audience member suggested that staff look into a program in the State Treasurer's Office that supports clean DG. Staff responded that it would be interested in learning more about the program. *(Todd O'Conner, Consultant; Marty Kay, AQMD)*

A committee member commented that energy use avoidance should also be considered in the analysis (e.g., design of facilities for lower electricity and/or fuel requirements). Staff responded that energy use avoidance is a worthwhile goal but would be difficult to include in an analysis of DG alternatives. *(Philip Hodgets, Clean Air Now; Marty Kay, AQMD)*

An audience member pointed out that the CARB 2007 DG emission standards are subject to an evaluation to be completed in 2005. Staff responded that it is aware of this evaluation and will be monitoring it. *(Audience Member; Marty Kay, AQMD)*

A committee member asked whether AQMD had done modeling to show whether the proposed DG MSBACT guidelines would result in meeting AQMD's air quality goals. Staff responded that that type of analysis is not appropriate in a BACT determination. *(Hal Taback, HTC; Marty Kay, AQMD)*

An audience member stated that the emission characteristics of the proposed BACT technologies that were assumed in the analysis are not representative of real world

performance because DG plants typically do not operate at steady full load. Staff responded that it was staff's understanding that optimal conditions for a DG installation are that it serve a base load and that DG plants can be and generally are designed to be base loaded. Staff added that it had considered system turndown and found the KHI technology to be still cost effective at 70% load. *(Audience Member; Marty Kay, AQMD)*

An audience member asked whether creating a technology-neutral BACT guideline would be precedent setting in AQMD. Staff responded that it is somewhat precedent setting although there are existing guidelines that specify a certain technology, which effectively rules out one or more other technologies. A committee member pointed out that at one time AQMD had "alternative basic" BACT guidelines, which did restrict the selection of the base technology. However, this practice was discontinued in the mid 1990's. Another committee member pointed out that there is always the principle of alternative equivalent BACT, which allows the applicant to select an alternative method of achieving BACT if it can be shown to be equivalent to the required method in terms of emissions. *(James Westbrook, Real Energy; Bill Dennison, Dennison & Associates; Karl Lany, SCEC)*

An audience member stated that availability of the proposed BACT technologies only in certain sizes is a problem. Staff responded that DG plants do not have to be certain sizes since they are not intended to match the facility's power need but only to displace some fraction of the grid power used by the facility. Another audience member stated that in some cases the DG plant is intended for reliability purposes, in which case it does need to match a certain power need. A committee member added that in some cases DG plants are permitted for part time operation only and that some DG plants that are intended for part-time operation have permits allowing full-time operation because of AQMD's permitting structure. *(Audience Members; Karl Lany, SCEC)*

An audience member asked whether AQMD had done the legal analysis to determine whether the proposed technology-neutral approach is legal and added that the proposed guideline seems to be basically a policy decision against I.C. engine based DG. Staff responded that the technology-neutral approach follows what is occurring at the state level. The audience member responded that AQMD should follow the state approach in its entirety, including not requiring the 2007 standards be met until 2007 and subject to the 2005 evaluation. Staff responded that since there are technologies that will meet the 2007 standards cost effectively today, there is no reason to wait. *(Tim French, Engine Manufacturers Association; Marty Kay, AQMD)*

With regard to I.C. engine development work sponsored by CEC and CARB's ICAT program, an audience member asked how soon the low-emission engines being developed are expected to be commercially available. Staff responded that this is not yet known. A committee member asked whether the durability of the technologies being developed in these programs has yet been assessed. Staff responded that this was still an unknown. Another audience member stated that one low-emission I.C. engine technology meeting the 2007 standards is available with a commercial guarantee now. *(Audience Member; Philip Hodgets, Clean Air Now; Marty Kay, AQMD; Chuck Solt, Blue Point Energy)*

A committee member commented that his reading of state law is that it requires that the cost effectiveness calculation consider cost per ton of pollutant for each pollutant whereas the method used by staff was based on the overall cost of controlling multiple pollutants. Another committee member stated that the method staff had used seemed correct. *(Steve Simons, Southern California Gas Co.; Gary Rubenstein, Sierra Research)*

Regarding the assumed costs of the fuel cell technology, a committee member asked how many cell restacks were assumed and in what years. Staff responded that the costs assumed restacking in years 3 and 8 and agreed to clarify this in the calculation notes. *(Steve Simons, Southern California Gas Co.; Marty Kay, AQMD)*

An audience member questioned the assumption that the cost of electricity would remain constant over the ten year period of the analysis. Staff responded that it is not possible to predict future changes in rates. *(Audience Member; Marty Kay, AQMD)*

A committee member questioned the assumed emissions from the uncontrolled I.C. engines in that the emissions from the larger, lean-burn, engine are higher than those of the smaller, rich-burn, engine. Staff responded that the emission figures were taken from USEPA's listing of emission factors, AP-42, and are representative of old uncontrolled engines as opposed to more modern uncontrolled engines, which actually have some built-in emission controls. The committee member responded that high uncontrolled emissions overstate the emission benefit of the lower-emitting technologies and thus may be misleading to the AQMD board. The committee member went on to say that in his opinion the cost of emission offsets should not be used as part of the cost basis to justify more stringent BACT. He added that this effort to create a DG MSBACT guideline seems to be a rationalization of BACT activity driven by what AQMD sees as a weakness in new source review policy and that the process being followed is too subjective. *(Karl Lany, SCEC; Marty Kay, AQMD)*

A committee member expressed concern that mention of out-of-basin power in the BACT analysis may be taken to mean that AQMD is embarking on a policy to discourage construction of new in-basin power plants. He also expressed concern that the BACT process may be being used inappropriately to discourage construction of new DG plants although he does not disagree with the basic objective of leveling the playing field between DG technologies and central station power plants. He expressed the following additional concerns and suggestions:

1. Part (a) of section 40440.11 of the California Health & Safety Code specifically prohibits AQMD from requiring alternative basic BACT.
2. Staff's concern that DG plants are in most cases relatively unmonitored and not required to provide emission offsets should more appropriately be addressed through rule-making than via the BACT process.
3. Some of the assumptions regarding fuel cells appear to be incorrect.
4. The KHI technology cannot be operated below 70% rating because of rapid emission increases as the load drops below this level.
5. The CPUC rebates may not belong in this cost effectiveness analysis.

6. Offset costs attributed to uncontrolled I.C. engines may not be appropriate since these engines may not be minor sources.

This committee member recommended that the MSBACT guidelines for I.C. engines and gas turbines be reviewed and updated as appropriate but that a new MSBACT Guideline for DG not be created. He recommended that other issues that need to be addressed be addressed via rule-making rather than through the BACT process. (*Gary Rubenstein, Sierra Research*)

An audience member stated that he supports the proposed new DG MSBACT guideline. (*Martin Schlageter, Coalition for Clean Air*)

An audience member commented that while it is true that most DG plants are not required to provide emission offsets, AQMD does ultimately provide offsets for all DG emissions. (*Lee Wallace, Sempra Energy Utilities*)

An audience member commented that AQMD had presented information in a CEC PIER Program workshop held in conjunction with UCI on the subject of meeting the CARB 2007 DG emission standards, and he recommended that staff review that information. Staff requested that he provide the information, and he agreed to do so. (*Audience Member; Marty Kay, AQMD*)

An audience member asked whether the proposed DG MSBACT should apply above 3 MW since the cost effectiveness calculations did not consider systems larger than 3 MW. She stated that the analysis for systems larger than 3 MW should compare the proposed new MSBACT to a conventional gas turbine based system. Staff responded that existing MSBACT for gas turbines rated at or above 3 MW does meet the 2007 standards assuming that the system would include CHP. The audience member responded that the definition of DG includes simple cycle gas turbines without CHP. Staff responded that it did not feel there was any problem in this area. Another audience member suggested that staff clarify this in the staff report. Staff agreed to do so. (*Leslie Witherspoon, Solar Turbine; Martin Schlageter, Coalition for Clean Air; Marty Kay, AQMD*)

A committee member expressed the following concerns:

1. Emissions data available for the KHI technology are only for operation at or above 98% load. The state Health & Safety Code requires that in setting new BACT, AQMD must show that the proposed emission limits have been achieved in practice at all loads at which the equipment is likely to be operated. The fact that KHI guarantees the emissions down to 70% load is not adequate, and test data are needed. Staff responded that it feels the guarantee is an adequate indication that the emission limits can be met down to 70% load.
2. The CPUC rebates should not be considered in the cost effectiveness analysis since they are real costs that have to be paid by someone. Furthermore, future availability of these rebates is uncertain.
3. The only installation of a molten carbonate fuel cell plant in this region has been at an LADWP facility, and that installation was done as a technology demonstration project with little or no consideration of cost. The cost was \$12,000 per kW. That system does not therefore represent a commercial installation and should not be used as a basis for setting BACT. A letter sent by

Barry Wallerstein to USEPA in March of 1999 commenting on proposed reform of the federal LAER process states that LAER should not be set on the basis of R&D projects where there is no consideration of cost. However, that is what AQMD seems to be doing in this case.

4. The molten carbonate fuel cells installed at LADWP have been available only 83% of the time, including 2 months down time for repair of leaks and replacement of gaskets.

(Steve Simons, Southern California Gas Co.; Marty Kay, AQMD)

A committee member commented that AQMD was renegeing on a promise made in the mid 1990's not to engage in alternative basic BACT. He referred to a supplemental document that accompanied the BACT guidelines developed at that time. A specific issue at the time had been some water companies in the mountains being forced to convert diesel pumps to electric, which would have threatened emergency capability to fight fires. In the present case, he was concerned about facilities that are staffed with personnel who are familiar with I.C. engines being forced to use turbine technology for any new DG projects. A second committee member stated his agreement with these comments and added that in presenting this to the board, staff should make it clear that this is a departure from AQMD's 1995 board-approved BACT policies. *(Greg Adams, Los Angeles County Sanitation Districts; Karl Lany, SCEC)*

A committee member suggested that the PM guideline of .045 g/bhp-hr for I.C. engines rated at or above 2064 bhp be replaced with the Clean Fuels Policy since some manufacturers will not guarantee the .045 and AQMD has on several occasions in permit-specific BACT determinations waived the .045 requirement and substituted the Clean Fuels Policy. Staff agreed to consider this suggestion. *(Karl Lany, SCEC; Marty Kay, AQMD)*

A committee member invited all to visit his home to see an example of solar DG providing full house power including powering of his electric automobile. *(Philip Hodgets, Clean Air Now)*

Audience members made the following comments:

A representative of an engine manufacturer stated that a group of engine manufacturers intend to provide AQMD with emissions data for current lean-burn I.C. engines. He then stated that he would like to see an explanation of the legal basis for the policy decision that is implicit in the proposed MSBACT. *(Eric Wong, Cummins)*

Staff should remove from the report any technology that is not supported by a substantial amount of commercial operation. The proposed MSBACT standards have been met by multiple technologies and have been demonstrated at multiple locations for multiple years. Staff should obtain data for these technologies and add them to the staff report. *(Tom Girdlestone, Emerachem)*

The Fuel Cell Energy molten carbonate fuel cell is certified by CARB to meet the 2007 DG emission standards. The product is commercially available. AB 1685 has extended CPUC incentives for DG plants through 2007. *(Stephen Torres, Fuel Cell Energy)*

Contracts have recently been awarded for 1.5 MW of commercial fuel cell power plant projects. A number of additional fuel cell power plant projects are in the contract negotiation stage. (*Jim Michael, Alliance Power*)

Fuel Cell Energy (FCE) can produce 50 MW per year of product in its factory in Connecticut and has finances available to expand production to 400 MW per year. The product available today represents 10 years of development and a \$400 million investment. A committee member asked in what years and at what cost will the stack have to be replaced. FCE responded that the 5-year service contract includes restacking and recommended that the maintenance costs be based on two successive 5-year service contracts. The committee member asked whether the 41% electrical efficiency [HHV basis] used in the calculations was correct. FCE responded that a new fuel cell power plant operates at 47% net electric efficiency [presumably LHV basis] and this figure degrades by nominally 10% over 3 to 5 years operation. FCE expects to improve the initial efficiency from 47% to 50% in the near future. Another committee member asked whether the cost of a fuel cell power plant is coming down. FCE responded that the cost has come down a lot since the LADWP project was done and the cost factor used in the cost effectiveness analysis represents the current installed cost, which is expected to decline further as the company gains experience and economies of scale. (*Herb Nock, Fuel Cell Energy; Gary Rubenstein, Sierra Research; Steve Simons, Southern California Gas Co.*)

Will AQMD consider delaying presentation of this matter to its board until the CARB evaluation of the 2007 DG emission standards is complete (approximately 6 months starting with a June 2 workshop)? Staff responded that it plans to attend or monitor the June 2 workshop and will decide after that point. (*Richard Brent, Solar Turbine; Marty Kay, AQMD*)

Engine manufacturers support the CARB program and schedule for applying more stringent emission standards to DG and view AQMD's proposed new BACT as extremely disruptive. The CPUC rebates should not be included in the cost effectiveness analysis since a cost is a cost. (*Keith Davidson, Tecogen*)

KHI is based in southern California, with nearly 500 employees in Irvine. KHI is guaranteeing 2.5 ppm NOx and 6 ppm CO down to 60% load for a project now being negotiated. (*Glenn Asher, KHI*)

AQMD should not wait for the CARB 2005 evaluation to be completed. Sufficient information is available now to make this BACT determination. (*Martin Schlageter, Coalition for Clean Air*)

The assumptions that electric and gas rates will not change over the ten year period considered in the cost effectiveness analysis is questionable and needs to be reexamined. Many businesses in southern California need DG to stay in business here. AQMD should hold off on this until it gets better information. It is hard to believe that a 250 kW fuel cell costing \$1,000,000 can be cost effective. Maintenance cost was not considered. Staff responded that maintenance cost was considered. (*Rick Cole, DTE Energy; Marty Kay, AQMD*)

If the CPUC incentive program ends after 2007 and the MSBACT is no longer cost effective at that time, what will be done? Staff responded that the incentive program may be extended again. The speaker responded that a sunset date has been set by the legislature so we do know that the program will not extend beyond 2007. (*Kevin Duggan, Capstone Turbine*)

Although the CPUC incentive program has been extended for three more years, it is not known how much funding will be available. It is expected that the funding levels will be lower than in the past. In the SoCalGas segment of the program, Level 3, which covers I.C. engines, was terminated in 2003 because the funding was used up. However, recently it was found possible to shift funds from other categories to Level 3. Another audience member stated that since funding for a given category in the program may be used up prematurely, the incentives should not be considered in the cost effectiveness analysis. The first speaker added that funds in the SoCalGas, PG&E and SDG&E segments of the program are expected to expire prematurely except in the Level 1 (zero emissions) category. (*Tony Prietto, Southern California Gas Co.*)

Some years ago, AQMD changed BACT for small boilers based on a process that had not had sufficient operating history, and that BACT determination had to later be reversed. In the present case, AQMD should wait until the low-emission technologies have matured and should require these technologies through rule-making rather than through the BACT process. What the San Joaquin Valley air district is doing in Phase 2 of Rule 4702 is a good model to follow. Facilities are being required to submit an emissions plan and inspection & monitoring plan. (*Don Slaff, Oceanside Engineering*)

Other Business

Marty Kay announced that the date of the next meeting would be July 22 and thanked all attendees for their participation.

There was no further discussion, and the meeting was closed.