

DATE ISSUED: April 3, 2001 REPORT NO: 01-063

ATTENTION: Rules, Finance and Intergovernmental Relations Committee
Agenda of April 4, 2001

SUBJECT: Electrical Generation Station on Marine Corps Air Station
(MCAS) Miramar

SUMMARY

Issue - Should the City pursue the design, construction and operation of a 50 megawatt (MW) peak shaving electrical generation plant on Marine Corps Air Station (MCAS) Miramar?

Manager's Recommendation - Support the establishment of a 50 MW peak shaving plant on MCAS Miramar property by a private developer in partnership with the United States Department of Navy.

Other Recommendations - None

Fiscal Impact - None with this action.

BACKGROUND

California is experiencing an unprecedented power crisis that has been well documented in the local and national media. In response, Congressman Duncan Hunter has proposed the formation of a municipal utility district and the siting of a 50 megawatt (MW) peak shaving electrical generation station on Marine Corps Air Station (MCAS) Miramar. Congressman Hunter met with Mayor Murphy regarding his proposals, and the matter of the MCAS Miramar peak shaving plant was referred to the City Manager for review.

DISCUSSION

Unlike commodities such as fossil fuel and water, electricity cannot be stored, so generation

must increase as demand rises during peak usage periods. As demand rises, so do the prices charged for the increasing levels of power. In anticipation of these power spikes, smaller scale power plants known as “peaking” or “peak shaving” plants can be developed to produce the smaller increments of expensive power.

Traditional peak shaving plants have been “single cycle” units that do not make use of the heat from the combustion process. They can be brought on and off line quickly and have historically been used for peak use periods on a daily or seasonal basis (i.e., noon to 7:00 p.m. during the summer months). These plants can be installed relatively quickly and at lower cost than traditional base load plants; however, they are a less efficient type of plant and consume more fuel than other options. Natural gas is normally the preferred source of fuel for such plants, but price spikes in the natural gas industry and the difficulties associated with importing additional natural gas into California have increased the importance of fuel efficiency in long term operations. It is also anticipated that due to the continuing crisis, new peaking plants would operate for longer periods of time than previous units, and function more like traditional base load plants.

Single cycle plants can also be designed as “combined cycle” plants, where the exhaust heat is captured and used to produce electricity via a steam boiler. These plants are more efficient than single cycle plants; however, they cannot be brought on and off line as quickly. A combined cycle plant would operate for longer periods of time and its economics would more closely resemble a traditional base load power plant. They also take longer to construct and are more expensive to purchase and install; however, the increased efficiency and longer operating periods results in power being produced at a lower cost per kilowatt hour than a single cycle plant.

Staff’s analysis of Congressman Hunter’s proposal was primarily focused on equipment furnished by Solar Turbines due to availability and the speed of bringing a unit on line. Solar has represented that equipment capable of producing in excess of 50 MW of power is available for delivery in approximately five months. It should be noted that there are other manufacturers and types of equipment with performance comparable to the Solar units; however, information on such units was not readily available.

FISCAL CONSIDERATIONS

According to information provided by Solar Turbines (Table 1), the proposed peaking plant would cost approximately \$25 million and the higher efficiency combined cycle plant would cost approximately \$40 million. The proposal also assumes a ten year Government Lease Financing Program, and varying costs for the fuel stock gas. Based on these assumptions, the cost advantage per Kilowatt hour (kW-hr) of the high efficiency plant is readily apparent. It should be noted these costs do not include factors such as site preparation, infrastructure installation and connections, project management and related expenses.

TABLE 1 Relative Cost/Efficiency of Single Cycle vs. Combined Cycle Plant*

	Peaking Plant	High Efficiency Plant
Nominal Capacity	52 MW	50 MW
Equipment	Ten 5.2 MW Gas Turbines (Mobile Power Units)	Three 13.5 MW Gas Turbines and One 9.5 MW Steam Turbine
Capital Cost	\$25 Million	\$40 Million
Monthly Payment Govt. Lease Fin. Program	\$254,000	\$415,000
Total Cost with \$4.00/MMBtu Gas (includes fuel, operation, maintenance, lease payment)	8.5¢ per kW-hr	5.3¢ per kW-hr
Total Cost with \$6.00/MMBtu Gas (includes fuel, operation, maintenance, lease payment)	10.1¢ per kW-hr	6.9¢ per kW-hr
Space Requirement	18,000 sq. ft.	35,000 sq. ft.

*Information provided by Solar Turbines Incorporated

Given that power plants have a productive life of over 20 years, it is essential that assumptions related to the price of fuel and power prices be carefully considered. It is anticipated the current inflated prices of natural gas and electricity will “normalize” over time, thus significantly impacting the economics of power plant operation. Over the long term, the hours of operation and the efficiency of the units directly related to the cost of fuel, will determine the financial success or failure of such an installation. It would also be advisable to finance the plant over a longer period to improve its economics.

SITING

Based on a preliminary review of available information, staff has identified an area on MCAS Miramar, north of the City’s existing Miramar Landfill leasehold, that is adjacent to high voltage transmission lines and a high pressure natural gas line. The area is currently undeveloped, however it has not been evaluated for environmental or other constraints. Siting public improvements on MCAS Miramar has historically involved negotiating leaseholds and various permits. At this time staff has had no discussions with Navy or Marine personnel regarding their analysis of this proposal or timelier associated with permitting, federal and/or state environmental review or leasehold negotiations.

AIR QUALITY IMPACTS

An important aspect in evaluating alternative types of power generating units is the impacts of the units on air quality and the associated permitting issues. This evaluation did not take these

concerns into consideration due to the time frame and the lack of information immediately available on the various alternatives. Staff has heard indications that existing regulations could be modified as a result of the current situation, but these changes are considered speculative at this point. Additionally, staff is aware of concerns by the Air Pollution Control District regarding the cumulative impacts of additional fossil fuel power plants in this area.

PERMITTING PROCESS

On February 8, 2001, Governor Davis issued Executive Order D-26-01 directing the California Energy Commission to streamline the permitting process for new peaking power generation plants that can be on-line in 2001. The emergency permitting process would license such plants in 21 days after determining the application was complete. However, this would not apply to all aspects of permitting a peaking power plant on MCAS Miramar because federal requirements under the National Environmental Protection Act (NEPA) would not be waived by a state emergency order and the permitting process would be significantly longer than for a comparable facility on non-federal property.

CONCLUSION

Installation of a 50 MW power plant on MCAS Miramar property is technically feasible, subject to a number of considerations. Placement of a peaker plant on MCAS Miramar would require federal environmental review, lease negotiations and assessments by MCAS Miramar regarding the compatibility of the proposed project with their mission of national defense. A private firm familiar with power plant development and operation, in partnership with the Department of Navy, could best evaluate this proposal, and if feasible, construct and operate it in the most appropriate manner.

ALTERNATIVE

Direct the City Manager to enter into negotiations with the Department of Navy to design, construct and operate a 50 MW peak shaving plant on MCAS Miramar. This is not recommended due to the City's lack of experience in power plant construction and operation and the uncertainty of the level of support for the project by MCAS Miramar.

Respectfully submitted,

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Approved: George I. Loveland
Senior Deputy City Manager

LOVELAND/RAE/RJF