Miller, Felicia@Energy

From: Jerry.Salamy@CH2M.com
Sent: Friday, July 12, 2013 1:46 PM
To: Miller, Felicia@Energy
Cc: Robert.Mason@CH2M.com; Bell, Kevin W@Energy; mafoster@stoel.com; stephen.okane@AES.com; John.Kistle@AES.com
Subject: RE: Cheng Cycle technology

California Energy Commission
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Felicia,

AES considered but rejected the Cheng cycle technology for its repower projects due to the fact this technology would not feasibly attain most project objectives while avoiding or substantially lessening the impacts of the projects (CEQA Guidelines section 15126.6(a), (c).). A brief summary of these objectives are: the use of a reliable and predictable generation technology, compliance with SCAQMD Rule 1304(a)(2), reuse of existing infrastructure, and minimize environmental impacts. The Cheng cycle involves the injection of steam into the turbine combustion system that increases wear on combustion components, reducing component reliability while increasing maintenance costs. The Cheng cycle is not consistent with SCAQMD Rule 1304(a)(2) megawatt to megawatt offset exemption and therefore not a feasible generation technology for the repower projects as there are not enough publicly available PM10 Emission Reduction Credits to permit a gas turbine project greater than 20-50 MW regardless of the cost of the credits of the kind of gas turbine plant considered (Cheng cycle, simple cycle, CCGT). Rule 1304(a)(2) or a legislative action to allow access to the SCAQMD offset bank are the only viable air quality permitting paths for a thermal power plant in the SCAQMD jurisdiction. The Cheng cycle would require more water as water is consumed, not reused as with AES's repower projects, which increases impacts on water resources and possibly requiring an additional water supply linear. The Cheng cycle design does not avoid or substantially lessen project impacts. The Cheng cycle would consume a significant amount of water as this technology does not use a traditional heat recovery steam generator, like HBEP, but generates steam for the sole purpose of injecting that steam into the combustion turbine. Once the steam is injected into the turbine, it is released to the atmosphere along with the combustion exhaust gases as opposed to the HBEP design that reuses the steam (water) once it passes through the steam turbine and is condensed in the ACC. Cheng cycle water consumption is comparable to wet cooled CCGT technology. Injecting the steam into the power turbine would also increase the exhaust stack moisture content and would result in visible moisture plumes from the HBEP exhaust stacks, resulting in a visual impact not currently envisioned from HBEP as designed.

Please let me know if you have any additional questions.

Jerry Salamy
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From: Miller, Felicia@Energy [mailto:Felicia.Miller@energy.ca.gov]
Sent: Friday, July 12, 2013 11:01 AM
To: Salamy, Jerry/SAC
Cc: Mason, Robert/SCO; Bell, Kevin W@Energy
Subject: Cheng Cycle technology

Hi Jerry,

Could you please provide staff with information related to the Cheng cycle generator? Staff is exploring alternative generation technologies and like to know why AES did not pursue implementing this technology on their 3 power plants. Although there are a number of sites in California utilizing this technology, staff would like to know whether commercial application of this technology is feasible or not feasible and why or why not.

Thanks for your assistance, Felicia

FELICIA MILLER - PROJECT MANAGER

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