

GPA 2013 IRP Teleconference on 6/12/2013 Summary of Points and Data to be Provided

Lummus Consultants would like to understand the economic and environmental implications of an Alternative “Compliance” Case based on the following three changes in assumptions.

- 1.) Instead of adding Flue-Gas Desulfurization (FGD) at Cabras Units 1 and 2, add only Electrostatic Precipitators (ESP).
 - Lummus Consultants would like to understand the economic and environmental impacts of replacing FGDs at Cabras Units 1 and 2 with ESPs.
 - The logic for replacing the FGDs with ESPs is based on our assessment of documents prepared by TRC Environmental related to air dispersion modeling for this area. We believe the implementation of Guam Power Authority’s (GPA) Reciprocating Internal Combustion Engine - Maximum Achievable Control Technology (RICE MACT) compliance plans at the Cabras/Piti complex will likely result in SO₂ reductions sufficient to meet 1 hour SO₂ National Ambient Air Quality Standards (NAAQS) without any additional SO₂ reductions from Cabras Units 1 and 2, thus eliminating the need for FGDs at these units.
 - EPA’s schedule for State Implementation Plan (SIP) revisions for areas determined to be non-attainment has been extended to as late as 2022 which affords an opportunity to fully assess the need for additional SO₂ reductions before committing to FGDs at Cabras Units 1 and 2
- 2.) Tanguisson - derate the units down to 25 MW.
 - Lummus Consultants believes a small reduction in capacity to be the least-cost option to avoid electric generating unit (EGU) MACT compliance costs at Tanguisson.
 - 1. For the slow-speed diesels, Cabras Units 3 and 4 and Piti Units 8 and 9, change the fuel to low-sulfur diesel with the addition of the oxidation catalyst (include the cost of conversion and assume fuel can be made available).
 - In recent weeks, GPA presented an alternative to EPA to negotiate an extension. GPA indicated these slow speed diesels are not designed to burn low viscosity fuel without modifications and switching to low sulfur diesel doesn’t remove the requirements for an oxygen catalyst.
 - GPA indicated the cost of low sulfur diesel fuel is approximately 1.8 times more than residual fuel oil (RFO), and that they don’t have adequate storage facilities for a different type of fuel. GPA would have difficulty procuring the quantities of low sulfur diesel fuel needed to run the slow speed diesels at Cabras and Piti.
 - Lummus notes that the Integrated Resource Plan (IRP) doesn’t address some of these constraints and GPA agrees.
 - The basis for Lummus Consultants’ suggestion for including the use of low sulfur diesel plus oxidation catalyst in an Alternate Compliance Case is based on information contained in the GPA Environmental Strategic Plan Addenda (dated, February 2013) included with the IRP. The summary table in the Addenda lists two compliance options, other than an EPA exemption or LNG conversion, for the RICE

MACT rule:(1) use low sulfur diesel and install an oxidation catalyst; and,(2) lower sulfur RFO plus FGD and oxidation catalyst. In the summary table,Option 1 lists an annual cost increase of \$73 M/yr and no capital cost increase; Option 2 lists an annual cost increase of \$58 M/yr plus \$409 M in capital costs. Based on these reported costs and the risks of installing FGD on sites with limited space, we suggest Option 1 for EPA compliance.

- At a minimum, GPA will provide more detail on their consideration of these options and their associated constraints as it relates to the logic for including FGD systems for RICE MACT in the IRP's Base Case.

Additional Cases for Consideration

Discussion centered on the extent to which the 34,000 MMBtu/day LNG consumption minimum was a predetermined constraint and how it may have influenced the IRP results. What would be the optimal plan if the minimum was removed?

- GPA noted that in order to attract a developer there were constraints that needed to be assumed. Also, if the LNG volume was too small, there would be lost economies of scale.
- GPA noted there were optimization plans that came up with less than 34,000 MMBtu/day but the constraint was applied after the optimizations were run.
- GPA determines what the cost premium would be if under 34,000 MMBtu/day.
- GPA indicated no cases were thrown out; they were just re-ranked. Lummus Consultants has the Excel spreadsheet that shows a summary view all of the cases. GPA to provide more specific information explaining how the 34,000 MMBtu/day level was determined and what if any implications it had on selecting as optimal plan.

Lummus Consultants suggested the LNG study that forms the basis for GPA's IRP recommendations should be updated to reflect the current state of pricing, availability and transport technology of LNG.

Reliability Improvements

Lummus Consultants is concerned that the IRP does not adequately address what improvements are being made on Guam with respect to T&D. Lummus Consultants is aware of the GPA's Smart Grid Initiatives, but there is not a plan that ties everything together for the PUC.

- GPA's planning cycle goes from the IRP to the long-range transmission planning, which is a two-year cycle. The results are folded-in and then incorporate a more granular level of detail. GPA does not sufficient staff to complete both the IRP and transmission plan simultaneously.
- The IRP is a building block to additional studies that GPA performs on an ongoing basis.
- GPA may re-evaluate the expansion plan; the need for this is based on current uncertainty in underlying assumptions (e.g. a military build-up; more retirements).

Diversity and Renewables

The IRP does not address one of its stated major goals - increased generation diversity. Lummus Consultants believes the IRP,as filed, essentially moves from a reliance on oil to a dependence on LNG. Lummus Consultants suggests more emphasis is needed in the IRP on what GPA is doing to improve the T&D system's ability to integrate renewables in the future as a means of increasing diversity.

- GPA indicated that there are limitations to integrating renewables into the transmission grid; capacity is sufficient but the intermittent nature of some renewable technologies causes grid stability concerns.

- GPA indicated that their combustion turbines have improved system response as compared to their slow-speed diesels.
- GPA agreed that the IRP, as filed, has a significant reliance on LNG, but they point out that not ALL generators are proposed to burn LNG; GPA's small peaking and reserve generators will still burn oil and provide a minimal amount of diversity.
- GPA feels that fuel oil is more susceptible to large price spikes.
- Lummus Consultants suggested GPA expand the IRP's discussion of renewables and diversity to better reflect their strategic direction in this very important area.

Financial and Rate Impacts

The financial considerations of incorporating increased amounts of LNG in GPA's fuel supply mix have a major impact on ratepayers, which Lummus Consultants does not feel has been adequately addressed in the IRP.

- GPA agreed that the IRP does not address the plan's effect on ratepayers.
- GPA agreed to add an update to the IRP to better demonstrate the effect on ratepayers, which they agreed to provide to Lummus Consultants for review prior to filing with Commission.
- GPA agreed to provide capital costs broken down by unit for all cases in the IRP. To the degree the information has already been provided, GPA agreed to work with Lummus Consultants to indicate where that information is located.
- GPA agreed to provide a breakdown of the annual NPV of fuel as well as non-fuel expenses.
- GPA will show where the actual cash flows are occurring.
- GPA committed to setting up a separate meeting to review all financial data used to support the IRP's development.

Construction, Operation and Maintenance of Generation Resources

How does GPA intend to do the work (i.e. will GPA own and operate the LNG system, with GPA issue an RFP)?

- GPA indicated that there are a number of policy decisions that have yet to be fully developed. Efforts to date have focused on developing options.