Comment 1. One aspect of this PIC (and others reviewed to date) is the question of how much sampling is enough. One means for providing statistical support to this determination is "power analysis." This approach takes into consideration how much is known about the variability of the parameter being assessed and offers a defensible strategy for establishing an appropriate sample size. Too few samples means one is unable to detect an effect, even if it is profound, too many and one is wasting resources. The PIC proposes sample numbers and sampling frequency without providing supporting material that those numbers and frequencies have the ability to detect significant differences. Public domain software for power analysis is available, but the method requires an understanding of statistical sampling design. In any event, proposed sample numbers and frequencies need to be justified for reasonable assurance that they have the ability to meet the needs of the project.

Response 2. Based on our review, we find that power analysis is a tool for taming the sampling error potential to a defined rate when sampling a population of known variability. While there is usually historical impingement and entrainment data to draw on, the variability in the number of fish and shellfish that are subject to becoming impinged and entrained over time can be significant. Diurnal, seasonal, and inter-annual variability is expected in complex estuarine systems that are influenced by numerous, largely unpredictable, ambient and regional environmental factors, e.g. red tide, hurricane activity, the strength of the previous year's young fish and shellfish populations, etc. In addition, plant operational factors, driven by weather and other variables, will change flow and other conditions that will, in turn, effect the population subject to impingement and entrainment. Power analysis requires a robust estimate of the current population conditions in order to define a precise sample size. For the reasons stated, this data is not available for our facilities. It's instructive that while we know of at least one instance where a consultant has employed power analysis, we found that this could only be done after developing hypothetical population data sets based on that consultant's experience. The sampling frequency selected for this characterization study is based on review of the historical sampling data by qualified individuals so that the objectives of the rule are fulfilled. We find that power analysis is neither suitable nor necessary for this effort.

Comment 2. The PIC discusses the use of various existing structures, procedures, operational controls, etc. for credit in reducing baseline impingement mortality and/or entrainment. Please note that the definition of Calculation Baseline in 40 CFR Part 125.93 states that such credit can only be obtained if the structures or activities were "implemented in whole or in part for the purpose of reducing impingement mortality or entrainment." Therefore, in order to claim such credit, a Permittee must demonstrate that the regulatory requirement is met.

Response 3. The location of the intake at Plant Scholz is believed to play a role in reducing baseline impingement mortality. Plant Scholz is located at the end of a narrow intake canal that is at a right angle to the swiftly moving river. The channelized canal provides poor fish habitat, thus we suspect that any impingement which may occur does so at lower levels than would occur if the intake were sited in the open

river. MACTEC will evaluate the difference between the main river near Plant Scholz and the intake canal via quarterly electroshocking. For each quarterly electroshocking event, 4 to 6 ten minute transects will be sampled in various locations in both the intake canal and the main river. We believe this will show reduction in baseline impingement mortality. Further clarification is needed on how the Permittee can demonstrate this in order to meet the regulatory requirement.

Comment 3. Regarding sampling locations, Section 5.2.3.2 the PIC calls for bi-weekly impingement sampling events at the intake structure. The plant description (Section1.1) states that there are two generators and four intake pumps, each with its own set of traveling screens. It is not clear whether sampling will include only one traveling screen, or all four sets together, or all four sets independently.

Response 4. Sampling events will include all four sets of traveling screens being sampled concurrently.

Comment 4. Sample Frequency: Samples will be collected from the traveling screen wash discharge for a 24 hour period with impinged organisms removed every day. Eight additional sample events (twice per season) will be collected to evaluate diel variability. It should also be feasible to empty the baskets twice a day, in the morning and evening. This would have the added benefit of eliminating the need for the eight additional diel sample events. The sampling program could be further improved by adding one collection per month, which would provided three replicates per month. This sampling design would be more "powerful" in the statistical sense, providing: - 3 days x 12 months = 36 sample events vs. 2 days per month x 12 months = 24 + 8 diel sample events = 32 total sample events.

Response 5. Diel samples will not be in addition to the biweekly sampling, but will occur at the same time as biweekly sampling with the basket being emptied after approximately 12 hours. Diel (12 hour and 24 hour) samples will be taken twice per season for a total of eight events per year. The first quarter of impingment sampling at Plant Scholz yielded low levels of impingement (see attached Table 1.) Diel variability is not likely to be significant.

Comment 5. Many of the references provided in the PIC are very general nature and don't cover intake structures or power plant operations. The following four items should be discussed referenced and listed in Appendix A:

Comment 5.a. Section 1.2, paragraph 2 and Section 3.1 paragraph 1 – the reference to a 1970 316(b) study;

Response 5.a. The study that is being referred to is Breedlove and Associates, Undated. A 316(b) Demonstration for the Scholz Electric Generating Center, Sneads, Florida. Prepared for Gulf Power Company. 63 pp. + Appendices. The reference for this study is in Appendix A of the PIC.

Comment 5.b. Section 2.1 effects of the configuration of the intake and intake canal on IM, (this would be a good place to have some of the plant's data),

Response 5.b. Table 1 (attached) shows data for the first quarter of impingement data collection at Plant Scholz. Impingement levels have been low, we believe due to the configuration of the intake canal.

Comment 5.c. Section 5.2.3.1 reference to existing data in Section 2.2 – Section 2.2 makes no reference to existing data;

Response 5.c. Section 5.2.3.1 of the PIC refers to discussion in Section 2.2 of "existing data that may be used to evaluate and describe the condition of the existing fishery in the Apalachicola River. These data include historical information that date back to the 1970's and 1980's along with more recent information." Section 2.2 indicates that a Gulf Power has initiated the literature review portion of the project. Appendix A contains references to studies with existing data.

Comment 5.d. Section 5.2.5.2. - the formula for adjusted calculation baseline. How much evidence is there for this relationship between shocked fish and IM?

Response 5.d. Fish shocked in the canal should provide an estimate of the number and types of fish that may possibly be impinged. Sampling via electroshocking in the main river will also show the number of fish that would possibly be impinged if the plant had been located on the main river rather than the intake canal.

Comment 6. In addition to converting CPUE data to IM data in order to document the value of the configuration of the intake canal, a literature review should be undertaken to determine the possible effects of intake configuration on fish impingement rates. Additionally, shocking for one hour, may shock the entire canal, which may bias the sample if the location within the canal is not taken into account, i.e. referencing at least "near the intake" or "the area of influence" or "near the confluence with the river" or "outside the area of influence". A better approach might be to shock each area for a shorter time period, (for example 10 – 15 minutes) and repeat the activity three to five times per sampling. This would give a better estimate of the fish populations in each area.

Response 6. The PIC proposes 60 minute sampling events for shocking the canal and river. This would be broken down into 10-minute transects at various locations within the canal and near-river environments. Transect locations would be recorded (using GPS and description of habitat) along with fish collection data.

Comment 7. A summary of the results of Gulf Power's existing investigations would be useful. The authors make several statements throughout the PIC for which supporting documentation is not provided. For example, the discussion in Section 2.1 describing the poorer habitat of the canal vs. the river, without supporting documentation. There may be available studies with such data, but none are presented.

Response 7. Studies have shown that channelized sections of rivers exhibit lower species diversity than nearby rivers (Tarplee et al., 1971). Tarplee et al. (1971) found that fish biomass in a channelized stream was lower than in an unchannelized stream and that a reduction in macro-invertebrate biomass had occurred. These differences between natural waters and associated canals can be attributed to lower habitat diversity in canal systems. The shallows and deeps which characterize natural rivers and contribute significantly to their diversity of habitats and species, are not present in irrigation canals. Bankside and littoral vegetation is often different than in a natural river and benthic fauna can be reduced (Aliyev, 1976).

Comment 8. If a restoration project is proposed (Compliance Alternative 2,) how will its effectiveness be measured (e.g. an increase in numbers, biomass, or CPUE)? The measure of success of a restoration project would be an increase in the existing stocks great enough to replace those lost to IM, as evaluated by an appropriately designed monitoring program.

Response 8. MACTEC is currently conducting field work to collect data for the calculation baseline. It is unknown at this time if there will be a need to pursue restoration effort credit. Specific projects and results will be further discussed if Gulf Power proposes to pursue restoration effort credit as a compliance alternative.

Comment 9. The PIC discusses several IM&E technologies but does not discuss their merits or indicate which technologies may be preferred at this time.

Response 9. MACTEC is currently conducting field work to collect data for the calculation baseline. It is unknown at this time what the preferred technologies may be for Plant Scholz. Specific technologies and their merits will be further discussed once all data has been gathered.

TABLE 1

Impingement Sampling 5/3/2005 through 7/26/2005

Plant Scholz

Gulf Power Company

Fish Common Name	Other Biota Common Name	Total Number Collected	Total Weight Collected (g)	Total Weight Collected (lbs)
Black crappie		3	29	0.06
Blacktail shiner		2	33	0.07
Bluegill		25	238.6	0.53
Centrarchid		1	3	0.01
Gar		1	4	0.01
Gizzard shad		2	483	1.06
Hogchoker		67	128.4	0.28
Largemouth bass		1	2	<0.01
Redbreast sunfish		1	21	0.05
Shiner-Notropis sp.		2	1	<0.01
Threadfin shad		19	400	0.88
White catfish		6	66	0.15
	Corbicula	1	8	0.02
	Crayfish	7	25	0.06
	Shrimp	2	1	<0.01

Prepared By: JMD
10/24/05

Notes:

g = grams

lbs = pounds