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GULF POWER
A SOUTHERN COMPANY

November 1, 2007

Ms. Ann Cole, Commission Clerk
Florida Public Service Commission
2540 Shumard Oak Boulevard
Tallahassee FL 32399-0850

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Dear Ms. Cole:

Enclosed for official filing in Docket No. 070299-EI are an original and seven copies of Gulf Power Company's Post-Hearing Brief and Statement of Issues and Positions, pursuant to Order No. PSC-07-0796-PHO-EI.

Sincerely,

Susan D. Ritenour

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Enclosures

cc w/encl: Beggs & Lane
Jeffrey A. Stone, Esq.

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BEFORE THE FLORIDA PUBLIC SERVICE COMMISSION

In re: Review of 2007 Electric Infrastructure Storm Hardening Plan filed pursuant to Rule 25-6.0342, F.A.C., submitted by Gulf Power Company

Docket No. 070299-EI

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BRIEF OF GULF POWER COMPANY

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Dated: November 2, 2007

BEFORE THE FLORIDA PUBLIC SERVICE COMMISSION

In re: Review of 2007 Electric Infrastructure Storm Hardening Plan filed pursuant to Rule 25-6.0342, F.A.C., submitted by Gulf Power Company	)	Docket No. 070299-EI Date Filed: November 2, 2007

POST-HEARING BRIEF AND STATEMENT OF ISSUES AND POSITIONS OF GULF POWER COMPANY

Gulf Power Company, ("Gulf Power", "Gulf", or "the Company"), by and through its undersigned attorneys, files the following as its post-hearing brief and post-hearing Statement of Issues and Positions in this proceeding pursuant to Order No. PSC-07-0796-PHO-EI and Rule 28-106.215, Florida Administrative Code (F.A.C.).

GENERAL DISCUSSION

STORM HARDENING PLAN DEVELOPMENT

Gulf Power Company's Storm Hardening Plan (also referred to as "Plan"), as amended, which includes the 10-Point Preparedness Plan Initiatives (Ten-Part Initiatives) that were approved by the Commission in Order Nos. PSC-06-0781-PAA-EI and PSC-06-0947-PAA-EI, can reasonably be expected to enhance the reliability and reduce restoration cost and outage times in a cost-effective manner. [Tr. 88, 103] By adopting Grade B construction standards on all new and major distribution rebuilds, along with utilizing an Extreme Wind Load (EWL) pilot project approach on critical infrastructure facilities and performing underground storm hardening projects where appropriate, Gulf's Storm Hardening Plan is prudent, practical, and cost-effective. [Tr. 103-04] The storm hardening plan before the Commission in this docket is Gulf's first storm hardening plan. [Tr. 88] This plan will be updated as additional data becomes

available. [Tr. 94, 102, 107]

For the years 2007 through 2009, Gulf estimates that the total cost of storm hardening will be approximately $20 million per year. [Tr. 101] This results in a cost on a per-customer basis of $46. *Id.* The incremental storm hardening activities have a retail revenue requirement of approximately $8.3 million, which would equate to $0.28 for the cost of 1,000 kWh to a residential customer. [Tr. 102] The storm hardening activities proposed in Gulf's Storm Hardening Plan are likely to result in some mitigation of storm damage and resulting customer outages. *Id.* Preliminary estimates of the possible benefits of Gulf's transition from Grade C to Grade B construction standards and the EWL pilot projects indicate that these activities are cost-effective, though it cannot be determined at this time just how much of a positive impact these activities will have on storm restoration or customer outages. [Tr.102, Plan at 28, Exhibit 45] Gulf is not able to perform an exact cost and benefit analysis since it lacks the storm impact and cost data that is necessary to determine potential costs and benefits of a particular storm hardening activity. [Tr. 93, 97, 99, 102] Gulf appropriately utilized its field observations from Hurricanes Ivan and Dennis, which impacted Gulf's service area in 2004 and 2005 respectively, along with available data and made assumptions regarding future storm frequency and intensity to determine a range of possible benefits for these parts of its storm hardening plan. [Tr. 93, 99, 110] These field observations are recent, firsthand observations of the impacts of hurricanes that directly impacted Gulf Power's service area but are not based on a study of forensic data. [Tr. 93] The level of detail necessary to constitute forensic data sufficient to allow analysis for potential storm hardening benefits is not available with regard to Gulf Power's storm restoration efforts related to Hurricanes Ivan and Dennis and prior storms. [Tr. 93, 121, 504]

Prior to the storm seasons of 2004 and 2005, the focus of Gulf's storm damage data

collection efforts was to ensure proper accounting through the Company's property insurance reserve. This data was collected in broad categories, not into subsets differentiating costs by what caused the damage or by distribution facility type. [Tr. 93, 138, 140-42, Exhibit 48] Until the utilities filed their Ten-Part Initiatives in Docket 060198-EI, there was no requirement for utilities to collect data at a level sufficient for them to identify the exact cause of damage to a distribution facility by a hurricane or identify specific costs for the damaged distribution facilities. [Tr. 88-9, 505, 531-32] Moreover, a review of the storm hardening plans filed by the utilities reveals that none of the utilities have such data at this time. Contrary to the position taken by Panama City Beach and the Municipal Underground Utilities Consortium (hereafter referred to as "PCB"), existing data does not provide the necessary details from which the potential benefits of undergrounding as a storm hardening activity can be determined. [Tr. 120-21, 532-33] Simply knowing the number of poles or the amount of wire used in a restoration effort does not provide sufficient information for determining whether a storm hardening activity is or will be effective from a cost and performance standpoint. Likewise, PCB witness Rant inappropriately compares SAIDI, SAIFI, and CAIDI data from Panama City Beach and Pensacola without accounting for differences in geography, storm patterns, vegetation, and age of facilities. [Tr. 512] The appropriate evaluation would be of data for overhead and underground facilities within the same city. *Id.*

On an ongoing basis as part of the Ten-Part Initiatives and its Storm Hardening Plan, Gulf will be collecting forensic data differentiating damage by cause and by type of distribution facility. [Tr. 512, 514, 531-33] In addition, Gulf will be collecting outage data differentiating between overhead and underground distribution facilities. [Tr. 512, 531-32, Plan page 15] Gulf will also review industry efforts related to storm hardening such as the undergrounding research

being performed by the Public Utility Research Center (PURC). [Tr. 507, 512, Plan at 17]

EXTREME WIND LOAD CONSTRUCTION STANDARDS

Gulf relied on its many years of storm restoration experience in determining how to cost-effectively meet the requirements of Rules 25-6.0341 and 25-6.0342, F.A.C., which address extreme wind load construction standards. [Tr. 93, 96] While several hurricanes have affected Gulf's service area over the past 15 years, Gulf appropriately relied on field observations of the impacts on distribution facilities from two recent hurricanes, Hurricane Ivan in 2004 and Hurricane Dennis in 2005. [Tr. 93] Hurricane Ivan made landfall just west of Pensacola Beach. The eye of Hurricane Dennis came ashore approximately 15 miles from Pensacola Beach on Santa Rosa Island between Navarre Beach and Gulf Breeze, which is nearly 80 miles from Panama City Beach. [Tr. 516, Exhibit 18 at Schedule 8, Exhibit 35 at pages 2-3] These two hurricanes provide Gulf-specific information regarding the impacts of hurricane-force winds in Gulf's service area. [Tr. 93, 96] The field observations of the impacts on distribution facilities of Hurricanes Ivan and Dennis strongly indicate that pole failures in Gulf's service area were not the result of wind-only impacts during hurricanes, but rather from the impacts of wind-carried debris and from off right-of-way trees falling into distribution facilities. [Tr.93, 97] Given that Gulf's recent firsthand experience is that wind-blown debris, not just wind-alone impacts, is the predominant cause of damage to distribution facilities in hurricanes and that the cost to adopt EWL for all of Gulf's distribution facilities is approximately $437 million, Gulf determined that it was prudent to approach EWL standards through targeted pilot projects focusing on critical infrastructure and interstate crossings and to not adopt EWL standards for all of its distribution facilities. [Tr.96, 98-9] As part of its Storm Hardening Plan, Gulf proposes to adopt EWL standards as specified by Figure 250-2(d) of the 2007 National Electric Safety Code (NESC) for

certain of its critical infrastructure in the 2007 through 2009 time period. The proposed EWL projects are identified in Schedule 10 of Exhibit 18 as well as in Sections 5.0 and 9.1 of Gulf's Storm Hardening Plan. [Tr. 98] The types of facilities to be targeted with EWL projects were identified using input from county emergency operation centers. *Id.* This input helped Gulf to define critical infrastructure as feeders which serve critical loads such as hospitals, major sewage treatment plants and fuel depots. *Id.* Distribution crossings over Interstates 10 and 110 are also considered critical infrastructure. *Id.*

As part of its EWL pilot project, Gulf is installing wind monitoring devices close to the individual EWL projects. *Id.* These devices should enable Gulf to gather valuable data to assist in the determination of the effectiveness of the EWL projects. The use of targeted pilot EWL projects is a proactive and prudent attempt to address EWL standards in Gulf's service area. These targeted pilot projects will allow Gulf to collect information and better evaluate the effectiveness of EWL standards in the context of storm hardening. *Id.*

Along with Gulf's pilot EWL projects, Gulf is adopting Grade B construction standards for new construction, major expansions, rebuilds, and relocations of distribution facilities. [Tr. 94] As discussed previously, Gulf's field experience strongly supports that pole failures on its system during hurricanes are not the result of wind-only impacts. [Tr. 93, 97] Despite this, Gulf's adoption of Grade B construction for new construction, major expansions, rebuilds, and relocations of distribution facilities is prudent given the cost to implement Grade B construction and the potential for positive storm hardening benefits. Based on historical hurricane data, Gulf's move to Grade B construction with its "equivalent wind" load rating of 118 MPH will strengthen Gulf's distribution system to address approximately 80% of the storms likely to impact Gulf's service area. [Tr. 96-7] In addition, Gulf will be able to compare the effectiveness

of Grade B construction in future hurricanes to the effectiveness of Grade C construction. [Tr. 97]

The adoption of Grade B construction for new construction, major expansions, rebuilds, and relocations of distribution facilities coupled with the pilot EWL projects targeting critical infrastructure is a prudent, cost-effective means to address the extreme wind loading standards specified by Figure 250-2(d) of the 2007 edition of the NESC. Adoption of EWL standards over and above Grade B standards is not prudent at this time. [Tr. 99] The adoption of EWL throughout Gulf's service area would result in significant costs to Gulf and its customers without a corresponding benefit that is likely to be greater than that which is potentially achievable through the adoption of Grade B construction alone at a much lower cost. *Id.*

UNDERGROUND AS A STORM HARDENING ACTIVITY

In developing its storm hardening plan, Gulf adequately considered undergrounding as a storm hardening activity and determined that, at this time, undergrounding was not a prudent storm hardening activity. [Tr.504-05] In its analysis of undergrounding as a storm hardening activity, Gulf considered whether undergrounding was cost-effective and whether undergrounding resulted in reduced customer outages and restoration times both in the aftermath of a storm and on a day-to-day basis. [Tr. 505] The result of Gulf's analysis is that undergrounding should not be adopted as a storm hardening activity at this time. [Tr. 505-06] Instead, Gulf recommends that as part of its continuing look at storm damage mitigation techniques in general, specific techniques related to underground distribution facilities should be undertaken on a pilot basis. [Tr. 506]

The first step in Gulf Power's analysis of undergrounding was to look at cost. PCB witness Rant agrees that the utility, in this case Gulf Power, would be in the best position to

know the conditions found on its system and how they relate to the installation costs of underground. [Tr. 485] Gulf has determined that the cost of undergrounding as a storm hardening activity is extremely high. [Tr. 505-06, 513] The cost impact of converting Gulf's existing overhead systems to underground in just three targeted areas, Pensacola, Fort Walton Beach and Panama City Beach, is estimated to be a staggering $780 million. [Tr. 513] To put this number in proper context, the $780 million amounts to 150% of Gulf's current total system net distribution investment. [Tr. 513-14] This only represents an estimate of the initial installation cost and does not consider the likelihood of unknown subsurface obstacles encountered at the time of installation which would almost certainly lead to additional cost. [Tr. 485] It is undisputed that underground distribution costs more than overhead at the time of initial installation. [Tr. 505] In addition to this initial higher cost, Gulf Power has firsthand experience with the destruction of underground distribution facilities caused by storm surge and sand infiltration from Hurricanes Opal, Ivan and Dennis. Gulf's experience is that the cost to restore underground facilities after a storm is higher than that to restore overhead facilities. [Tr. 93-4, 139-40, 506] Witness Rant on behalf of PCB agrees that replacing underground facilities that are destroyed by a storm surge is more expensive and takes longer than repairing overhead facilities in the same location. [Tr. 440] A review of Exhibit 18, Schedule 3, shows that much of the population in Gulf Power's service area is located along coastal areas.

The second part of Gulf's analysis of undergrounding was a determination of the potential benefits of undergrounding as a storm hardening activity. Gulf adequately analyzed the potential benefits of undergrounding as a storm hardening activity. [Tr. 93, 504] The key question to be answered in this proceeding is whether undergrounding results in reduced customer outages and restoration times in the aftermath of a storm and on a day-to-day basis

such that undergrounding may provide benefits to offset the extreme costs associated with undergrounding as a storm hardening activity. [Tr. 505] Gulf's experiences with underground facilities on a day-to-day operational basis and during Hurricanes Opal, Ivan and Dennis indicate that undergrounding has limitations as a storm hardening activity both during storm events and on a day-to-day basis. [Tr. 505-06]

The main benefit of undergrounding as a storm hardening activity touted by PCB and other proponents of undergrounding is the idea that customers served by underground facilities experience fewer outages during storm events, which equates to reduced storm restoration costs. [Tr. 435, 437] This potential benefit appears to be premised on the idea that underground facilities are not damaged by hurricane winds and wind-blown debris in a storm, and that if the underground facilities are intact then the underground crews can be sent to restore service in areas served by overhead. [Tr. 438] The foregoing view is overly simplistic and is contradicted by PCB witness Rant. First, on Gulf Power's system, nearly all of Gulf's underground distribution facilities are fed from overhead distribution facilities. [Tr. 481] Therefore, the effects of wind and wind-blown debris still impact customers ultimately served by underground distribution facilities. Hardening the overhead facilities that feed the underground facilities would be extremely costly as discussed above. Moreover, Mr. Rant's claim that the underground facilities will be undamaged and intact after a storm event is incorrect as discussed below. However, even assuming that Mr. Rant is correct, his own testimony is contradictory. He first testified that in his opinion utilities realize significant additional benefits in the storm restoration environment through undergrounding, because they do not need to deploy restoration crews to the areas served by underground facilities, which would then free those crews up to restore areas served by overhead facilities. [Tr. 438] He then contradicts himself by correctly pointing out

that the overhead and underground crews are not interchangeable. [Tr. 452] Overhead crews and underground crews are different from one another and have specific tools and equipment for their respective types of work. Therefore, underground crews are not freed up to restore overhead facilities. PCB's underlying premise regarding the benefits of undergrounding is simply not supported by the facts.

Another premise offered by PCB is that underground distribution facilities are not damaged during storm events. [Tr. 435] This is clearly not correct. In fact, Gulf has seen its underground distribution system repeatedly damaged by hurricanes. [Exhibit 39 at Schedule 1, Exhibit 4 at Item 16] Gulf is not speculating as to the damage caused by direct storm impacts as do Mr. Rant and Mr. Willoughby. Mr. Willoughby relies solely on his utility's experiences with hurricanes that made landfall ranging from 86 miles to 159 miles from his utility. [Tr. 509-10] Mr. Rant relies on his experience with one tropical storm. [Tr. 508] Neither Mr. Rant nor Mr. Willoughby make any comparison of Northwest Florida to any of the regions of the country which they claim serve as an example for storm hardening. Gulf's experience is from the direct impacts of two recent hurricanes, Ivan and Dennis, in 2004 and 2005 respectively. Hurricane Opal caused similar damage just over a decade ago to Pensacola Beach. [Tr. 93, 96, 519, Exhibit 39 at Schedule 1 and Exhibit 4, Document 1, Item 16] The extreme and widespread damage caused by these hurricanes on Gulf Power's underground distribution system is shown through a vivid pictorial history in the testimony of Mr. Battaglia in this proceeding. [Exhibit 39 at Schedule 1 and Exhibit 4, Document 1, Item 16] This damage was from storm surge and the salt water and fine sand slurry that infiltrate the distribution facilities in its path. [Tr. 508] Many areas suffered a complete washout of Gulf's underground distribution facilities. [Exhibit 39 at Schedule 1] Again, in discussing his storm restoration experience, Mr. Willoughby does not

mention having any actual hurricane restoration experience, but offers an opinion that washouts are unusual. [Tr. 472] He offers no evidence that it is true in Gulf Power's service area. Again, he makes no comparison of Gulf Power's service area to the service area upon which he bases his opinion. [Tr. 509] Likewise, Mr. Rant offers no evidence that he is familiar with the specifics of Gulf Power's service area and provides no factual basis for his opinion regarding the survivability of underground systems in a storm event. [Tr. 509] Moreover, the pictures in Exhibit 39, Schedule 1 show more than just areas of complete washout. In many instances, all of the underground distribution system was destroyed. [Exhibit 39 at Schedule 1] Piles of sand and debris, as well as examples of the destruction to switch gear and underground cable are shown throughout the pictorial history for the various storms. [Exhibit 39 at Schedule 1] Even a cursory look at the pictures would reveal that finding and repairing the damage to the underground distribution facilities after a storm event results in longer outages. [Tr. 505-06] The Commission has a policy requiring the utilities to install distribution facilities in a manner that considers the need to facilitate safe and efficient access to those distribution facilities. [Rule 25-6.0341, F.A.C.] Installing underground distribution facilities in areas that are subject to being covered by sand or debris during and after a storm event impedes the goals of Rule 25-6.0341, F.A.C. In the areas shown in the pictures where underground distribution facilities were destroyed or severely damaged, if Gulf had loop feeds in the same area, one can easily infer that they would also have been destroyed or severely damaged, which would have resulted in Gulf Power having to rebuild even more underground facilities at a cost higher than that to construct overhead facilities. [Tr. 506] Based on the foregoing, the correct conclusion is that underground facilities are susceptible to damage in storm situations. Therefore, replacing overhead facilities with underground facilities just substitutes the need to repair or replace damaged overhead

facilities with the need to replace or repair more costly underground facilities.

As discussed above, undergrounding does not appear to have identifiable and quantifiable benefits from a storm hardening standpoint at this time. In order to have a complete analysis of undergrounding, Gulf also looked at the day-to-day impact of undergrounding to determine any potential benefits that may offset the extreme costs associated with undergrounding. [Tr. 505] Gulf's experience indicates that the day-to-day operation and maintenance (O&M) cost of underground distribution facilities is greater than that of overhead distribution facilities. [Tr. 94, 505] Gulf is collecting additional detailed information on the differences in O&M between overhead and underground distribution facilities as set forth in its Ten-Part Initiatives. [Tr. 507] This more detailed information will help Gulf better define the true cost of operating and maintaining underground and overhead distribution facilities. Moreover, finding and repairing problems on an underground system takes longer and costs more than for comparable overhead facilities. [Tr. 505-06] Given that the preference in Rule 25-6.0341, F.A.C. is for underground distribution facilities to be installed in front of a customer's premise, any trenching or boring during installation, maintenance or repair must take place in the customer's front yard or in the right-of-way in front of a customer's home. PCB witness Willoughby correctly points out that aspects of installing underground facilities is disruptive to the customer's property. [Tr. 484] Witness Willoughby also claims that there is a public safety benefit associated with undergrounding. [Tr. 440] He appears to base this claim on an idea that there is less exposure to the utility from vehicles hitting distribution poles because there are fewer distribution poles. *Id.* This completely ignores the fact that underground distribution has components that are above ground and that these facilities have a far larger footprint than a distribution pole. [Exhibit 39, Schedule 1, at page 2] Based on the foregoing, undergrounding as a storm hardening activity has

no identifiable day-to-day benefits sufficient to offset the extreme costs associated with installing, operating, maintaining or repairing underground distribution facilities. In fact, the available information suggests that undergrounding results in additional costs on a day-to-day basis.

Gulf's analysis of the overall potential benefits of undergrounding as a storm hardening activity does not show that undergrounding has benefits that outweigh the extreme costs associated with undergrounding. The decision to convert overhead distribution facilities to underground is a customer choice. [Tr. 130-31] The Commission's policy is that the entity requesting underground distribution facilities instead of overhead distribution facilities pays the difference in cost between the two types of facilities. [Rule 25-6.078, F.A.C.] Nothing in the record of this docket supports discounting this differential as a result of potential storm restoration benefits. Any discount in the differential would result in all of Gulf's customers subsidizing underground facilities that traditionally have been paid for by the entity requesting their installation.

Finally, Gulf's Storm Hardening Plan appropriately focuses on finding ways to mitigate damage to underground facilities during storm events. [Tr. 506] Gulf is piloting several storm damage mitigation techniques as they relate to underground facilities. [Tr. 100, 505-06 and Plan at Appendices 5 and 6] For example, Gulf is piloting the use of heavy lids and anchoring systems on flush-mounted switch gear and below-grade gear. *Id.* Mr. Rant apparently agrees with Gulf's pilot underground projects, but jumps to an unfounded conclusion that the techniques will definitely work and will have positive storm benefits that can be quantified now. [Tr. 441] While Gulf believes that these pilot projects have high potential to work in some instances, Gulf does not have any factual evidence to support how effective they will be in future storm events.

[Tr. 134-35] The storm damage mitigation techniques have not yet been tested by a storm event. *Id.* Further, Gulf is collecting O&M data related to underground and overhead distribution facilities as part of its Ten-Part Initiatives. [Tr. 507] In addition, Gulf has a process in place to collect storm data, to perform a forensic analysis of that storm data, and to collect outage data differentiating between overhead and underground systems. *Id.* Gulf is also participating in collaborative storm hardening research through the PURC. These efforts will enable Gulf to continue to study and to refine its storm hardening activities as they relate to undergrounding and EWL standards. *Id.*

CONCLUSION

Gulf Power Company's Storm Hardening Plan, which includes the Ten-Part Initiatives that were approved by the Commission in Order Nos. PSC-06-0781-PAA-EI and PSC-06-0947-PAA-EI, can reasonably be expected to enhance reliability and reduce restoration cost and outage times in a cost-effective manner. By adopting Grade B construction standards on all new construction, major expansions, rebuilds, and relocations of distribution facilities, along with utilizing an Extreme Wind Load pilot project approach on critical infrastructure facilities and performing underground storm hardening projects where appropriate, Gulf's Storm Hardening Plan is prudent, practical, and cost-effective. [Tr. 103-04]

DISCUSSION OF SPECIFIC ISSUES[1]:

ISSUE 27: Does the Company's Plan address the extent to which, at a minimum, the Plan complies with the National Electric Safety Code (ANSI C-2) [NESC] that is applicable pursuant to subsection 25-6.0345(2), F.A.C.?

1 The listing of issues and position summaries that follow in this section is also intended to serve as Gulf Power's post-hearing Statement of Issues and Positions required by Order No. PSC-07-0796-PHO-EI.

***

SUMMARY: **STIPULATED.** Yes. Gulf's Storm Hardening Plan exceeds the National Electric Safety Code

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ISSUE 28: Does the Company's Plan address the extent to which the extreme wind loading standards specified by Figure 250-2(d) of the 2007 edition of the NESC are adopted for new distribution facility construction?

***

SUMMARY: Yes. Gulf proposes to adopt Grade B construction standards for new construction, major expansions, rebuilds, and relocations of distribution facilities. Grade B construction addresses approximately 80% of the storms likely to impact Gulf's system. Gulf's plan includes targeted pilot Extreme Wind Loading projects focusing on critical infrastructure and major thoroughfares.

***

DISCUSSION:

Gulf relied on its many years of storm restoration experience in determining how to cost-effectively meet the requirements of Rules 25-6.0341 and 25-6.0342, F.A.C., which address extreme wind loading standards (EWL). [Tr. 93, 99, 110] While several hurricanes have affected Gulf's service area over the past 15 years, Gulf appropriately relied on field observations of the impacts on distribution facilities from two recent hurricanes, Hurricane Ivan in 2004 and Hurricane Dennis in 2005. *Id.* Hurricane Ivan made landfall just west of Pensacola Beach. [Id] The eye of Hurricane Dennis came ashore approximately 15 miles from Pensacola Beach on Santa Rosa Island between Navarre Beach and Gulf Breeze, which is nearly 80 miles from Panama City Beach. [Tr. 516, Exhibit 18 at Schedule 8, Exhibit 35 at pages 2-3] These two hurricanes provide Gulf-specific field observations regarding the impacts of hurricane-force winds in Gulf's service area. [Tr. 93, 96] The field observations of the impacts on distribution facilities of Hurricanes Ivan and Dennis strongly indicate that pole failures in Gulf's service area were not the result of wind-only impacts during hurricanes, but rather from the impacts of wind-carried debris and from off right-of-way trees falling into distribution facilities. [Tr. 93, 97]

Given that Gulf's recent firsthand experience is that wind-blown debris, not wind-only impacts, is the predominant cause of damage to distribution facilities in hurricanes and that the estimated cost to adopt EWL for all of its distribution facilities is approximately $437 million, Gulf determined that it was prudent to approach EWL standards through targeted pilot projects focusing on critical infrastructure and interstate crossings and not to adopt EWL standards for all of its distribution facilities. [Tr. 96, 98-99] As part of its Storm Hardening Plan, Gulf proposes to adopt EWL standards as specified by Figure 250-2(d) of the 2007 NESC for certain of its critical infrastructure in the 2007 through 2009 time period. The proposed EWL projects are identified in Schedule 10 of Exhibit 18 as well as in Sections 5.0 and 9.1 of Gulf's Storm Hardening Plan. [Tr. 98] The types of facilities to be targeted with EWL projects were identified using input from county emergency operation centers. *Id.* This input helped Gulf define critical infrastructure as feeders which serve critical loads such as hospitals, major sewage treatment plants and fuel depots. *Id.* Distribution crossings over Interstates 10 and 110 are also considered critical infrastructure. *Id.* As part of its EWL pilot project, Gulf is installing wind monitoring devices close to the individual EWL projects. *Id.* These devices should enable Gulf to gather valuable data to assist in the determination of the effectiveness of the EWL projects. *Id.* The use of targeted pilot projects will allow Gulf to collect information and better evaluate the effectiveness of EWL standards in the context of storm hardening. *Id.*

Along with Gulf's pilot EWL projects, Gulf is adopting Grade B construction standards for new construction, major expansions, rebuilds, and relocations of distribution facilities. [Tr. 94] As discussed previously, Gulf's field experience strongly supports that pole failures on its system during hurricanes are not the result of wind-only impacts. [Tr. 93, 97] Despite this, Gulf's adoption of Grade B construction for new construction, major expansions, rebuilds, and

relocations of distribution facilities is prudent given the annual cost of $225,000 in years 2008 and 2009 to implement Grade B construction standards and the potential for positive storm hardening benefits. Based on historical hurricane data, Gulf's move to Grade B construction standards with its "equivalent wind" load rating of 118 MPH will strengthen Gulf's distribution system to address approximately 80% of the storms likely to impact Gulf's service area. [Tr. 96-97] In addition, Gulf will be able to compare the effectiveness of Grade B construction in future hurricanes to the effectiveness of Grade C construction. [Tr. 97] The adoption of Grade B construction for new construction, major expansions, rebuilds, and relocations of distribution facilities coupled with the pilot EWL projects targeting critical infrastructure is a prudent, cost-effective means to address the extreme wind loading standards specified by Figure 250-2(d) of the 2007 edition of the NESC. Adoption of EWL standards over and above Grade B standards is not prudent at this time. [Tr. 99] The adoption of EWL throughout Gulf's service area would result in significant costs to Gulf and its customers without a corresponding benefit that is likely to be greater than that which is potentially achievable through the adoption of Grade B construction standards alone at a much lower cost. *Id.*

ISSUE 29: Does the Company's Plan address the extent to which the extreme wind loading standards specified by Figure 250-2(d) of the 2007 edition of the NESC are adopted for major planned work on the distribution system, including expansion, rebuild, or relocation of existing facilities, assigned on or after the effective date of this rule?

***

SUMMARY: Yes. Gulf proposes to adopt Grade B construction standards for new construction, major expansions, rebuilds, and relocations of distribution facilities. Grade B construction addresses approximately 80% of the storms likely to impact Gulf's system. Gulf's plan includes Extreme Wind Loading pilot projects that focus on critical infrastructure and major thoroughfares.

***

DISCUSSION:

Gulf relied on its many years of storm restoration experience in determining how to cost-effectively meet the requirements of Rules 25-6.0341 and 25-6.0342, F.A.C., which address extreme wind loading standards. [Tr. 93, 96, 110] While several hurricanes have affected Gulf's service area over the past 15 years, Gulf appropriately relied on field observations of the impacts on distribution facilities from two recent hurricanes, Hurricane Ivan in 2004 and Hurricane Dennis in 2005. [Tr. 93] Hurricane Ivan made landfall just west of Pensacola Beach as a Category 3 hurricane. The eye of Hurricane Dennis came ashore approximately 15 miles from Pensacola Beach on Santa Rosa Island between Navarre Beach and Gulf Breeze, which is nearly 80 miles from Panama City Beach. [Tr. 516, Exhibit 18 at Schedule 8, Exhibit 35 at pages 2-3] These two hurricanes provide Gulf-specific information regarding the impacts of hurricane-force winds in Gulf's service area. [Tr. 93, 96] The field observations of the impacts on distribution facilities of Hurricanes Ivan and Dennis strongly indicate that pole failures in Gulf's service area were not the result of wind-only impacts during hurricanes, but rather from the impacts of wind-carried debris and from off right-of-way trees falling into distribution facilities. [Tr. 93, 97] Given that Gulf's recent firsthand experience is that wind-blown debris, not wind-only impacts, is the predominant cause of damage to distribution facilities in hurricanes and that the estimated cost to adopt EWL for all of its distribution facilities is approximately $437 million, Gulf determined that it was prudent to approach EWL standards through targeted pilot projects focusing on critical infrastructure and interstate crossings and to not adopt EWL standards for all of its distribution facilities. [Tr. 96, 98-99] As part of its storm hardening plan, Gulf proposes to adopt EWL standards as specified by Figure 250-2(d) of the 2007 NESC for certain of its critical infrastructure in the 2007 through 2009 time period. [Tr. 98] The proposed EWL projects are

identified in Schedule 10 of Exhibit 18, as well as in Sections 5.0 and 9.1 of Gulf's Storm Hardening Plan. *Id.* The types of facilities to be targeted with EWL projects were identified using input from county emergency operation centers. *Id.* This input helped Gulf define critical infrastructure as feeders which serve critical loads such as hospitals, major sewage treatment plants and fuel depots. *Id.* Distribution crossings over Interstates 10 and 110 are also considered critical infrastructure. *Id.* As part of its EWL pilot project, Gulf is installing wind monitoring devices close to the individual EWL projects. These devices should enable Gulf to gather valuable data to assist in the determination of the effectiveness of the EWL projects. *Id.* The use of targeted pilot projects will allow Gulf to collect information and better evaluate the effectiveness of EWL standards in the context of storm hardening. [Tr. 98, 102]

Along with Gulf's pilot EWL projects, Gulf is adopting Grade B construction standards for new construction, major expansions, rebuilds, and relocations of distribution facilities. [Tr. 94] As discussed previously, Gulf's field experience strongly supports that pole failures on its system during hurricanes are not the result of wind-only impacts. [Tr. 93, 97] Despite this, Gulf's adoption of Grade B construction for new construction, major expansions, rebuilds, and relocations of distribution facilities is prudent given the cost to implement Grade B construction and the potential for positive storm hardening benefits. Based on historical hurricane data, Gulf's move to Grade B construction with its "equivalent wind" load rating of 118 MPH will strengthen Gulf's distribution system to address approximately 80% of the storms likely to impact Gulf's service area. [Tr. 96-97] In addition, Gulf will be able to compare the effectiveness of Grade B construction in future hurricanes to the effectiveness of Grade C construction. [Tr. 97] The adoption of Grade B construction for new construction, major expansions, rebuilds, and relocations of distribution facilities coupled with the pilot EWL

projects targeting critical infrastructure is a prudent, cost-effective means to address the extreme wind loading standards specified by Figure 250-2(d) of the 2007 edition of the NESC. Adoption of EWL standards over and above Grade B standards is not prudent at this time. [Tr. 99] The adoption of EWL in Gulf's service area would result in significant costs to Gulf and its customers without a corresponding benefit that is likely to be greater than that which is potentially achievable through the adoption of Grade B construction alone at a much lower cost.

ISSUE 30: Does the Company's Plan address the extent to which the extreme wind loading standards specified by Figure 250-2(d) of the 2007 edition of the NESC are adopted for distribution facilities serving critical infrastructure facilities and along major thoroughfares taking into account political and geographical boundaries and other applicable operational considerations?

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SUMMARY: Yes. Gulf is adopting Grade B construction standards for all new and major rebuilds of existing distribution facilities that serve critical infrastructure facilities or cross major thoroughfares. Gulf proposes a pilot program adopting Extreme Wind Loading standards for main feeder distribution systems that serve critical infrastructure or cross major thoroughfares.

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DISCUSSION:

Gulf relied on its many years of storm restoration experience in determining how to cost-effectively meet the requirements of Rules 25-6.0341 and 25-6.0342, F.A.C., which address extreme wind loading standards. [Tr. 93, 96] While several hurricanes have affected Gulf's service area over the past 15 years, Gulf appropriately relied on field observations of the impacts on distribution facilities from two recent hurricanes, Hurricane Ivan in 2004 and Hurricane Dennis in 2005. [Tr. 93] Hurricane Ivan made landfall just west of Pensacola Beach. The eye of Hurricane Dennis came ashore approximately 15 miles from Pensacola Beach on Santa Rosa Island between Navarre Beach and Gulf Breeze, which is nearly 80 miles from Panama City Beach. [Tr. 516, Exhibit 18 at Schedule 8, Exhibit 35 at pages 2-3] These two hurricanes

provide Gulf-specific information regarding the impacts of hurricane-force winds in Gulf's service area. [Tr. 93, 96] The field observations of the impacts on distribution facilities of Hurricanes Ivan and Dennis strongly indicate that pole failures in Gulf's service area were not the result of wind-only impacts during hurricanes, but rather from the impacts of wind-carried debris and from off right-of-way trees falling into distribution facilities. [Tr. 93, 97] Given that Gulf's recent firsthand experience is that wind-blown debris, not wind-only impacts, is the predominant cause of damage to distribution facilities in hurricanes and that the estimated cost to adopt EWL for all of its distribution facilities is approximately $437 million, Gulf determined that it was prudent to approach EWL standards through targeted pilot projects focusing on critical infrastructure and interstate crossings and to not adopt EWL standards for all of its distribution facilities. [Tr.96, 98-99] As part of its Storm Hardening Plan, Gulf proposes to adopt EWL standards as specified by Figure 250-2(d) of the 2007 NESC for certain of its critical infrastructure in the 2007 through 2009 time period. [Tr. 98] The types of facilities to be targeted with EWL projects were identified using input from county emergency operation centers. *Id.* This input helped Gulf define critical infrastructure as feeders which serve critical loads such as hospitals, major sewage treatment plants and fuel depots. *Id.* Distribution crossings over Interstates 10 and 110 are also considered critical infrastructure. *Id.* The proposed EWL projects are identified in Schedule 10 of Exhibit 18, as well as in Sections 5.0 and 9.1 of Gulf's Storm Hardening Plan. [Tr. 98] These schedules provide not only location information, but also the type of load, the feeder identification number, and total main feeder miles and cost information. [Exhibit 18, Schedule 10 and Plan at Sections 5.0 and 9.1] The information on these schedules, along with the map found in Schedule 2 of Exhibit 18 and Appendix 1 of Gulf's Storm Hardening Plan, show the location of the facilities addressed in the

EWL pilot projects. The aforementioned map has clear markings indicating the location of each of the EWL pilot projects. [Exhibit 18, Schedule 2 and Plan at Appendix 1] This map also shows the community and specific areas where the projects will be undertaken. *Id.* Additional maps with detailed facility and location data were made available to third-party attachers and other interested parties before and after the filing of Gulf's Storm Hardening Plan. [Tr. 161] The use of targeted pilot projects will allow Gulf to collect information and better evaluate the effectiveness of EWL standards in the context of storm hardening. [Tr. 98, 102]

Along with Gulf's pilot EWL projects, Gulf is adopting Grade B construction standards for new construction, major expansions, rebuilds, and relocations of distribution facilities serving critical infrastructure facilities and along major thoroughfares. [Tr. 94] Gulf Power's deployment of Grade B construction standards applies to Gulf's entire distribution system. As discussed previously, Gulf's field experience strongly supports that pole failures on its system during hurricanes are not the result of wind-only impacts. [Tr. 93, 97] Despite this, Gulf's adoption of Grade B construction standards for new construction, major expansions, rebuilds, and relocations of distribution facilities, including those facilities serving critical infrastructure facilities and along major thoroughfares, is prudent given the cost to implement Grade B construction and the potential for positive storm hardening benefits. Based on historical hurricane data, Gulf's move to Grade B construction with its "equivalent wind" load rating of 118 MPH will strengthen Gulf's distribution system to address approximately 80% of the storms likely to impact Gulf's service area. [Tr. 96-97] In addition, Gulf will be able to compare the effectiveness of Grade B construction in future hurricanes to the effectiveness of Grade C construction. [Tr. 97] The adoption of Grade B construction standards for new construction, major expansions, rebuilds, and relocations of distribution facilities serving critical infrastructure

facilities and along major thoroughfares coupled with the pilot EWL projects targeting critical infrastructure is a prudent, cost-effective means to address the extreme wind loading standards specified by Figure 250-2(d) of the 2007 edition of the NESC. [Tr. 98] Adoption of EWL standards over and above Grade B standards is not prudent at this time. [Tr. 99] The adoption of EWL throughout Gulf's service area would result in significant costs to Gulf and its customers without a corresponding benefit that is likely to be greater than that which is potentially achievable through the adoption of Grade B construction alone at a much lower cost.

ISSUE 31: Does the Company's Plan address the extent to which its distribution facilities are designed to mitigate damage to underground and supporting overhead transmission and distribution facilities due to flooding and storm surges?

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SUMMARY: **STIPULATED.** Yes. Gulf has developed overhead and underground distribution storm hardening specifications to mitigate damage due to flooding and storm surges. Appendices 5 and 6 of Gulf's Storm Hardening Plan describe these specifications. Gulf has distribution pilot projects in potential storm surge areas to test the effectiveness of mitigation techniques.

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ISSUE 32: Does the Company's Plan address the extent to which the placement of new and replacement distribution facilities facilitate safe and efficient access for installation and maintenance pursuant to Rule 25-6.0341, F.A.C?

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SUMMARY: **STIPULATED.** Yes.

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ISSUE 33: Does the Company's Plan provide a detailed description of its deployment strategy including a description of the facilities affected; including technical design specifications, construction standards, and construction methodologies employed?

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SUMMARY: **STIPULATED.** Yes. Section 9.1 of Gulf's Storm Hardening Plan describes the 3-year deployment strategy for the proposed EWL critical infrastructure pilot projects. Appendices 5 and 6 of the Company's Plan contain the design and construction specifications for the overhead and underground distribution facilities.

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ISSUE 34: Does the Company's Plan provide a detailed description of the communities and areas within the utility's service area where the electric infrastructure improvements, including facilities identified by the utility as critical infrastructure and along major thoroughfares pursuant to subparagraph (3)(b)3 are to be made?

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SUMMARY: Yes. Section 9.1 of Gulf's Storm Hardening Plan identifies the proposed critical infrastructure project locations. In addition, Appendix 1 of the Plan is a map that shows the location of the proposed critical infrastructure projects in relation to the communities in N.W. Florida.

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DISCUSSION:

Gulf Power's Storm Hardening Plan provides a detailed description of the actual locations of the facilities that are included in Gulf's proposed Extreme Wind Load pilot projects. [Tr. 98] The proposed EWL projects are identified and described in Schedule 10 of Exhibit 18, as well as in Sections 5.0 and 9.1 of Gulf's Storm Hardening Plan. *Id.* The descriptions provide not only location information, but also the type of load, the feeder identification number, and total main feeder miles and cost information. [Exhibit 18, Schedule 10 and Plan at Sections 5.0 and 9.1] Schedule 2 of Exhibit 18 and Appendix 1 of Gulf's Storm Hardening Plan include a map with clear markings indicating the location of each of the pilot EWL projects. [Exhibit 18, Schedule 2 and Plan at Appendix 1] This map shows the communities and specific areas where the projects will be undertaken. *Id.* Additional location maps were made available to third-party attachers and other interested parties before and after the filing of Gulf's Storm Hardening Plan. [Tr. 161] None of the third-party attachers who expressed interest in Gulf's Storm Hardening Plan are expressing concern with the level of information provided to them by Gulf in regard to the location of facilities included in Gulf's Storm Hardening Plan. In fact, Gulf Power and the third-party attachers have entered into an agreement, referred to as the "Process to Engage Third

Party Attachers", that documents a process through which additional information will be provided by Gulf to interested third parties on a periodic basis. [Tr. 11-12]

Gulf Power's deployment of Grade B construction standards for new construction, major expansions, rebuilds, and relocations of distribution facilities applies to Gulf's entire distribution system. It is not possible for Gulf to identify the locations on a map of each new construction, major expansion, rebuild, and relocation of distribution facilities in the 2007 through 2009 timeframe since this information becomes available much closer in time to the actual new construction, major expansion, rebuild, or relocation of distribution facilities. Gulf will continue to provide interested parties with information about specific Grade B upgrades as that information becomes available. [Tr. 160-61] The "Process to Engage Third Party Attachers" will facilitate future communications between Gulf and interested parties regarding the details of new construction, major expansion, rebuild, or relocation of distribution facilities.

With regard to Gulf Power's underground distribution pilot projects, the exact locations of future projects are not known at this time because of the nature of the pilot projects. The underground distribution pilot projects involve the use of damage mitigation techniques, such as installation of below-grade gear and/or heavy lids and anchoring systems on flush-mounted switch enclosures, in potential storm surge areas to determine their effectiveness as storm hardening techniques. [Tr. 130-31, 517] Appendix 6 of Gulf's Storm Hardening Plan provides specifications for the use of these pilot mitigation techniques. Customers requesting underground distribution facilities in areas affected by storm surge will trigger these pilot projects. [Tr. 130-31, 517] Each underground distribution facility installed utilizing the pilot mitigation techniques will be a pilot underground project. Gulf has already begun utilizing these damage mitigation techniques on a pilot basis in Destin, Pensacola Beach and Panama City

Beach. [Tr. 131]

ISSUE 35: Does the Company's Plan provide a detailed description of the extent to which the electric infrastructure improvements involve joint use facilities on which third-party attachments exist?

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SUMMARY: Yes. Gulf's Storm Hardening Plan sufficiently describes the proposed storm-hardened facilities such that third-party attachers can determine whether their facilities are affected. Gulf provided sufficiently detailed location maps of potentially-impacted joint use facilities to all interested third-party attachers. No dispute exists between Gulf and interested third-party attachers on this issue.

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DISCUSSION:

Gulf Power has worked with interested third-party attachers to provide details of proposed electric infrastructure improvements sufficient to enable the third-party attachers to determine potential cost and/or benefits related to joint-use facilities from Gulf's storm hardening activities. [Tr. 160-161, Plan at Section 12.0] Detailed location maps of potentially-impacted joint-use facilities have been provided to all interested third-party attachers. [Tr. 161] The locations identified on the maps indicate where a third-party attacher has one or more attachments on one or more poles. *Id.* Gulf continues to provide additional information as it becomes available. *Id.* The "Process to Engage Third Party Attachers" will provide a mechanism for the flow of information between Gulf and interested third-party attachers.

Gulf Power's Storm Hardening Plan provides a detailed description of the actual locations of the facilities that are included in Gulf's proposed Extreme Wind Load pilot projects. [Tr. 98] The proposed EWL projects are identified and described in Schedule 10 of Exhibit 18, as well as in Sections 5.0 and 9.1 of Gulf's Storm Hardening Plan. *Id.* The descriptions provide not only location information, but also the type of load, the feeder identification number, and total main feeder miles and cost information. [Exhibit 18, Schedule 10 and Plan at Sections 5.0

and 9.1] Schedule 2 of Exhibit 18 and Appendix 1 of Gulf's Storm Hardening Plan include a map with clear markings indicating the location of each of the pilot EWL projects. [Exhibit 18, Schedule 2 and Plan at Appendix 1] This map shows the communities and specific areas where the projects will be undertaken. *Id.* Additional location maps were made available to third-party attachers and other interested parties before and after the filing of Gulf's Storm Hardening Plan. [Tr. 161] None of the third-party attachers who expressed interest in Gulf's Storm Hardening Plan are expressing concern with the level of information provided to them by Gulf in regard to the location of potentially-impacted third-party facilities affected by Gulf's Storm Hardening Plan. In fact, Gulf Power and the third-party attachers have entered into an agreement, referred to as the "Process to Engage Third Party Attachers", that documents a process through which additional information will be provided by Gulf to interested third parties on a periodic basis. [Tr. 11-12]

Gulf Power's deployment of Grade B construction standards for new construction, major expansions, rebuilds, and relocations of distribution facilities applies to Gulf's entire distribution system. It is not possible for Gulf to identify the locations on a map of each new construction, major expansion, rebuild, and relocation of distribution facilities in the 2007 through 2009 timeframe. Gulf will continue to provide interested parties with information about specific Grade B upgrades as that information becomes available. [Tr. 160-61] The "Process to Engage Third Party Attachers" approved by stipulation among the utilities and the third-party attachers provides for the sharing of information on a periodic basis between the respective utility and interested third-party attachers.

With regard to Gulf Power's underground distribution pilot projects, the exact locations of future projects are not known at this time because of the nature of the pilot projects. The

underground distribution pilot projects involve the use of damage mitigation techniques, such as installation of below-grade gear and/or heavy lids and anchoring systems on flush-mounted switch enclosures, in potential storm surge areas to determine their effectiveness as storm hardening techniques. [Tr. 130-31, 517] Appendix 6 of Gulf's Storm Hardening Plan provides specifications for the use of these pilot mitigation techniques. Customers requesting underground distribution facilities in areas affected by storm surge will trigger these pilot projects. [Tr. 130-31, 517] Each underground distribution facility installed utilizing the pilot mitigation techniques will be a pilot underground project. Gulf has already begun utilizing these damage mitigation techniques on a pilot basis in Destin, Pensacola Beach and Panama City Beach. [Tr. 131]

ISSUE 36: Does the Company's Plan provide an estimate of the costs and benefits to the utility of making the electric infrastructure improvements, including the effect on reducing storm restoration costs and customer outages?

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SUMMARY: Yes. Total storm hardening costs for Gulf are estimated to be $20 million per year for 2007-2009 with a per-customer cost of $46. Potential benefits achievable through storm hardening cannot be determined at this time. Gulf has activities in place to determine those benefits as more detailed information becomes available.

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DISCUSSION:

To the extent possible, Gulf provided an estimate of the costs and benefits, including potential impact on storm restoration costs and customer outages of the activities in its Storm Hardening Plan. [Tr. 101-02] Gulf Power's Storm Hardening Plan provides an estimate of the incremental cost of the storm hardening activities proposed by Gulf for the years 2007 through 2009. [Tr. 102] Appendix 7 of Gulf's Storm Hardening Plan lists each storm hardening activity and indicates associated costs and potential benefits known at this time. *Id.* For the years 2007

through 2009, Gulf estimates that the total cost of storm hardening will be approximately $20 million per year. [Tr. 101] This results in a cost on a per-customer basis of $46. [Tr. 102] The incremental storm hardening activities have a retail revenue requirement of approximately $8.3 million, which would equate to $0.28 for the cost of 1,000 kWh to a residential customer. *Id.*

The storm hardening activities proposed in Gulf's Storm Hardening Plan are likely to result in some mitigation of storm damage and resulting customer outages. [Tr. 101-02] Preliminary estimates of the possible benefits of Gulf's transition from Grade C to Grade B construction standards and the EWL pilot projects indicate that these activities are cost-effective, though it cannot be determined at this time just how much of a positive impact these activities will have on storm restoration or customer outages. [Tr. 102, Plan at 28, Exhibit 45] Gulf is not able to perform an exact cost and benefit analysis since it lacks the necessary storm impact and cost data that is necessary to determine potential costs and benefits of a particular storm hardening activity. [Tr. 93, 121, 504] Gulf utilized its field observations from Hurricanes Ivan and Dennis which directly impacted Gulf's service area in 2004 and 2005, respectively, along with available data and made assumptions regarding future storm frequency and intensity to determine a range of possible benefits for these parts of its Storm Hardening Plan. [Tr. 93, 99, 110] Prior to the storm seasons of 2004 and 2005, the focus of Gulf's storm damage data collection efforts was to ensure proper accounting through the Company's property insurance reserve. This data was collected in broad categories, not into subsets differentiating costs by what caused the damage or by distribution facility type. [Tr. 93, 138, 140-42, Exhibit 48] Until the utilities filed their Ten-Part Initiatives in Docket 060198-EI, there was no requirement for utilities to collect data at a level sufficient for them to identify the exact cause of damage to a distribution facility by a hurricane or identify specific costs for the damaged distribution

facilities. [Tr. 88-89, 505, 531-32] Moreover, a review of the storm hardening plans filed by the utilities reveals that none of the utilities have such data at this time. Contrary to the position taken by Panama City Beach and the Municipal Underground Utilities Consortium (hereafter referred to as "PCB"), existing data does not provide the necessary details from which the potential benefits of undergrounding as a storm hardening activity can be determined. [Tr. 120-21, 532-33] Simply knowing the number of poles or the amount of wire used in a restoration effort does not provide sufficient information for determining whether a storm hardening activity is or will be effective from a cost and performance standpoint. On an ongoing basis as part of the Ten-Part Initiatives and the Storm Hardening Plan, Gulf will be collecting forensic data differentiating damage by cause and by type of distribution facility. [Tr. 512, 514, 531-33] In addition, Gulf will be collecting outage data differentiating between overhead and underground distribution facilities. [Tr. 512, 531-32, Plan at 15] The Storm Hardening Plan before the Commission in this docket is a first step that will be updated as additional data becomes available. Gulf will also review industry efforts related to storm hardening such as the research being performed by PURC. [Tr. 507, 512, Plan at 17]

Gulf's adoption of Grade B construction standards for new construction, major expansions, rebuilds, and relocations of distribution facilities is cost-effective based on available information. [Tr. 103-04] Although Gulf's experience is that wind-blown debris is the predominant cause of damage in a hurricane, not pure wind impacts, Gulf has proposed the adoption of Grade B construction standards for new construction, major expansions, rebuilds, and relocations of distribution facilities. [Tr. 93, 97] The move from Grade C construction standards to Grade B construction standards is cost effective, using the high level cost-effectiveness analysis Gulf describes in Exhibit 45, with an annual cost of $225,000 for years

2008 and 2009 and up to approximately $1.1 million of potential benefit depending on the number and severity of storms in the future. [Tr. 97, 99, 102] Gulf will continue to analyze the effectiveness of its adoption of Grade B construction through direct comparison of Grade B construction to Grade C construction in its service area. [Tr. 97] Gulf's analysis of EWL standards indicated that Gulf's adopting extreme wind loading standards throughout its system would cost approximately $437 million with an estimated potential benefit of approximately $1.1 million. [Tr. 99] This shows no net benefit of going to EWL over Grade B construction. Thus, system-wide adoption of EWL standards by Gulf is clearly not cost-effective. The fact that Gulf's recent storm experience is that the pure wind impacts of a hurricane are not the predominant cause of damage also strongly indicates that EWL standards should not be adopted for all of Gulf's distribution system. [Tr. 93, 97] Instead of adopting EWL standards on a system-wide basis at this time, Gulf looked at the use of targeted pilot EWL projects that would enable Gulf to gather company-specific data on storm impacts and costs as they relate to distribution facilities built to EWL standards. [Tr. 96, 98-99] Gulf determined that it was prudent to approach EWL standards through targeted pilot projects focusing on critical infrastructure and interstate crossings. *Id.* The proposed EWL projects are identified in Schedule 10 of Exhibit 18 and in Sections 5.0 and 9.1 of Gulf's Storm Hardening Plan. [Tr. 98] Gulf is also installing wind monitors at various locations close to its EWL projects to collect necessary wind data to help determine the effectiveness of the EWL projects. *Id.* The use of targeted pilot EWL projects is a proactive and prudent attempt to address EWL standards in Gulf's service area.

Gulf adequately considered undergrounding as a storm hardening activity and determined that, at this time, undergrounding was not a prudent storm hardening activity. [Tr. 504-05] In its

analysis of undergrounding as a storm hardening activity, Gulf considered whether undergrounding was cost-effective and whether undergrounding resulted in reduced customer outages and restoration times both in the aftermath of a storm and on a day-to-day basis. [Tr. 505] The result of Gulf's analysis is that undergrounding should not be adopted as a storm hardening activity at this time, but rather that a continued look at storm damage mitigation techniques related to underground distribution facilities should be undertaken on a pilot basis. [Tr. 506]

The first step in Gulf Power's analysis of undergrounding was to look at cost. PCB witness Rant agrees that the utility, in this case Gulf Power, is in the best position to know the conditions found on its system and how they relate to the installation costs of underground. [Tr. 485] Gulf has determined that the cost of undergrounding as a storm hardening activity is extremely high. [Tr. 505-06, 513] The cost impact of converting Gulf's existing overhead systems to underground in just three targeted areas in Pensacola, Fort Walton Beach and Panama City Beach is estimated to be a staggering $780 million. [Tr. 513] To put this number in proper context, the $780 million amounts to 150% of Gulf's current total system net distribution investment. [Tr. 513-14] This only represents the initial installation cost without consideration of unknown subsurface obstacles that may be found at the time of installation which could potentially lead to additional cost. [Tr. 485] It is undisputed that underground distribution costs more than overhead at the time of initial installation. [Tr. 505] In addition to this initial higher cost, Gulf Power has firsthand experience with the destruction of underground distribution facilities caused by storm surge and sand infiltration from Hurricanes Opal, Ivan and Dennis. [Exhibit 39 at Schedule 1, Exhibit 4 at Item 16] Gulf's experience is that the cost to restore underground facilities after a storm is higher than that to restore overhead facilities. [Tr. 93-94,

139-40, 506] Witness Rant on behalf of PCB agrees that replacing underground facilities that are destroyed by a storm surge is more expensive and takes longer than repairing overhead facilities in the same location. [Tr. 440] A review of Exhibit 18, Schedule 3, shows that much of the population in Gulf Power's service area is located along coastal areas.

The second part of the analysis of undergrounding was a determination of the potential benefits of undergrounding as a storm hardening activity. Gulf adequately analyzed the potential benefits of undergrounding as a storm hardening activity. [Tr. 93, 54] The key question to be answered here is whether undergrounding results in reduced customer outages and restoration times in the aftermath of a storm and on a day-to-day basis such that undergrounding may provide benefits to offset the extreme costs associated with undergrounding as a storm hardening activity. [Tr. 505] Gulf's experiences with underground facilities on a day-to-day operational basis and during Hurricanes Opal, Ivan and Dennis indicate that undergrounding has significant limitations as a storm hardening activity. [Tr. 505-06]

The main benefit of undergrounding as a storm hardening activity touted by PCB and other proponents of undergrounding is the idea that customers served by underground facilities experience fewer outages during storm events which equates to reduced storm restoration costs. [Tr. 435, 437] This potential benefit appears to be premised on the idea that underground facilities are not damaged by hurricane winds and wind-blown debris in a storm, and that if the underground facilities are intact then the underground crews can be sent to restore service in areas served by overhead. [Tr. 438] The foregoing view is overly simplistic and is contradicted by PCB witness Rant. First, on Gulf Power's system, nearly all of Gulf's underground distribution facilities are fed from overhead distribution facilities. [Tr. 481] Therefore, the effects of wind and wind-blown debris still impact customers ultimately served by underground

distribution facilities. Hardening the overhead facilities that feed the underground facilities would be extremely costly as discussed above. Moreover, Mr. Rant's claim that the underground facilities will be undamaged and intact after a storm event is incorrect as discussed below. However, even assuming that Mr. Rant is correct, his own testimony is contradictory. He first testified that in his opinion utilities realize significant additional benefits in the storm restoration environment through undergrounding because they do not need to deploy restoration crews to the areas served by underground facilities, which would then make those crews available to restore areas served by overhead facilities. [Tr. 438] He then contradicts himself by correctly pointing out that the overhead and underground crews are not interchangeable. [Tr. 452] Overhead crews and underground crews are different from one another and have specific tools and equipment for their respective types of work. Therefore, underground crews are not available to restore overhead damage. PCB's underlying premise regarding the benefits of undergrounding is simply not supported by the facts.

Another premise offered by PCB is that underground distribution facilities are not damaged during storm events. [Tr. 435] This is clearly not correct. In fact, Gulf has seen its underground distribution system repeatedly damaged by hurricanes. [Exhibit 39 at Schedule 1, Exhibit 4 at Item 16] Gulf is not speculating as to the damage caused by direct storm impacts as do Mr. Rant and Mr. Willoughby. Mr. Willoughby relies solely on his utility's experiences with hurricanes that made landfall ranging from 86 miles to 159 miles from his utility. [Tr. 509-10] Mr. Rant relies on his experience with one tropical storm. [Tr. 508] Neither Mr. Rant nor Mr. Willoughby make any comparison of Northwest Florida to any of the regions of the country which they claim serve as an example for storm hardening. Gulf's first-hand experience is from the direct impacts of two recent hurricanes, Ivan and Dennis, in 2004 and 2005 respectively.

Hurricane Opal caused similar damage just over a decade ago to Pensacola Beach. [Tr. 93, 96, 519, Exhibit 39 at Schedule 1 and Exhibit 4, Document 1, Item 16] The extreme and widespread damage caused by these hurricanes on Gulf Power's underground distribution system is shown through a vivid pictorial history in the testimony of Mr. Battaglia in this proceeding. [Exhibit 39 at Schedule 1 and Exhibit 4, Document 1, Item 16] This damage was from storm surge, the salt water and fine sand slurry that infiltrate the distribution facilities in its path. [Tr. 508] Many areas suffered a complete washout of Gulf's underground distribution facilities. [Exhibit 39 at Schedule 1] Again, in discussing his storm restoration experience, Mr. Willoughby does not mention having any actual hurricane restoration experience, but offers an opinion that washouts are unusual. [Tr. 472] He offers no evidence that it is true in Gulf Power's service area. Again, he makes no comparison of Gulf Power's service area to the service area upon which he bases his opinion. [Tr. 509] Likewise, Mr. Rant offers no evidence that he is familiar with the specifics of Gulf Power's service area and provides no factual basis for his opinion regarding the survivability of underground systems in a storm event. [Tr. 509] Moreover, the pictures in Exhibit 39, Schedule 1 show more than just areas of complete washout. In many instances, all of the underground distribution system was destroyed. [Exhibit 39 at Schedule 1] Piles of sand and debris, as well as examples of the destruction to switch gear and underground cable, are shown throughout the pictorial history for the various storms. [Exhibit 39 at Schedule 1] Even a cursory look at the pictures would reveal that finding and repairing the damage to the underground distribution facilities after a storm event results in longer outages. [Tr. 505-06] The Commission has a policy requiring the utilities to install distribution facilities in a manner that considers the need to facilitate safe and efficient access to those distribution facilities. [Rule 25-6.0341, F.A.C.] Installing underground distribution facilities in areas where they are subject

to being covered by sand or debris during and after a storm event impedes the goals of Rule 25-6.0341, F.A.C. In the areas shown in the pictures where underground distribution facilities were destroyed or severely damaged, if Gulf had loop feeds in the same area, one can easily infer that they would also have been destroyed or severely damaged, which would have resulted in Gulf Power having to rebuild even more underground facilities at a cost higher than that to construct overhead facilities. [Tr. 506] Based on the foregoing, the correct conclusion is that underground facilities are susceptible to damage in storm situations. Therefore, replacing overhead facilities with underground facilities just substitutes the need to repair or replace damaged overhead facilities with the need to replace or repair more costly underground facilities.

As discussed above, undergrounding does not appear to have identifiable and quantifiable benefits from a storm hardening standpoint at this time. In order to have a complete analysis of undergrounding, Gulf also looked at the day-to-day impact of undergrounding to determine any potential benefits that may offset the extreme costs associated with undergrounding. [Tr. 505] Gulf's experience indicates that the day-to-day O&M cost of underground distribution facilities is greater than that of overhead distribution facilities. [Tr. 94, 505] Gulf is collecting additional detailed information on the differences in O&M between overhead and underground distribution facilities as set forth in its Ten-Part Initiatives. [Tr. 507] This more detailed information will help Gulf better define the true cost of operating and maintaining underground and overhead distribution facilities. Moreover, finding and repairing problems on an underground system takes longer and costs more than for comparable overhead facilities. [Tr. 505-06] Given that the preference in Rule 25-6.0341, F.A.C., is for underground distribution facilities to be installed in front of a customer's premise, any trenching or boring during installation, maintenance or repair must take place in the customer's front yard or in the right-of-way in front of a customer's

home. PCB witness Willoughby correctly points out that aspects of installing underground facilities is disruptive to the customer's property. [Tr. 484] Witness Willoughby also claims that there is a public safety benefit associated with undergrounding. [Tr. 440] He appears to base this claim on an idea that there is less exposure to the utility from vehicles hitting distribution poles because there are fewer distribution poles. *Id.* This completely ignores the fact that underground distribution has components that are above ground and that these facilities have a far larger footprint than a distribution pole. [Exhibit 39, Schedule 1, at page 2] Based on the foregoing, undergrounding as a storm hardening activity has no identifiable day-to-day benefits sufficient to offset the extreme costs associated with installing, operating, maintaining or repairing underground distribution facilities. In fact, the available information suggests that undergrounding results in additional costs on a day-to-day basis.

Finally, Gulf's Storm Hardening Plan appropriately focuses on finding ways to mitigate damage to underground facilities during storm events. [Tr. 506] Gulf is piloting several storm damage mitigation techniques as they relate to underground facilities. [Tr. 100, 505-06 and Plan at Appendices 5 and 6] For example, Gulf is piloting the use of heavy lids and anchoring systems on flush-mounted switch gear and below-grade gear. *Id.* Mr. Rant apparently agrees with Gulf's pilot underground projects, but jumps to an unfounded conclusion that the techniques will definitely work and will have positive storm benefits that can be quantified now. [Tr. 441] While Gulf believes that these pilot projects have high potential to work in some instances, Gulf does not have any factual evidence to support how effective they will be in future storm events. [Tr. 134-35] The storm damage mitigation techniques have not yet been tested by a storm event. *Id.* Further, Gulf is collecting O&M data related to underground and overhead distribution facilities as part of its Ten-Part Initiatives. [Tr. 507] In addition, Gulf has a process in place to

collect storm data, to perform a forensic analysis of that storm data, and to collect outage data differentiating between overhead and underground systems. *Id.* Gulf is also participating in collaborative storm hardening research through the PURC. These efforts will enable Gulf to continue to study and to refine its storm hardening activities as they relate to undergrounding and EWL standards. *Id.*

Gulf Power Company's Storm Hardening Plan can reasonably be expected to enhance the reliability and reduce restoration cost and outage times in a cost-effective manner. By adopting Grade B construction standards on all new construction, major expansions, rebuilds, and relocations of distribution facilities, along with utilizing an Extreme Wind Load (EWL) pilot project approach on critical infrastructure facilities and performing underground storm hardening projects where appropriate, Gulf's Storm Hardening Plan is prudent, practical, and cost-effective. [Tr. 103-04]

ISSUE 37: Does the Company's Plan provide an estimate of the costs and benefits, obtained pursuant to subsection (6) below, to third-party attachers affected by the electric infrastructure improvements, including the effect on reducing storm restoration costs and customer outages realized by the third-party attachers?

***

SUMMARY: Yes. Gulf's Storm Hardening Plan includes sufficient data to allow third-party attachers to estimate their costs and benefits resulting from the implementation of Gulf's Storm Hardening Plan. Section 12 of Gulf's Storm Hardening Plan contains the information received from the third-party attachers regarding potential costs and benefits.

***

DISCUSSION:

The best source of cost and benefit data as it relates to third-party attachers and Gulf's Storm Hardening Plan is the third-party attachers themselves, not Gulf Power. Rule 25-6.0342(6) allows interested-third party attachers to provide comments on utility storm hardening

plans. Gulf Power actively sought this input from interested third-party attachers prior to filing its Storm Hardening Plan in May 2007 and has requested that third-party attachers update the information as they deem necessary. [Tr. 160-61, Exhibit 4 at page 9 of Item 3] Section 12.0 of Gulf's Storm Hardening Plan provides the information, including preliminary cost and benefit data, which was provided by the third-party attachers to Gulf Power. [Tr. 161] Since the filing of Gulf's Storm Hardening Plan, Gulf has continued to work with third-party attachers in an effort to provide to them additional information as it becomes available. [Exhibit 4 at page 9 of Item 3] The agreement between the utilities and the third-party attachers regarding "Third-Party Attacher Process" resolves all issues between Gulf and the third-party attachers related to this issue. [Tr. 11-12]

ISSUE 38: Does the Company's Plan include written Attachment Standards and Procedures addressing safety, reliability, pole loading capacity, and engineering standards and procedures for attachments by others to the utility's electric transmission and distribution poles that meet or exceed the edition of the National Electrical Safety Code (ANSI C-2) that is applicable pursuant to Rule 25-6.034, F.A.C.?

***

SUMMARY: **STIPULATED.** Yes. Gulf has attachment standards and procedures for third party attachments that meet or exceed the NESC.

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ISSUE 39: Based on the resolution of the preceding issues, should the Commission find that the Company's Plan meets the desired objectives of enhancing reliability and reducing restoration costs and outage times in a prudent, practical, and cost-effective manner to the affected parties? [Rule 25-6.0342(1) and (2)]

***

SUMMARY: Yes. By adopting Grade B construction standards on all new and major distribution rebuilds, along with utilizing an EWL pilot project approach on critical infrastructure facilities and performing underground storm hardening projects where appropriate, Gulf's Storm Hardening Plan is prudent, practical, and cost-effective.

***

DISCUSSION:

Gulf Power Company's Storm Hardening Plan, which includes the Ten-Part Initiatives that were approved by the Commission in Order Nos. PSC-06-0781-PAA-EI and PSC-06-0947-PAA-EI, can reasonably be expected to enhance reliability and reduce restoration cost and outage times in a cost-effective manner. By adopting Grade B construction standards on all new construction, major expansions, rebuilds, and relocations of distribution facilities, along with utilizing an Extreme Wind Load pilot project approach on critical infrastructure facilities and performing underground storm hardening projects where appropriate, Gulf's Storm Hardening Plan is prudent, practical, and cost-effective. [Tr. 103-04]

Dated this 1st day of November, 2007.

Respectfully submitted,

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BEFORE THE FLORIDA PUBLIC SERVICE COMMISSION

IN RE: Review of 2007 Electric Infrastructure Storm Hardening Plan filed pursuant to Rule 25-6.0342, Florida Administrative Code, submitted by Gulf Power Company

Docket No.: **070299-EI**

CERTIFICATE OF SERVICE

I HEREBY CERTIFY that a true copy of the foregoing was furnished by regular U. S. mail, all this 1ST day of November, 2007, on the following:

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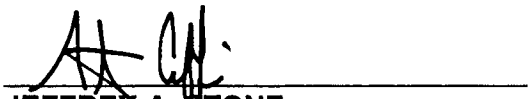

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