FLORIDA SOUTHEAST CONNECTION PROJECT

RESOURCE REPORT 11

Reliability and Safety

September 2014

FLORIDA SOUTHEAST CONNECTION™

TABLE OF CONTENTS

FLORIDA SOUTHEAST CONNECTION™

LIST OF TABLES

RESOURCE REPORT 11—RELIABILITY AND SAFETY		
	Filing Requirement	**Location in Environmental Report**
☒	Describe how the project facilities would be designed, constructed, operated, and maintained to minimize potential hazard to the public from the failure of project components as a result of accidents or natural catastrophes. (§ 380.12(m))	Section 11.2 to 11.4

ACRONYMS AND ABBREVIATIONS

Certificate	Certificate of Public Convenience and Necessity
CFR	Code of Federal Regulations
FERC	Federal Energy Regulatory Commission
FGT	Florida Gas Transmission Company, LLC
FSC	Florida Southeast Connection, LLC
Guidelines	Pipeline Security Division's Security Guidelines
Gulfstream	Gulfstream Natural Gas System, LLC
HCA	High Consequence Areas
MMcf/d	Million cubic feet per day
MP	milepost
NextEra	NextEra Energy, Inc.
NACE	National Association of Corrosion Engineers
NGA	Natural Gas Act
PHMSA	Pipeline and Hazardous Materials Safety Administration
RCAs	Root Cause Analyses
SSOCOF	Sunshine State One Call of Florida
Transco	Transcontinental Gas Pipe Line Company, LLC
TSA	Transportation Safety Administration
USDOT	U.S. Department of Transportation

11.0 RESOURCE REPORT 11 – RELIABILITY AND SAFETY

11.1 INTRODUCTION

Florida Southeast Connection, LLC ("FSC"), a subsidiary of NextEra Energy, Inc., is seeking a Certificate of Public Convenience and Necessity ("Certificate") from the Federal Energy Regulatory Commission ("FERC") pursuant to Section 7(c) of the Natural Gas Act ("NGA") authorizing the construction and operation of an approximately 126.4 mile natural gas pipeline known as the Florida Southeast Connection Project ("FSC Project"). The FSC Project is designed to meet the increased demand for natural gas by the electric generation, distribution, and end use markets in Florida. The FSC Project will also provide additional natural gas supply diversity through a connection to the new Sabal Trail Transmission Pipeline Project ("Sabal Trail") via a new interconnection hub in central Florida ("Central Florida Hub"). The Sabal Trail Project is the subject of a separate, but related, certificate filing to the FERC.

The FSC Project will increase natural gas transportation capacity and availability to southern Florida by adding a new third pipeline in central and southern Florida. Upon the anticipated in-service date of May 2017, the FSC Project will be capable of providing a minimum of 640 million cubic feet per day ("MMcf/d") of natural gas to a delivery point at an existing gas yard at Florida Power & Light Company's ("FPL") Martin Clean Energy Center in Martin County, Florida.

The proposed FSC Project consists of the construction and operation of approximately 77.1 miles of 36-inch diameter pipeline (MP 0.0 to MP 77.1) and 49.3 miles of 30-inch diameter pipeline (MP 77.1 to MP 126.4) and the construction and operation of the Martin Meter Station. The FSC Project pipeline will start in Osceola County, Florida at the interconnection with Sabal Trail within the Central Florida Hub. The pipeline will traverse Polk, Osceola, Okeechobee, St. Lucie, and Martin Counties, and terminate at the Martin Meter Station. In addition, FSC will install a pig launcher and receiver on the 36-inch diameter segment and on the 30-inch diameter segment of the FSC Project. Resource Report 1 provides a complete summary of the FSC Project facilities (Table 1.2-1) and a location map of the FSC Project facilities (Figure 1.2-1).

Resource Report 11 describes the reliability and safety aspects of the proposed FSC Project.

11.2 PIPELINE SAFETY

11.2.1 Hazards

The transportation of natural gas by pipeline may involve some degree of risk to the public in the event of an accident and subsequent release of natural gas. The greatest hazard is a fire or explosion following a major pipeline rupture, however, this risk is very low. According to the United States Department of Transportation ("USDOT") Pipeline and Hazardous Materials Safety Administration ("PHMSA"), there are 2.6 million miles of pipelines in the United States and these pipelines are the safest and most cost-efficient way to transport natural gas and hazardous materials. While the traditional measures of risk (population, energy consumption, pipeline ton-miles) have steadily increased over the past two decades, the risk of pipeline incidents with death or major injury have decreased by about 10 percent every three years and the risks of hazardous liquid pipeline spills that have environmental consequences have decreased by an average of five percent per year (PHMSA, 2013).

As presented in subsequent sections of this report, with the multiple layers of safeguards built into the design, construction and operation of the proposed pipeline, the probability for any failures is very low. To minimize such incidents, interstate natural gas pipeline facilities are designed, constructed, operated, and maintained in accordance with the PHMSA regulations, codified at, 49 Code of Federal Regulations ("CFR") Part 192. These federal safety standards, together with pipeline integrity management programs and recent advances in pipeline

manufacture, construction, and inspection techniques, minimize the potential for pipeline failure. These measures include improved public awareness initiatives, such as the "811" program, "Call Before You Dig," and other one-call programs that promote public awareness. These programs are intended to reduce third-party damage to underground utilities including buried high pressure natural gas pipelines. Additional recent advances include improved in-line inspection tool technology, which is better at assessing pipe anomalies than previous generation tools, resulting in improved information to assess and repair anomalies. Pipeline operators continue to learn from root cause analyses (RCAs) that result in improved installation and/or review procedures. RCAs are performed by pipeline operators after any incident. USDOT PHMSA continues to issue safety advisory bulletins based on industry incidents and/or their inspections.

Methane, the primary component of natural gas, is colorless, odorless, and tasteless. It is not toxic, but is classified as an asphyxiant. If breathed in high concentration, oxygen deficiency can result in serious injury or death. Methane has an ignition temperature of 1,000 degrees Fahrenheit and is flammable at concentrations between 5.0 percent and 15.0 percent in air. Unconfined mixtures of methane in air are not explosive. However, a flammable concentration within an enclosed space in the presence of an ignition source can explode. The specific gravity of methane is 0.55; therefore, it is buoyant at atmospheric temperatures.

11.2.2 Safety Standards

The Natural Gas Pipeline Safety Act, as amended (49 USC 60101 et seq.), authorizes the PHMSA to promulgate pipeline safety and design standards. The proposed FSC Project facilities will be designed, constructed, operated, and maintained to meet or exceed safety requirements PHMSA set forth in 49 CFR Part 192 "Transportation of Natural Gas and Other Gas by Pipeline: Minimum Federal Safety Standards" ("Part 192"). The regulations are intended to ensure adequate protection for the public from natural gas pipeline failures. Part 192 specifies the design, material selection, construction, operation, and maintenance of Project facilities.

Part 192 also defines area classifications, based on population density in the vicinity of the pipeline, which provide more rigorous safety requirements for populated areas. The class location unit is an area that extends 220 yards on either side of the centerline of any continuous 1-mile length of pipeline. The four area classifications are defined as follows:

Class 1: Location with 10 or fewer buildings intended for human occupancy.

Class 2: Location with more than 10 but fewer than 46 buildings intended for human occupancy.

Class 3: Location with 46 or more buildings intended for human occupancy or where pipeline lies within 100 yards of any building, or small, well-defined outside area occupied by 20 or more people during normal use.

Class 4: Location where buildings with four or more stories aboveground are prevalent.

Class locations representing more populated areas require higher safety factors in pipeline design, testing, and operation. Pipelines constructed in Class 1 locations must be installed with a minimum depth of cover of 30 inches in normal soil, and 18 inches in consolidated rock. Pipelines constructed in Class 2, 3 and 4 locations, as well as drainage ditches of public roads and railroad crossings, require a depth of cover of 36 inches in normal soil and 24 inches in consolidated rock. Class locations also specify the maximum distance to a sectionalizing block valve is 10 miles in Class 1, 7.5 miles in Class 2, 4 miles in Class 3, and 2.5 miles in Class 4 locations. Pipeline design pressures, hydrostatic test pressures, maximum allowable operating pressure, inspection and testing of welds and frequency of pipeline patrols and leak surveys

must also conform to higher standards in more populated areas. The required pipeline design pressure (and resulting wall thickness requirements and other pipeline specifications) vary with Class location as specified at 49 CFR §192.111. Table 11.2-1 shows PHSMA area classifications for the FSC Project. FSC will comply with these standards.

Part 192 prescribes the minimum standards for operating and maintaining pipeline facilities, including the requirement to establish a written operations and maintenance manual governing these activities. Under 49 CFR §192.615, each pipeline operator must also establish an emergency plan that provides written procedures to minimize the hazards associated with a gas pipeline emergency. Key elements of the plan include procedures for:

1. Receiving, identifying, and classifying emergency events - gas leakage, fires, explosions, and natural disasters;
2. Establishing and maintaining communications with local fire, police, and public officials, and coordinating emergency response;
3. Making personnel, equipment, tools, and materials available at the scene of an emergency;
4. Protecting people first and then property, and making them safe from actual or potential hazards; and
5. Emergency shutdown of system and safe restoration of service.

Each operator must establish and maintain liaison with appropriate fire, police, and public officials to learn the resources and responsibilities of each organization that may respond to a gas pipeline emergency, and coordinate mutual assistance in responding to emergencies. The operator must also establish a continuing education program to enable customers, the public, government officials, and those engaged in excavation activities to recognize a gas pipeline emergency and report it to appropriate public officials. FSC will develop an Emergency Response Plan that will meet these requirements.

11.2.2.1 High Consequence Areas

The Pipeline Safety Improvement Act of 2002 mandated that the PHMSA issue regulations that require operators of natural gas transmission pipelines to develop and implement Integrity Management Programs for pipelines in High Consequence Areas (“HCAs”). HCAs are defined and discussed further in Section 11.4.1. The PHMSA has promulgated a rule for Pipeline Integrity Management in High Consequence Areas for Gas Transmission, which requires that a facility-specific Integrity Management Plan be developed to document procedures under which pipeline integrity will be monitored and maintained for those areas where the pipeline traverses lands or facilities that are considered HCAs (49 CFR Part 192, Subpart O). Pipeline integrity management is a systematic approach for identification and mitigation of potential risks to the pipeline.

FSC will implement a comprehensive Integrity Management Program that meets or exceeds these regulations. While the pipeline integrity management regulations apply only to HCAs, FSC will implement the same rigorous practices across its pipeline system in order to identify and mitigate risks.

11.2.3 Pipeline Accident Data

PHMSA has set forth certain reporting requirements for natural gas pipelines in 49 CFR Part 191 “Transportation of Natural Gas and Other Gas by Pipeline; Annual Reports, Incident Reports, and Safety Related Condition Reports” (“Part 191”). Since June 1984, Part 191 has required all operators of transmission and gathering systems to notify PHMSA of any reportable

incident, and to submit a written report on form F7100.2 within 30 days of the incident's occurrence. A reportable incident is an incident that involves property damage valued at more than $50,000, injury, death, release of gas, or incidents that are otherwise considered significant by the operator. This report uses incidents reported during the period from 1994 through 2013.

Table 11.2-2 provides national gas transmission incidents and accidents by category from 1994 to 2013. As seen in Table 11.2-2, the category accounting for the highest percentage of gas transmission fatalities is caused by excavation damage (approximately 38 percent).

The category accounting for the most frequent cause of all reportable gas transmission incidents is material failure (approximately 28 percent). Material failure related incidents typically involve pipeline material failure, weld and/or equipment failure or malfunctioning equipment. As seen in Table 11.2-2, corrosion is the cause of approximately 17 percent of the total number of gas transmission incidents. Corrosion-related incidents usually result from internal corrosion. While pipelines installed since 1950 exhibit a fairly constant frequency of corrosion incidents, pipelines installed before that time have a significantly higher rate. Older pipelines have a higher frequency of corrosion incidents because corrosion is a time-dependent process. The corrosion potential for new pipe is further reduced by use of more advanced coatings and cathodic protection. Prior to 1971, pipelines were not required to use cathodic protection and protective coatings. The use of both an external protective coating and a cathodic protection system significantly reduces the rate of failure as compared to unprotected or partially protected pipe.

Outside force incidents result from the encroachment of mechanical equipment such as bulldozers and backhoes; earth movements due to soil settlement, washouts, or geologic hazards; weather effects such as winds, storms and thermal strains; and other forces. The breakdown of outside force incidents in Table 11.2-3 shows that human error associated with excavation damage was responsible for 15.1 percent of all onshore incidents from 1994 to 2013. Since April 1982, operators have been required to participate in "one call" public utility programs in populated areas to minimize unauthorized excavation activities in the vicinity of pipelines.

Systems for corrosion control are incorporated into the overall design of the FSC Project pipeline. Once the pipeline has been constructed, extensive ongoing corrosion control measures will be implemented to monitor and maintain the pipeline integrity, as defined in Part 192 regulations and FSC's corrosion control operating procedures.

The pipeline will be coated with an epoxy based coating. In addition, the pipeline will be protected by a cathodic protection system. This includes the application of a continuous direct current to the entire length of the pipeline to manage the potential corrosive nature of the soils and interference potential of other nearby underground facilities.

11.2.4 Impact on Public Safety

The reportable incident data summarized in Table 11.2-2 above includes reportable pipeline failures of all magnitudes with widely varying consequences. The majority of incidents were attributed to piping material, welding, equipment failure, and operator/contractor excavation damage. Information on yearly fatalities and injuries which occurred on onshore natural gas transmission lines from 1994 through 2013 is presented in Table 11.2-4.

The nationwide totals of accidental fatalities and injuries due to various transportation modes are listed in Table 11.2-5 in order to provide a relative measure of the industry-wide safety of natural gas transmission pipelines. Direct comparisons between accident categories should be made cautiously since individual exposures to hazards are not uniform among all categories. Nevertheless, the average number of fatalities resulting from natural gas transmission pipelines

is very small considering the numerous miles of onshore and offshore transmission lines in service nationwide.

11.3 SAFETY OVERVIEW

The FSC Project facilities constructed will fully adhere to Part 192 regulatory requirements pertaining to pipeline safety. These safety regulations will be reinforced by the comprehensive and strictly enforced corporate practices of FSC. The effectiveness of the federal and corporate requirements in ensuring reliability and safety is illustrated by the following operating experience profile of FSC. The empirical information presented illustrates that the potential for public hazard from accidents associated with the operation of the proposed FSC Project facilities is low.

11.3.1 System Overview

FSC's parent company, NextEra Energy, Inc. ("NextEra"), owns and operates 102 miles of natural gas and oil pipelines and one natural gas compressor station. NextEra has been providing pipeline services since 1978 for oil pipelines and 1985 for natural gas pipelines.

11.3.2 Historical Operating Record

Generally, the natural gas transmission industry has an excellent record of public safety. Pipelines and related facilities are designed and maintained with strict adherence to Part 192 standards to ensure public safety, reliability, and to minimize the opportunity for system failure.

FSC's parent Company, NextEra has an excellent record of public safety. NextEra has an established record operating intrastate oil and gas pipelines and FSC will continue to employ proper system design, construction, operation, and maintenance practices to ensure this excellent record is maintained.

11.4 MEASURES TO PROTECT THE PUBLIC AND UTILITIES

11.4.1 High Consequence Area Identification

Integrity management regulations require pipeline companies like FSC to identify HCAs located along the pipeline. HCAs are designated locations along the pipeline that are near either densely populated areas, facilities that would be difficult to evacuate (such as hospitals or schools), or locations where people congregate (such as churches, offices or parks). The federal regulations include specific criteria for pipeline companies to identify and designate HCAs.

FSC uses a number of methods to look for HCAs to assure that it identifies all HCAs along its pipeline, including aerial photography, field surveys, consultation with emergency response officials, as well as multiple database searches. FSC will perform a comprehensive review as needed to assure that its identification of HCAs remains accurate.

HCAs are identified as an area established by one of the methods described below:

- Class 3 and 4 Locations;
- Class 1 or 2 Locations where the potential impact radius is greater than 660 feet and the area within a potential impact circle contains 20 or more buildings intended for human occupancy; or
- An identified site such as:
    - (1) an outside area or open structure that is occupied by 20 or more persons for at least 50 days in any 12-month period;

- (2) a building that is occupied by 20 or more persons for at least five days a week for 10 weeks in a 12-month period; or
- (3) a facility occupied by persons who are confined, are of impaired mobility, or would be difficult to evacuate.

The potential impact radius means the radius of a circle within which the potential failure of a pipeline could have significant impact on people or property. The potential impact radius is determined by the formula r = 0.69 x (square root of ($p \times d^2$)), where 'r' is the radius of a circular area surrounding the point of failure, 'p' is the maximum allowable operating pressure in the pipeline segment in pounds per square inch, and 'd' is the nominal diameter of the pipeline in inches.

Table 11.4-1 shows the potential HCAs along the proposed FSC Project facilities.

The FSC Project facilities will be designed, constructed, operated, and maintained to meet or exceed regulations set forth in Part 192.

11.4.2 Data Gathering

The risk analysis process involves the use of data about the pipeline, potential activities near the pipeline and potential consequences in the unlikely event of a pipeline failure. This data is needed to properly identify integrity risks and potential consequences and is gathered from a number of sources, including:

- Original construction records
- Original metallurgical records
- Pipeline alignment sheet records
- Personnel interviews
- USGS Quadrangle maps
- Digital elevation models
- Historical data
- Database searches
- Leak and incident data/reports
- Operating characteristics
- Corrosion monitoring
- Cathodic protection surveys
- Subject matter experts
- One-call notices
- Aerial photography

11.4.3 Risk Assessment

FSC will routinely perform a detailed risk analysis for its pipeline system to identify potential integrity threats to the pipeline and potential consequences in the unlikely event of a pipeline failure. This risk analysis will allow FSC to prioritize integrity management activities, such as integrity assessments and additional prevention measures, to those pipeline segments that have higher risks. Examples of potential integrity threats could include:

- Excavation damage by third parties;
- Metal loss or corrosion;
- Defects related to pipe manufacturing process;
- Cracking related to exposure to natural environments; and
- Operation records of facilities.

The risk assessment is performed by subject matter experts using computerized risk modeling tools and techniques to assure the risk assessment process provides an accurate determination of pipeline risks.

11.4.4 Baseline Integrity Assessments

Baseline Integrity assessments are performed on the pipeline to identify pipeline conditions well before they could become a threat. The integrity assessment method for each pipeline segment is selected based on the types of potential integrity threats applicable to that segment. The integrity assessment methods could include:

- In-Line Inspection – an assessment method that uses an internal inspection tool (commonly referred to as a "Smart Pig") that is capable of identifying and classifying pipe defects, including metal loss, dents, gouges and other types of defects. The Smart Pig is inserted into the pipeline and is typically pushed by the flow of natural gas in the pipeline.
- Direct Assessment – an assessment method that uses a systematic approach to identifying potential defects through data review, indirect assessments and targeted hands-on inspections.
- Pressure Testing – an assessment method where the pipeline is filled with an inert substance, typically water, and is tested to a pressure that is well above the normal operating pressure to validate the strength of the pipe and identify any smaller defects long before they could become a threat.

11.4.5 Response and Remediation

Pipeline defects identified by the integrity assessments are prioritized and scheduled for field investigation and repair, if required, in accordance with the integrity management regulations and standards issued by the American Society of Mechanical Engineers, the National Association of Corrosion Engineers, other consensus standards, and industry best practices. FSC will schedule and conduct investigations and repairs for any potential defects that exceed specified thresholds. This will be done regardless of whether or not the pipeline is located in a designated HCA.

11.4.6 Preventive and Mitigative Measures

Preventive measures begin with the design and construction of FSC's facilities. These measures include design specifications, selection of suitable piping materials, development and selection of welding procedures, pipe coatings and cathodic protection systems. Additionally,

manufacturing controls are used to promote high-quality installation of the pipeline and to limit operating stress. During the installation phase, all welders and radiographic technicians performing work on the facilities must take and pass a qualification test on the welding procedures used for construction. Qualified field Welding and Construction inspectors are used to monitor the installation of the facilities.

In roadways, streets, and parking lots, a 15:1 sand to concrete mix called flowable fill, or Controlled Density Fill, or clean compacted material will be used as backfill around the pipeline following consultation with municipal and state roadway authorities. A 2-foot wide brightly colored warning tape is placed 1 foot below natural grade along the length of the pipeline. A variety of pipeline location markers (e.g. adhesive decals, marker posts, and signs) will be used to clearly identify the location of the pipeline and provide contact information for the public and parties excavating in the area.

The pipeline will be patrolled on a routine basis and personnel well-qualified to perform both emergency and routine maintenance on interstate pipeline facilities will handle emergencies and maintenance related to:

- Erosion and wash-outs along the right-of-way;
- Settling, undermining, or degradation of repaired ditch line in streets or parking lots;
- Performance of water control devices such as diversions;
- Prevent the growth of woody vegetation;
- Condition of banks at stream and river crossings;
- Third-party activity along the pipeline right-of-way; and
- Any other conditions that could endanger the pipeline.

11.4.6.1.1 Continuous Evaluation and Improvement

FSC will continually refine and enhance the integrity management techniques as it implements the Integrity Management Program on its pipeline system.

11.4.7 Public Safety

FSC is committed to safety, protecting the environment and preventing accidents/incidents and maintaining the highest standards for its pipeline operation and maintenance and will accomplish this goal through routine preventative maintenance, pipeline patrols, solid emergency response plans and a strong pipeline integrity management program. FSC will establish and maintain strict operating and maintenance policies and procedures that will be audited periodically by the PHMSA and are in compliance with Part 192.

Trained and qualified pipeline personnel will operate and maintain the pipeline in accordance with Subpart N of Part 192. The training program will ensure all personnel possess the knowledge and competency necessary to efficiently operate and maintain the pipeline in a manner that protects the environment, the public and the health and safety of all employees. More specifically, personnel are trained to: execute normal operating and maintenance procedures; recognize abnormal conditions and take appropriate corrective actions; predict consequences of malfunctions or failures; recognize conditions likely to cause emergencies; respond to emergency situations; control accidental releases of gas; and recognize characteristics and hazards of gas.

During construction, special care will be taken in residential and commercial areas to minimize neighborhood and traffic disruption, to control noise and dust to the extent practicable, and to

protect the public at large. Measures to be implemented where the pipeline traverses near residential areas include, but are not limited to: fencing the construction work area boundary to ensure construction equipment, materials, and spoil remain in the construction right-of-way; ensuring piping is welded and installed as quickly as reasonably possible consistent with prudent pipeline construction practices to minimize construction time affecting a neighborhood; backfilling the trench as soon as possible after the pipe is laid; and completing cleanup and installation of permanent erosion control measures within 10 days after the trench is backfilled, weather conditions permitting.

FSC will work to minimize leaving overnight open excavations by backfilling the installed pipeline to near the end of the section, and covering the remaining open trench with temporary steel plating. The work will be accomplished so emergency vehicles will be able to pass and homeowners will be able to access their driveways; steel plates will be available to insure access. FSC has developed residential construction plans in areas where residential dwellings are within 50 feet of construction workspace and these plans have been filed with the FERC.

Leakage surveys will be conducted on the pipeline at prescribed intervals to identify leakage, as required by PHMSA. Additional surveys will be conducted periodically to identify any anomalies in the pipeline.

11.4.8 Emergency Response

Consistent with 49 CFR §192.615, FSC will establish an emergency action plan that provides written procedures to minimize the hazards from a pipeline emergency. Key features will include:

- Receiving, identifying, verifying and classifying emergency events – leaks, fires, explosions or natural disasters;
- Managing communications with emergency responders and public officials to establish incident command and coordinate response efforts;
- Making personnel, equipment, tools and materials available for emergencies;
- Ensuring that response efforts focus on public safety first; and
- Ensuring Emergency shutdown actions are taken in a timely manner

Should the need arise, FSC will have field service personnel and repair contractors available that are capable of completing emergency repairs and restoration.

11.4.9 Public Awareness Program

FSC will develop a Public Awareness Program as outlined in 49 CFR §192.616, which will provide outreach measures to the affected public, and emergency responders and public officials. This program will use multi-media channels (direct mail, e-mail, social networking, public service announcements, print advertisement, and public meetings, etc.) to engage these core audiences.

FSC's objective is to educate the public on how to recognize the presence of pipelines; understand the potential hazards and safe actions they should take; recognize and report abnormal conditions; and encourage the safe behavior of calling for buried facility location before digging.

11.4.10 One-Call Response

When FSC receives notification from a one-call center that someone intends to dig near its pipeline facilities, personnel will be dispatched to mark the location of the facilities in the vicinity

of proposed digging or other earth disturbance activities and, if necessary, company employees will be on-site when the excavation occurs.

11.4.11 Pipeline Safety Brochures

FSC will mail information brochures to homeowners, businesses, potential excavators, and public officials along the pipeline system each year to inform them of the presence of the pipeline and instruct them on how to recognize and react to unusual activity in the area. These brochures provide emergency contact phone numbers available 24/7 and reinforces the need for excavators to “call before you dig”.

In addition to these outreach efforts, FSC will also provide pipeline location information in the National Pipeline Mapping System to inform the public and others as to the general location of our pipeline facilities.

11.4.12 Contact Information

As part of its Emergency Response Plan FSC will provide contact information.

11.4.13 Interactions with Federal Authorities

FSC will maintain frequent contact with the PHMSA. The PHMSA routinely exercises its oversight authority to ensure that facilities under its jurisdiction are safely designed, constructed, and operated.

1. PHMSA develops regulations and other approaches to risk management to assure safety in design, construction, testing, operation, maintenance, and emergency response of pipeline facilities.
2. PHMSA administers a national regulatory program to assure the safe transportation of natural gas, petroleum, and other hazardous materials by pipeline. PHMSA will routinely inspect FSC’s pipeline facilities and records for compliance with design, construction, testing, operations, maintenance, and integrity regulations. FSC’s procedures and practices will meet or exceed the pipeline safety regulations and related risk management requirements administered by the PHMSA.

11.4.14 Liaison Procedures with Local Authorities

FSC’s personnel involved with public awareness will ensure that appropriate liaisons and public education is established and maintained in the communities within which FSC operates. FSC will establish open relationships with local fire, police, and other governmental leaders in order to efficiently respond in a cooperative manner to pipeline emergencies.

To accomplish this FSC, on an annual basis, will:

- Have informational meetings and training with local fire and police departments, and other concerned government agencies at their request;
- Conduct periodic emergency response drills and table top exercises to build familiarity with emergency response personnel and response measures to be taken; and
- Provide literature listing emergency contact phone numbers and other pertinent information.

In addition to maintaining contact with local governmental and emergency response agencies along the pipeline, FSC’s liaison efforts will allow FSC to:

- Determine how local officials may be able to assist FSC during an emergency with the determination of jurisdiction and resources that may be involved in responding to an emergency;
- Familiarize local officials with how FSC responds to an emergency on its pipeline system;
- Verify notification preferences for pipeline emergencies; and
- Review with local officials the use of incident command system to cooperate and assist with response to an emergency.

Outreach to emergency responders will be conducted by FSC on a periodic basis. FSC's focus with these organizations is to review firefighting methods and techniques for natural gas fires to conduct periodic emergency drills and exercises.

11.4.15 Utility Protection

The majority of the proposed pipeline segments for the FSC Project will be within or adjacent to existing rights-of-way, public roadways, and/or other utility rights-of-way. Some portions of the pipeline segments deviate from existing rights-of-way, generally to avoid specific construction constraints, provide adequate separation from existing residences, or to reduce impacts to sensitive resources.

Prior to construction, existing utility lines and other sensitive resources, identified in easement agreements or by federal and state agencies, will be located and marked to prevent accidental damage during pipeline construction. FSC's contractors will contact the "Sunshine 811" system to verify and mark all utilities along the FSC Project workspaces to minimize the potential for damage to other buried facilities in the area. Where there is a question as to the location of utilities (i.e. water, cable, oil, gas, product, and sewer lines), they will be located by field instrumentation and/or test pits.

11.4.16 Other Protection Measures

11.4.16.1 Surveys

FSC will employ an array of patrol methods to conduct comprehensive and effective patrols. Aerial, driving, or foot patrols will be used to physically inspect the pipeline facilities. FSC will have line field service crews that perform the ground based patrols and facility inspections. When performing patrols, technicians will observe surface conditions on and adjacent to the pipeline right-of-way for indications of leaks, construction activity, and other factors affecting safety and operation. Conditions identified during patrols will be entered into FSC's work management system and remedial actions taken. Preventative maintenance checks shall be performed on the pipeline at a set frequency and shall be compliant with Part 192 safety regulations.

FSC will become be a member of Sunshine State One Call of Florida ("SSOCOF") known as Sunshine 811, which is a not for profit corporation. Its main purpose is to assist with preventing damage to underground facilities. As a member, FSC will have two main areas of responsibility:

1. Respond to conflict tickets provided by SSOCOF from their toll-free number, 811 and (800) 432-4770. FSC personnel will determine if facilities are located in the area and dispatch technicians to locate its pipeline facilities.
2. FSC, through their Public Awareness Program, will promote pipeline safety awareness to affected land owners and commercial excavators.

The pipeline will also have sufficient pipeline markers to provide visual indication of buried pipeline locations to others. Proper signage will be placed along the right-of-way, particularly at access points such as road and river crossings. The markers will include a 24-hour emergency telephone number to the FSC Pipeline Control facility located in Juno Beach, FL.

FSC will construct the pipeline such that minimum depth of earthen cover will be in accordance with Part 192. Depth of earthen cover shall be periodically monitored and measured to ensure the pipeline is below the depth of scour at major stream and canal crossings and deep enough to avoid being damaged from land use practices such as agricultural activities, routine construction or cleaning.

11.4.16.2 Equipment

FSC's pipeline system includes many equipment features that are designed to increase the overall safety of the system and protect the public from a potential failure of the system due to accidents or natural catastrophes.

Cathodic protection systems will be installed at various points along the pipeline to mitigate corrosion of the pipeline facilities. The cathodic protection system impresses a low voltage DC current to the pipeline to off-set natural soil and groundwater corrosion potential. The functional capability of cathodic protection systems will be inspected bi-monthly to ensure proper operating conditions for corrosion mitigation.

FSC's pipeline will be built according to Part 192. Since the pipeline is buried at least 30 inches, it is relatively immune from direct lightning strikes. Specific site conditions, including earthquakes, are considered in the design of the pipeline. The magnitude of earthquakes in the southeast is relatively low and the ground vibration would not pose a problem for a modern welded-steel pipeline.

FSC's proposed pipeline will be equipped with remote control valves as required by Part 192. This allows the valves to be operated remotely by the Pipeline Control Center in Juno Beach in the event of an emergency, usually evidenced by a sudden loss of pressure or flow on the pipeline. Remotely closing the valve allows the section of pipeline to be isolated from the rest of the pipeline system.

Data acquisition systems will be installed at the metering and regulation ("M&R") station as well as at sectionalizing block valves. If system pressures fall below predetermined ranges, alarms are activated alerting the FSC Pipeline Operators.

11.4.16.3 Operations and Maintenance

The Pipeline Control Center will be located in Juno Beach, Florida and will be staffed continuously by qualified pipeline operators. Operators will monitor all aspects of the pipeline including system pressures, temperatures, flows, and valve positions (open or closed). A secondary Pipeline Control Center will be available in cases of an emergency at Riviera Beach, Florida.

The pipeline will be monitored for leaks continuously using the data acquisition system. Operators will use pressures, flows and rate of change alarms to monitor for leaks or other abnormal operating conditions. In the unlikely case that a shutdown of the pipeline system is needed, the FSC Pipeline system will be equipped with remotely controlled sectionalizing block valves to isolate the affected pipeline segment.

Part 192 prescribes the minimum standards for operating and maintaining pipeline facilities, including the establishment of a written plan governing these activities. FSC will develop an Operations & Maintenance ("O&M") Manual for the facility during the construction phase and this O&M Manual will be in effect prior to initial filling of the pipeline system with natural gas.

FSC will have field services crews to perform Part 192 required operations, maintenance and inspection tasks along the 126 mile long pipeline. All personnel will have the proper training and qualifications as required by Part 192.

11.4.16.4 Corrosion Control

The FSC pipeline will have cathodic protection and will be closely monitored and maintained in compliance with Part 192 and NACE International (National Association of Corrosion Engineers) recommended practice RP-0169-96. The pipeline will have a high quality fusion-bonded epoxy ("FBE") coating systems which will be applied during the pipe manufacturing process. Girth welds will be sandblasted and coated with a field applied FBE coating. Together, the combination of Cathodic Protection and FBE coating system provide excellent corrosion control.

In addition to the other measures, FSC will also inspect the pipeline using devices known in the industry as "smart pigs" every 7 years, or more frequently if Baseline Integrity Assessment requires. These devices run inside the pipe and provide indications of internal and external metal loss, deformation, ovalities, dent detection; valve, fitting and casing locations; pipe repairs; casing ovalities; and external metal objects in the vicinity of the pipeline.

11.5 REFERENCES

[PHMSA] Pipeline and Hazardous Materials Safety Administration. 2013. Written Statement of Cynthia L. Quarterman, Administrator PHMSA, Before the Committee on Commerce, Science, and Transportation United States Senate. Field Hearing—Charleston, WV. *Pipeline Safety: An On-the-Ground Look at Safeguarding the Public*. January 28, 2013.

TABLES

Table 11.2-1

PHMSA Area Classifications Along the FSC Project a/

County	Beginning MP	Ending MP	Approximate Length (feet)	Class Location (1, 2, 3, or 4)
Osceola	0.0	5.2	27,456	Class 3
Polk	5.2	5.7	3,696	Class 3
	5.7	10.9	27,112	Class 1
	10.9	11.3	2,102	Class 2
	11.3	12.4	6,095	Class 3
	12.4	23.6	58,938	Class 2
	23.6	25.0	7,696	Class 3
	25.0	27.9	15,045	Class 2
	27.9	28.9	5,352	Class 3
	28.9	29.5	3,184	Class 2
	29.5	31.0	7,904	Class 3
	31.0	32.2	6,147	Class 2
	32.2	35.7	18,530	Class 3
	35.7	38.1	13,000	Class 2
	38.1	38.9	3,885	Class 1
	38.9	39.5	3,485	Class 2
	39.5	41.8	11,825	Class 1
	41.8	41.9	554	Class 3
	41.9	43.9	10,670	Class 1
	43.9	44.4	2,640	Class 2
	44.4	49.9	29,252	Class 1
	49.9	51.3	7,371	Class 2
	51.3	51.5	894	Class 3
	51.5	72.0	108,154	Class 1
Osceola	72.0	73.6	8,441	Class 3
	73.6	84.3	56,496	Class 1
	84.3	85.4	5,960	Class 3
	85.4	86.6	6,262	Class 2
	86.6	88.4	9,564	Class 1
	88.4	88.7	1,374	Class 2
	88.7	93.8	27,082	Class 1
	93.8	94.7	4,701	Class 3
	94.7	109.2	76,534	Class 1
St. Lucie	109.2	109.3	711	Class 2
	109.3	118.0	46,017	Class 1

Table 11.2-1 PHMSA Area Classifications Along the FSC Project a/				
County	**Beginning MP**	**Ending MP**	**Approximate Length (feet)**	**Class Location (1, 2, 3, or 4)**
Martin	118.0	118.8	3,907	Class 3
	118.8	126.4	40,096	Class 1
a/ Classifications based on 2014 survey				

Table 11.2-2

PHMSA Incident Summary, 1994 through 2013
(Gas Transmission Onshore Incidents by Cause)

Reported Cause of Incident	Number of Incidents a/	Fatalities	Injuries
Corrosion	255	13	6
Excavation Damage	346	15	42
Human Error	45	0	9
Material Failure	429	8	70
Natural Force Damage	133	0	2
Other Outside Force Damage	96	0	13
Other Causes	228	3	46
Total	**1,532**	**39**	**188**

a/ Includes all reported incidents
Source: U.S. Department of Transportation. Pipeline and Hazardous Materials Safety Administration ("PHMSA") internet site: http://primis.phmsa.dot.gov/comm/reports/safety/Allpsi.html?nocache=8154#_ngtranson

TABLE 11.2-3

Outside Force Incidents by Cause 1994 - 2013

Cause	Percentage of All Onshore Incident Types
Third Party Excavation Damage	15.1
Earth Movement	2.4
Heavy Rains/Floods	1.7
Other Outside Forces	5.0

Source: U.S. Department of Transportation. Pipeline and Hazardous Materials Safety Administration. Online: http://primis.phmsa.dot.gov/comm/reports/safety/ALLPSIDet_1994_2013_US.html?nocache=1048#_ngtranson

Table 11.2-4

Natural Gas Transmission Systems Fatalities and Injuries - 1994 - 2013

Year	Fatalities	Injuries
1994	0	22
1995	2	7
1996	1	5
1997	1	5
1998	1	11
1999	2	8
2000	15	16
2001	2	5
2002	1	4
2003	1	8
2004	0	2
2005	0	5
2006	3	3
2007	2	7
2008	0	5
2009	0	11
2010	10	61
2011	0	1
2012	0	7
2013	0	2
Total	**41**	**195**

Source: U.S. Department of Transportation. Pipeline and Hazardous materials Safety Administration. Online: http://primis.phmsa.dot.gov/comm/reports/safety/SerPSI.html?nocache=7105#_ngtrans

FLORIDA SOUTHEAST CONNECTION

Table 11.2-5

Transportation Fatalities and Injuries in the US by Mode 1995 - 2012

	Air		Highway		Railroad		Transit		Waterborne		Gas Transmission Pipeline a/	
Year	***Fatalities***	***Injuries***	***Fatalities***	***Injuries***	***Fatalities***	***Injuries***	***Fatalities***	***Injuries***	***Fatalities***	***Injuries***	***Fatalities***	***Injuries***
1995	963	452	41,817	3,465,279	691	12,744	94	12,565	1,016	6,165	2	7
1996	1,093	467	42,065	3,483,319	662	11,130	80	12,717	906	6,064	1	5
1997	724	417	42,013	3,347,614	685	10,443	80	13,388	989	5,737	1	5
1998	670	369	41,501	3,192,035	683	10,325	79	12,147	1,033	5,321	1	11
1999	683	406	41,717	3,236,238	623	10,493	101	10,957	928	4,992	2	8
2000	764	359	41,945	3,188,750	631	10,614	110	12,201	888	5,112	15	16
2001	1,166	368	42,196	3,032,672	656	9,990	80	11,878	828	5,008	2	5
2002	616	337	43,005	2,925,758	680	10,296	86	5,391	863	4,856	1	4
2003	699	367	42,884	2,888,601	616	8,376	66	4,726	833	4,666	1	8
2004	637	302	42,836	2,788,378	635	8,273	82	5,386	822	4,066	0	2
2005	603	305	43,510	2,699,000	626	8,677	57	4,434	835	4,095	0	5
2006	774	286	42,708	2,575,000	636	7,898	40	5,399	839	4,245	3	3
2007	540	291	41,259	2,491,000	624	8,830	65	5,638	811	4,422	2	7
2008	567	296	37,423	2,346,000	605	8,224	75	8,003	827	3,947	0	5
2009	548	301	33,883	2,217,000	534	7,420	103	6,579	839	3,931	0	11
2010	476	277	32,999	2,239,000	597	7,659	109	7,844	765	3,867	10	61
2011	489	362	32,479	2,217,000	550	7,580	106	5,436	820	3,831	0	1
2012 (P)	447	276	33,561	2,362,000	561	7,570	U	U	714	3,688	0	7

U – Data Unavailable; P – Preliminary

Sources:

a/ U.S. Department of Transportation Pipeline and Hazardous Materials Safety Administration
http://primis.phmsa.dot.gov/comm/reports/safety/SerPSI.html?nocache=2733#_ngtrans

U.S. Department of Transportation Research and Innovative Technology Administration Bureau of Transportation Statistics
http://www.rita.dot.gov/bts/sites/rita.dot.gov.bts/files/publications/national_transportation_statistics/index.html

Table 11.4-1 Location of High Consequence Areas along the FSC Project			
County	**Beginning MP**	**Ending MP**	**Approximate Length (feet)**
Osceola	0.0	5.2	27,456
Polk	5.2	5.7	3,696
	11.3	12.4	6,095
	23.6	25.0	7,696
	27.9	28.9	5,352
	29.5	31.0	7,904
	32.2	35.7	18,530
	41.8	41.9	554
	51.3	51.5	894
Osceola	72.0	73.6	8,441
Okeechobee	84.3	85.4	5,960
	93.8	94.7	4,701
Martin	118.0	118.8	3,907