BEFORE THE FLORIDA PUBLIC SERVICE COMMISSION

In Re: Petition on behalf of Citizens of the State of Florida to require Progress Energy Florida, Inc. to refund to customers $143 million

DOCKET NO. 060658
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DIRECT TESTIMONY OF JON FRANKE ON BEHALF OF PROGRESS ENERGY FLORIDA

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IN RE: PETITION ON BEHALF OF CITIZENS OF THE STATE OF FLORIDA TO REQUIRE PROGRESS ENERGY FLORIDA, INC. TO REFUND CUSTOMERS $143 MILLION

FPSC DOCKET NO. 060658

DIRECT TESTIMONY OF

JON FRANKE

I. INTRODUCTION AND QUALIFICATIONS

Q. Please state your name and business address.

A. My name is Jon Franke. My business address is 15760 W. Powerline St., Crystal River, FL 34442.

Q. By whom are you employed and in what capacity?

A. I am employed by Progress Energy Florida, Inc. ("PEF" or the "Company") in the Nuclear Generation Group and serve as Plant General Manager at Crystal River Unit 3 ("CR3"), PEF's nuclear plant.

Q. What do you do?

A. As Plant General Manager I am responsible for the safe operation of the nuclear generating station. The Operations, Maintenance, Scheduling, Radiation Protection and Chemistry units report to me. Through my management team I have about 300 employees that perform the daily work required to operate the station.

Q. What is the purpose of your testimony?

A. My testimony will explain the impact of bringing Powder River Basin ("PRB") coal to the Crystal River site with respect to PEF's nuclear unit, Crystal River 3 ("CR3"). Such a change in coal selection represents a significant challenge to my facility. There are major nuclear plant concerns that must be addressed before PRB coal could even be considered for wide-scale use at the Crystal River Energy Complex. My testimony will discuss those concerns and explain what would be required before any significant amount of PRB coal could be allowed at the Crystal River site.

Q. Please describe your education background and professional experience.

A. I have a Bachelor's degree in Mechanical Engineering from the United States Naval Academy at Annapolis. I have a graduate degree in the same field from the University of Maryland and a Masters of Business Administration from the University of North Carolina at Wilmington.

I have over 20 years of experience in nuclear operations. I received training by the US Navy as a nuclear officer and oversaw the operation and maintenance of a nuclear aircraft carrier propulsion plant during my service. Following my service in the Navy I was hired by Carolina Power and Light and have been with the company through the formation of Progress Energy. My early assignments involved engineering and operations, including oversight of the daily operation of the Brunswick nuclear plant as a Nuclear Regulatory Commission ("NRC") licensed Senior Reactor Operator. I was the Engineering Manager of that station for three years prior to assignment to my present job, approximately five years ago.

Q. Are you sponsoring any exhibits with your testimony?

A. Yes, I am sponsoring the following exhibits that were prepared by me or prepared under my direction.

- Exhibit No. __ (JF-1), which is an aerial photograph of the Crystal River site;
- Exhibit No. __ (JF-2), which is a composite exhibit of pictures of the barge unloader, which were taken from various places at CR3;
- Exhibit No. __ (JF-3), which is a composite exhibit of pictures of various points along the conveyor belt that would transport PRB coal, which were taken from CR3;
- Exhibit No. __ (JF-4), which is a picture taken of CR3 from the tripper floor at CR4;
- Exhibit No. __ (JF-5), which is a picture taken of CR3 from a conveyor belt that would transport the PRB coal;
- Exhibit No. __ (JF-6), which is a diagram of the transmission lines that provide power to the CR3 nuclear unit;
- Exhibit No. __ (JF-7), which is a composite exhibit of pictures of transmission lines at Crystal River as they cross over the conveyor belts;
- Exhibit No. __ (JF-8), which is an analysis of the steps taken to evaluate a proposed change at a nuclear facility;
- Exhibit No. __ (JF-9), which is a list of the risks that would require analysis pursuant to the CR3 operating license before significant quantities of PRB coal could be brought onto the Crystal River site.

These exhibits are true and correct.

Q. Please summarize your testimony.

A. The use of significant quantities of PRB coal at the Crystal River Energy Complex may cause a reduction in the safety margin at the nuclear plant which would need to be evaluated by the Company. The characteristics of PRB coal are vastly different from the bituminous coal currently handled, burned and stored at the Crystal River Energy Complex. The risk of spontaneous combustion, as well as the increased production of flammable PRB dust, present additional hazards and risks that may not have been previously analyzed in PEF's original nuclear operating license.

As the nuclear plant general manager, I believe that the use of significant quantities of PRB coal is not prudent in the vicinity of a nuclear plant. Frankly, I would not want this volatile PRB coal in the vicinity of the CR3 nuclear unit on a long-term basis. I have had my licensing group contact every nuclear plant that is sited with a coal facility. No similar condition, i.e. having PRB coal on-site with a nuclear facility, exists or has been evaluated.

If PRB coal was to be used at the Crystal River site on a long-term basis, the NRC would oblige the Company to evaluate whether this change in coal would result in more than a minimal increase in risk. This evaluation is rigorous and will likely require months of engineering analysis and study. The unique nature of the situation, because to my knowledge no other nuclear unit has ever evaluated the risks of PRB coal near the unit, means that this analysis will be that much more time-consuming and difficult. After the evaluation, if the Company finds that, even with mitigation

strategies, the use of PRB coal would cause a more than minimal increase in risk to plant safety under 10 C.F.R. 50.59, then the Company would have to submit a license amendment request to the NRC. At this point, because PEF has not completed the extensive evaluation, I cannot say whether a license amendment application and formal NRC approval would be required. Whether formally or informally, I would expect the NRC would want to review this change, along with PEF's proposed solutions.

What is clear is that this sort of risk has not been analyzed before by the NRC, and there is no certainty in how the NRC will react to it. Before PEF could bring the PRB coal onto the site, it would have to make any required modifications and upgrades identified by the engineering reviews to ensure the change can be implemented safely.

II. GENERAL OVERVIEW OF CRYSTAL RIVER 3 NUCLEAR UNIT

Q. Please describe the Crystal River Site.

A. The Crystal River complex is a 4,700 acre site located in Citrus County, Florida that contains four coal-fired generating units, one nuclear generating unit, and related support facilities, such as fuel transportation and storage facilities.

Q. Please describe the Crystal River 3 ("CR3") nuclear unit.

A. CR3 is a B&W pressurized water reactor that includes a Primary and Secondary System. It currently produces approximately 838 MWe of electricity. CR3 came online in early 1977. The unit generates power onto the 500 kV grid and receives

power from two independent 230 kV lines that come into a switchyard located just north of the CR3 Reactor Building. That switchyard, in turn, is supplied by several 230 KV transmission lines.

The major physical difference between CR3 and other steam electric plants is the equipment used to create the steam. Rather than having a simple oil or coal boiler, CR3 uses a nuclear reactor and support systems to create heat to produce that steam. Those components are housed primarily in the Reactor Building and Auxiliary Building.

Q. Please describe the CR3 nuclear unit, as well as its source of offsite power, in relation to the other units and equipment located at the Crystal River site.

A. The CR3 nuclear unit is located east of two of the coal-burning units, Crystal River Units 1 and 2 ("CR1" and "CR2," respectively). The three units share a common set of intake and discharge canals. That common intake canal acts as the northern boundary of the south coal yard and the coal receiving area. Barges use that intake to transport coal to the station.

CR3's Reactor Building is approximately 1,140 feet from the barge unloader, where OPC alleges that PEF should be offloading 100% PRB coal. The coal pile at which PEF would have to temporarily store PRB coal during offloading is located just south of the barge unloader, about 1,520 feet from the CR3 Reactor Building. This coal yard is approximately 1,900 feet from CR3's switchyard. At the closest point, the conveyor belts that transport the coal from the barge unloader to the north coal yard are located as close as 620 feet from the CR3 Reactor Building. The coal

pile used to store the coal for use in Crystal River Units 4 and 5 ("CR4" and "CR5," respectively) lies 3,000 feet to the northeast of CR3 and approximately 1,500 feet from the switchyard. This coal yard is also where PEF would have to blend the 100% PRB coal with bituminous coal, as alleged by OPC in its Petition.

The railcar coal unloader is approximately 950 feet to the southeast of the CR3 Reactor Building. CR4 and CR5, at which OPC contends PEF should have been burning a blend of 50/50 PRB coal, are located 3,450 feet from the CR3 Reactor Building. Therefore, the nuclear plant would be virtually surrounded on three sides by this volatile PRB coal. These distances and the layout of the Crystal River site are reflected in Exhibit No. __ (JF-1).

To further illustrate, attached as composite Exhibit No. __ (JF-2) are pictures of the barge unloader, which were taken from various places at CR3. Attached as composite Exhibit No. __ (JF-3) are pictures of various points along the conveyor belt that would transport PRB coal, again taken from CR3. Exhibit No. __ (JF-4) is a picture taken of CR3 from the tripper floor at CR4. Exhibit No. __ (JF-5) is a picture taken of CR3 from a conveyor belt that would transport the PRB coal.

Regarding the location of the 500 kV and 230 kV lines that supply power to the CR3 switchyard, these lines run east from the CR3 unit and switchyard and cross directly over the conveyor belts that transport coal to the north coal yard. These lines are only about 20 to 25 feet in the air above these conveyor belts. The northernmost transmission line, a 230kV line, runs only about 100 feet to the south of the north coal yard. A diagram of these transmission lines is shown in my attached Exhibit No. __

(JF-6). Composite Exhibit No. __ (JF-7) shows some of these transmission lines as they cross over the conveyor belts.

Q. Is there an agency that regulates nuclear plants like CR3?

A. Yes, the federal NRC regulates and licenses nuclear units. NRC enforces strict safety regulations for the operation of nuclear units.

Q. Please explain the NRC's licensing process, including how and when an operating license must be modified.

A. When applying to receive an initial operator's license, the applicant must present detailed information about the unit, including an analysis of certain types of risks that may affect the unit's safe performance. Included within that analysis is a description of the design basis of the plant and how the plant will respond to and handle each challenge to safe plant operation. The details of plant design, construction, operation, geography, location, geology, environmental hazards and many other factors must meet strict requirements.

Important to this analysis is the requirement that the nuclear operator, or licensee, must understand any risks to nuclear plant safety such as those risks imposed by nearby activities. This can include risks created by neighboring industrial facilities or the plant's proximity to natural hazards. After thorough review of the design basis and the various risks that could affect the plant, an operating license is issued. The license includes specifications and requirements that are specific to the nuclear plant. When a change to either the nuclear plant or the plant's surrounding

environment is contemplated, the plant operator must evaluate whether the change is something that will affect the safety of the plant.

If the plant operator finds that the change may increase the probability of a potential risk, or that the change may increase the severity of a risk, then the operator must engage in a rigorous analysis under 10 CFR 50.59. Subsection (c)(2) of this regulation states that "a licensee shall obtain a license amendment . . . prior to implementing a proposed change, test, or experiment if the change, test, or experiment would: (i) Result in more than a minimal increase in the frequency of occurrence of an accident previously evaluated in the final safety analysis report (as updated); (ii) Result in more than a minimal increase in the likelihood of occurrence of a malfunction [of equipment important to safety as it had previously been reviewed by NRC]; or (iii) Result in more than a minimal increase in the consequences of an accident previously evaluated in the final safety analysis report (as updated)."

After the licensee completes this detailed engineering analysis, it must decide whether the proposed change can be mitigated such that there will be no more than a minimal increase in the likelihood or severity of an accident or malfunction. If it finds that it passes the test set forth in 10 C.F.R. 50.59, the licensee does not need to seek a license amendment from NRC.

If, however, the licensee concludes that the change would result in more than a minimal increase, then the licensee must submit a license amendment application to NRC pursuant to 10 CFR 50.90. As part of the application, the licensee must identify the proposed change and present all proposed modifications to the plant that are necessary to show no undue risk will be presented to the plant and the plant operator

will be subject to lengthy review by the NRC staff prior to the plant being able to implement that change to the facility as described in its license.

Q. Is CR3 subject to these licensing requirements?

A. Yes, CR3 is licensed and regulated by NRC. PEF's CR3 operating license was issued by the NRC on December 3, 1976.

Q. Please briefly explain the nature of PEF's requirements pursuant to its operating license.

A. There are strict regulations that control the manner in which we maintain, modify, test and operate the nuclear plant. Incorporated into our license are commitments to industry standards and specific federal regulations. In addition to the CFR regulations, the NRC imposes requirements on operating plants as needed through a variety of mechanisms (Bulletins, Generic Letters, and NUREGS). Other operational conditions can be imposed on operators such as those that occurred after the Three Mile Island event, and more recently, the security upgrades that were required following the terrorist activities of 9/11. Many of these requirements are detailed within our Technical Specifications regarding the areas of safety limits, limiting conditions for operation, surveillance requirements, design features, and administrative controls. A part of our licensing basis is the Updated Final Safety Analysis Report (UFSAR) which provides detailed information about the plant design, environment, staffing, surrounding community, and proximate land use, in addition to other details. The original version of the document was the Final Safety

Analysis Report, FSAR, which was used extensively by the NRC to justify granting our existing license. This document is required to be maintained as various changes to the facility are implemented.

The license basis of the plant covers virtually all aspects of what my staff does on a daily basis. To ensure that the safety systems are working correctly, the technical specifications include hundreds of various surveillance tests that PEF must perform, at various frequencies, at CR3. Many of my employees' normal work day involves the performance of these surveillances. The training of my employees, the educational and experience levels they have, the calibration of instruments, the monitoring of plant equipment, the material used in specific components, the quality standards used in their manufacture, the tests used to validate their construction, the procedures used to repair and operate that equipment and many other things are detailed in CR3's license basis.

Q. Can you provide some examples of these regulations and specifications?

A. Yes. As required in the regulatory response to Three Mile Island, one NUREG requires nuclear unit licensees to "ensure that control room operators will be adequately protected against the effects of accidental release of toxic and radioactive gases and that the nuclear power plant can be safely operated or shut down under design basis accident conditions." In other words, to safely operate CR3, there must be no hazardous conditions that will cause the evacuation of the operators in the control unit. CR3 must have operators in its control room or special remote operating locations in the plant at all times.

To comply with this requirement, PEF must, for example, ensure that the CR3 control room has an adequate emergency zone with critical files and a washroom, self-contained breathing apparatus, and is sufficiently shielded from radiation and toxic gases infiltrating into the room. Under this regulation, fires are considered to be a hazard from which the operators must be protected. It is important to note that my operators cannot simply shutdown the unit during a fire and evacuate the plant. They must remain on station or retire to a remote operating station in a separate fire zone. Should a large fire emerge in the vicinity of the plant, the ventilation system for the control building must protect them from the fumes for the expected duration of the fire.

Another important area of regulation is the availability of offsite power to the nuclear unit. The offsite power system of a nuclear power plant provides the preferred source of electrical power to all the station auxiliaries. Loss of the offsite source results in a plant upset condition and the start of the backup power sources. Power can be lost by things like smoke and dust interfering with the transmission lines or the switchyard. If offsite power is lost, there is a large amount of equipment which must function to mitigate such an event. The NRC imposes requirements as to that back-up equipment, to ensure that the nuclear unit can be safely operated even when its offsite power source is interrupted. There are also several requirements designed to prevent the loss of the offsite power, including maintenance of the power lines and other offsite equipment.

The NRC also regulates each nuclear unit's safety or protection systems. Section 50.55a, "Codes and Standards" of 10 C.F.R. Part 50 requires that protection

systems at nuclear units must meet the standards set forth either in IEEE Std. 279-1971, "Criteria for Protection Systems for Nuclear Power Generating Stations," or IEEE Std. 603-1991, "Criteria for Safety Systems for Nuclear Power Generating Stations." Both standards basically define a safety or protection system as a system that is designed to detect conditions at the plant that could cause safety issues or concerns with the operation of the plant.

These standards also require that the safety or protection system must perform even in the presence of a single failure within the system. In other words, the safety or protection system must operate even if any one part of it has failed. In addition certain features must be designed so that no single failure could cause inadvertent operation of the safety system. To comply with this requirement, plants employ a redundant safety system, where two trains of the same safety system operate simultaneously to ensure that at least one will function at all times.

To maintain the integrity of these systems, plants must prevent common mode failures from occurring. A "common mode failure" is a condition or hazard that affects both trains of systems such that neither of the systems functions to notify the plant of a safety issue. For example, if the two trains of a safety system are located in the same room, the plant must take care to ensure that that room will not be flooded, because this would subject both trains to the same environmental threat. Problems with the operation of one component are reviewed to ensure that similar components on the other train do not present the same problem. Excessive dust must be evaluated against this criteria.

Q. Are there any other ways that the NRC communicates with PEF, as an operator of CR3?

A. Yes, the NRC regularly issues Information Notices to all holders of operating licenses for nuclear power reactors. These notices alert the operators of recent events at other nuclear plants that have resulted in various issues with plant safety or operation. Although the notices are not legal requirements, the holders of the operating licenses are expected to review the information in the notices and determine whether the lessons in the notices apply to their own plants.

Q. Can you provide examples of these information notices?

A. Yes, on October 20, 1985, the NRC issued Information Notice 93-85 to provide details concerning safety related relays that failed to operate properly due to dirt intrusion into electrical contacts. In another Information Notice, IN – 2002-34, dated November 25, 2002, the NRC noted where the accumulation of dirt and dust within the grease of safety related breaker auxiliary contacts lead to the failure of emergency diesel output breakers at another nuclear plant. In Information Notice 98-64 the NRC noted examples of electrical bus bar failures, including those in which dirt had contributed to the failure of safety related electrical components leading to bus bar explosions.

Q. How would you characterize the operating requirements imposed by the NRC on PEF's operation of CR3?

A. The NRC's regulation of all nuclear units, including CR3, is very extensive. NRC's main focus is on operating safety of the nuclear units. The NRC consistently works to evaluate all nuclear units to anticipate most problems that could arise and then find a way to limit the risks of those problems. As time passes, and incidents occur at nuclear facilities, the NRC notifies all operators of nuclear units to evaluate whether that particular incident could be prevented at other facilities. I literally have a library room full of binders and bound copies of the various regulations, interpretations of regulations, and industry standards with which I am committed to comply. My licensing supervisor has estimated there are over 600,000 pages of regulatory guidance which apply to the operation and maintenance of the station. Each engineer is required to demonstrate a basic understanding of the regulatory structure before they are allowed to work without direct supervision. I have a group of six licensing engineers whose only function is to review and prepare regulatory correspondence and support NRC inspection functions.

III. SPECIFIC CONCERNS WITH HANDLING AND BURNING PRB COAL AT CRYSTAL RIVER

Q. Are you generally aware of the characteristics of handling and burning PRB coal?

A. Yes, I have been informed that the chemical composition of the PRB coal that OPC proposes PEF should have been burning in its CR4 and CR5 units, unlike the bituminous coal currently used in those units, can cause the PRB coal to

spontaneously combust. There is also increased dustiness with PRB coal, and that dust can catch on fire as well. The volatility of the PRB coal is explained in more detail in the testimony of Rod Hatt.

Spontaneous Combustibility

Q. Taking first the spontaneous combustion characteristic, what concerns, if any, do you have regarding handling and storing PRB coal on the same site as the CR3 nuclear unit?

A. I am very concerned about the risk that piles of PRB coal could go up in flames so close to CR3. The PRB coal would be stored and transported quite close to CR3, at times coming as close as 620 feet. Clearly, the storage of PRB coal significantly increases the chances of coal fires in the vicinity of the nuclear plant. My concerns in addressing that increased plant risk are primarily in three areas. The first area is in the ability to protect the nuclear operators who cannot evacuate during a large fire. The second concern is what effect a coal fire might have on the equipment required to operate the plant safely. Lastly, I am concerned by the possibility that this flammable and potentially explosive coal pile might provide an opportunity to an adversary terrorist group which would challenge our nuclear security.

With regard to the ability to protect the operators, this represents an unanalyzed challenge to the control room ventilation system. That system is placed in recirculation, passing the air through charcoal filtration trains in the unlikely event of a release of significant amounts of radiation. The ventilation system must also

ensure that the control room staff is protected from potential airborne hazards, such as toxic smoke from burning coal.

With regard to the performance of plant equipment, there are numerous concerns. There is operating experience from another facility, where a local grass fire lead to the loss of off site power due to the smoke affecting the plant switchyard. The effect on the switchyard can be especially great when fighting the fire. There have been many examples where fires in the area surrounding nuclear plants have caused a loss of off site power to the facilities. The conveyor belts that will transport PRB coal to CR4 and CR5 are also quite close to the power lines that supply CR3 with its offsite power. Bringing large quantities of PRB coal onto the site would threaten to interrupt CR3's offsite power in the event of a fire in the arriving barge or on the coal pile to the south of the switchyard, or while being conveyed to the north plant as it passes underneath the transmission line.

To make matters worse, the plant depends on emergency diesel generators in the event of a loss of off site power. Significant amounts of smoke coming from a coal pile fire would represent a challenge to the operation of those diesels. They are located on the south east side of the reactor building, only a few hundred yards from where the coal would be stored. Should significant amounts of smoke envelope the diesel building, I would be unable to ensure that the diesels would operate at capacity. Their operating margin is relatively small and any reduction in their ability to produce sufficient power in the event of a loss of offsite power would represent a significant challenge to any review by the Company.

Lastly, the plant staff is required to maintain a nuclear security force which must be capable of protecting the station from a terrorist threat, as outlined in the NRC's Design Basis Threat (DBT). While the details of the DBT are not public, in general, it outlines threats and adversary characteristics that these facilities must defend against with high assurance. The type of coal currently used at CR4 and CR5 does not present any specific threat to nuclear security. It would be fairly difficult to start a large fire using this bituminous coal and such a fire would be quickly extinguished. My understanding of PRB coal is that it not only spontaneously combusts but under certain circumstances it can become explosive. Given the possibility that PRB coal is explosive, I believe we would need to also evaluate the potential that this material could be used by an adversary force to create a diversion that permits security to be compromised. In addition, CR3 is protected by armed sharpshooters in guard houses. If a PRB coal fire occurred, it would cause toxic, black smoke that could impair the guard's ability to see enemy persons on the site.

Increased PRB Coal Dust

Q. Please explain the effects that increased coal dust would have on the prevention of common mode failure.

A. Industry experience demonstrates that electrical components do not perform well with significant amounts of dirt and dust. From breakers to relays, there are numerous examples where keeping electrical components clean is important to ensuring their reliability. The NRC has issued the results of a large review on the common causes of electrical breaker failures in the industry. This was published as NUREG/CR 6819

Vol. 4. Within that document, the accumulation of dirt and dust within breaker components was cited as one of the most significant contributors to breaker failure.

With the introduction of large amounts of powdered coal dust, maintenance costs associated with keeping the nuclear unit clean will increase. As part of the design of nuclear plants certain safety features must utilize redundant trains to ensure the failure of one train does not prevent the successful mitigation of a plant event. In this case, however, all trains of every safety system would be subject to the same challenge. That challenge would be the introduction of large amounts of fine coal dust in the air surrounding the components. This represents a potential common mode failure for a wide array of electrical components. In other words, the potential for a common mode failure would have to be evaluated to determine the effect on the safety system trains. Dust problems like this have been the subject of several information notices, as explained above on page 14.

Another potential risk posed by the increased PRB dust is that it is flammable. The PRB dust could settle in the cable trays at CR3, which may increase the risk of a fire in those cable trays. Cable trays hold the power cables and logic circuitry for safety and non-safety components necessary for plant operation. A cable tray fire is extremely dangerous to the safe operation of the plant. A fire in the cable tray could cause extensive damage to the plant.

Q. Have any other nuclear plants violated NRC regulations for allowing a common mode failure?

A. Yes, in one example, at the Fermi 2 nuclear plant operated by Detroit Edison, the utility failed to recognize the potential for ice to cause a common mode failure of critical cooling water pumps. The utility was found to be in violation of NRC regulations. There are other examples of such common mode failures resulting in NRC violations.

Steps to Evaluate Bringing PRB Coal to Crystal River on Long-Term Basis

Q. What steps would PEF have to take to analyze this proposed change, to bring significant amounts of PRB coal onto the Crystal River site on a long-term basis?

A. A summary of the steps taken by a nuclear plant licensee prior to making a change at the plant can be found in Exhibit No. __ (JF-8) to my testimony. Each of these steps is discussed in detail below.

Step 1: Does the proposed change require a 50.59 analysis?

Q. What is the first step in the analysis of the proposed change?

A. Any change to the nuclear plant has to be fully evaluated for its potential impact on safety. As part of that review, The Company must consider whether bringing the PRB coal onsite for long-term use is something that needs to be analyzed pursuant to 10 C.F.R. 50.59. To decide this question, PEF must decide whether there is a chance that the proposed change will affect any of the safety systems at the plant, or will affect the likelihood or frequency of an accident occurring at the plant. Given the

type of hazards presented by PRB coal, the spontaneous combustibility and the increased dustiness, it is my opinion that a 50.59 analysis would be required.

Step 2: If a 50.59 analysis is necessary, what does such an evaluation involve?

Q. Please explain the next step in the process.

A. The second step required to analyze a change, if the first step shows that it is necessary, is the 50.59 evaluation. Such an evaluation would be difficult and time consuming. The possible effects of the PRB coal on plant conditions would have to be evaluated and a determination made if this change represented a condition which would represent an "un-reviewed safety question." In other words, the Company must determine whether the 10 C.F.R. 50.59 test would be met or not. If it was not met, meaning that the proposed use of PRB coal represented more than a minimal increase in risk, then submittal to the NRC would be required. There are at least three areas I believe would have to be analyzed: 1) a potential increase in the likelihood of a loss of offsite power in combination with a potential degradation of the emergency diesels; 2) an additional hazard to control room habitability; and 3) the potential for a common mode failure to critical electrical components.

Q. Taking each of these concerns in turn, please explain the risks that fire and smoke would have to CR3's offsite power.

A. As explained above, the CR3 nuclear unit is supplied with offsite power by various transmission lines that connect to the CR3 switchyard. It is important to mention that the reliability of off-site power is one of the most important factors to nuclear safety.

The first risk is that all four of these lines cross over the conveyor belts that would transport the PRB coal to the north coal yard. In addition, one of the 230 kV lines comes within about a 100 feet of the north coal yard itself, where OPC alleges that PEF should blend the PRB coal. If a coal fire were to break out in these locations, the resultant fire and smoke could affect the lines and interfere with the supply of power to the CR3 unit.

Perhaps the most significant threat to offsite power would be a coal fire that would carry smoke and soot into the switchyard. Industry experience shows that even small fires represent challenges to switchyard components. There are physical connections in the switchyard which act as large scale switches carrying the 230 KV and 500 KV loads. Soot and smoke could cause arc events in a switchyard which could in turn cause the switches to open in a faulted condition. This would result in a loss of offsite power. A similar situation occurred at the Diablo Canyon nuclear power plant when a grass fire erupted near the unit. The dust from that fire caused a loss in offsite power to the plant. The Institute of Nuclear Power Operations, INPO, reported in October of 1982 that there had been six documented forest fires in the preceding 10 years that had resulted in a loss of off site power to the industry. Since that time plants have taken the precaution of preventing and eliminating fire hazards in the vicinity of their offsite power supplies. Undergrowth is controlled near lines and transmission corridors are maintained to significantly reduce the chances of a fire. Bringing PRB coal onto the site would increase the risk of fire and be a hindrance to these efforts to reduce the risk of forest fires interfering with the offsite power supply.

In addition, discussed above, this hazard might also challenge the on site emergency diesels. This fact makes this change significantly more complex and risky.

Q. How serious is a loss of offsite power to a nuclear facility?

A. Losing offsite power is probably one of the worst occurrences that could happen at the unit. If CR3 lost its offsite power, it would have to shut down for several days. The NRC would likely investigate the incident as well. To illustrate, if such an event is caused by unforeseen events like a hurricane, wind storm or wild fire, the response by the NRC would be mild. If it was determined that the fire was caused by actions taken by the Company which created the fire hazard, an NRC special inspection team could be assigned.

Q. Regarding the next concern, control room habitability, please explain the risks posed by the characteristics of the PRB coal.

A. As I stated previously, the control room staff must remain at the plant under all conditions. This requires a control room envelope which protects them from all potential hazards. For example, there are plants which have large chlorine tank cars stored in the vicinity of the control room ventilation. Their control room ventilation systems are designed to detect and automatically protect the control room staff from the hazard of a tank car failure, which causes a large cloud of chlorine gas. This is done even though these events are very rare. In this case, the likelihood of a coal fire during the life of the plant would be fairly high if PRB coal was used. As such, the

engineering staff would have to demonstrate that the toxic smoke from that fire would not represent a significant challenge to the operators. This might be something that can be evaluated, or it might require significant modifications to the systems utilized, similar to those plants with chlorine tank cars.

Q. As for the final area of concern, common mode failure, how would this risk be analyzed under 50.59?

A. As explained above, the increased dustiness of the PRB coal may affect the electrical components in the nuclear plant. This dust increases the risk that safety systems in the unit could experience a common mode failure. The 50.59 analysis would include an evaluation of various ways to control or prevent the dust, such as dust suppression at the coal yard and filters within the nuclear plant. The evaluation would also include an assessment of the amount of risk that a common mode failure of the safety systems would occur, even with the mitigating strategies to control the dust.

Q. Have you created a preliminary list of issues that would need to be analyzed and resolved pursuant to 10 C.F.R. 50.59?

A. Yes, I have created a preliminary list, which is reflected in the attached Exhibit No. __ (JF-9). This list is an initial assessment of the required analysis. The list may change, however, once the actual evaluations began.

Step 3: Does the change pass the 50.59 analysis?

Q. What is the next step in the overall analysis?

A. PEF must evaluate the results of the 50.59 analysis and determine whether the tests outlined in 10 C.F.R. 50.59 were met or passed. In other words, the Company would have to determine whether there was no more than a minimal increase in risk posed by the PRB coal.

Q. What would happen if the Company determined that it passed the 50.59 evaluation?

A. The Company would not have to submit a formal application for a license amendment to the NRC. It could bring PRB coal on the site, provided that it made the changes needed for the mitigating strategies that were evaluated (like dust suppression and fire protection). I should note, however, that PEF would be taking the regulatory risk that the NRC could come back and challenge the Company's assessment of the PRB coal hazards.

Step 4: Submittal of License Amendment Application to the NRC

Q. What is the final step in the analysis of the proposed change?

A. The Company would need to submit a license amendment application if the result of the 50.59 evaluation indicated that the proposed change would result in more than a minimal increase in risk. In other words, if PEF did not "pass" the 50.59 test, a license modification would be required.

Q. Would PEF be required to submit a license modification request that analyzed the additional risks posed by the PRB coal?

A. It would take a significant engineering effort to know the answer to that question and fully understand what the potential effects of the PRB coal dust and fire hazard on the electrical components. It could take six months to a year and might require special testing of components. This is not a condition that is well understood by the nuclear industry and we would therefore be treading new ground.

Q. Does the fact that, as Mr. Hatt testifies, there are certain actions that can be taken to control the risk of fire and suppress the dust, affect your assessment whether a license modification would be needed?

A. Again, I cannot say at this point whether these mitigation strategies will be adequate for PEF to avoid having to submit a license amendment application to the NRC. What I can say is that the mitigating actions referred to in Mr. Hatt's testimony would have to be thoroughly evaluated by the Company to determine whether an increased amount of risk is posed by the change. When it comes to nuclear power, you do not roll the dice and take unnecessary risks without completely and fully evaluating those risks, including mitigating strategies to control those risks.

Q. What would PEF have to do if it decided it needed to apply for a license modification after the 50.59 evaluation?

A. As I have described, the Company must evaluate the additional risks that the hazards of spontaneous combustion and increased dustiness would pose to the nuclear unit. To do this, it must conduct an engineering evaluation of the systems that could be affected by the new risks. This is a long process and it involves analysis from several

different angles. For each identifiable effect on the plant, as explained above, the Company must provide detailed analysis regarding the solution it suggests to eliminate or mitigate the problem. In order to evaluate these risks, the Company might have to extensively test and conduct studies to assure that a significant reduction in the identified risk could be achieved by the proposed mitigation measure. Since there is significant experience with PRB coal available in the fossil generation industry, the Company would evaluate that experience to see if an increase in risk is still present with the proposed mitigation strategies.

For example, consider the risk that a coal fire on a barge or in the temporary coal staging area could introduce a common mode failure for the emergency diesel generators. Such a fire could envelope the diesel building for some period of time. This is not a simple grass fire, like in the example from the other facility I mentioned earlier, but a significant cloud of soot and hazardous gasses. PEF would have to demonstrate that the diesel generators would be capable of supplying the required electrical loads with this cloud serving as the air supply for the diesels. That would most likely require a demonstration test using a diesel of similar construction and a simulated cloud of smoke. Special filters might have to be installed to address both the smoke challenge to the diesels and the effects of the continuous coal dust. An alternative to this might include compensatory measures. We might have to install additional fire suppression systems near the coal storage and handling locations. We might then also have to permanently staff an independent fire brigade for the coal yard which would have significant regulatory requirements for their training,

equipment testing, readiness to respond and ability to quickly extinguish the largest reasonably possible fire.

After this special engineering evaluation and modeling, if the change failed the 50.59 test and represented a previously un-reviewed safety question, the Company would submit a license amendment application to the NRC for review. PEF's application would have to include a detailed strategy for mitigating the additional risks posed by the PRB coal. The preparation for a license amendment request of this magnitude would very likely be lengthy considering the number of effects on the plant that would have to be evaluated.

Q. Can you give an example of how such a review can lead to plant modifications, at CR3?

A. Yes, a few years ago during a design review of the generator diesels, plant personnel recognized that exhaust was coming from the muffler of the emergency diesel generator and re-circulating into the generator. This re-circulation only occurred when the wind blew in a particular direction, but the effect was that it increased both the temperature in the room and the combustion gas mixes. This posed a risk to the ability of the generator to maintain rating. Given this situation, PEF undertook a series of tests and analyses to determine whether the exhaust situation could be resolved. The complete analysis took months to complete. A proposed modification to the building structure was designed to separate the diesel intake and exhaust. In order to evaluate the design, the Company built an exact model of the unit, along with an artificial wind tunnel. In the end, the Company was required to build an

approximately 10 foot wall in front of the diesels to protect them from the wind. The cost of this capital modification was approximately $1.7 million.

Q. Once the application has been submitted, what happens next?

A. The NRC then reviews the application and considers whether the capital modification that PEF has suggested will adequately ensure the safe operation of the plant. Again, given the number of different things to be analyzed, and because PRB coal presents a new type of hazard to the nuclear industry, this would not be a simple evaluation.

Q. What standard does the NRC apply when considering a license modification such as this?

A. The NRC is, first and foremost, concerned with the safety of the nuclear unit. Before a license modification request will be approved, the licensee requesting the amendment must show that the requested change will not create any undue risk to the plant's safety.

Q. If PEF could demonstrate that the PRB coal would represent a significant savings in coal expenditures, would that impact NRC's decision to issue a license modification?

A. The price of coal is secondary to safety. The NRC is concerned with maintaining and ensuring the safety of the nuclear unit. To prevent accidents at CR3, the NRC strictly enforces its safety regulations. The focus is on safety.

Q. Are there any other nuclear plants in the country that are located on the same site as a fossil-fuel unit that is burning PRB, sub-bituminous coal?

A. No, there are no other nuclear units located near a coal unit that burns sub-bituminous or PRB coal. In fact, CR3 is one of the few nuclear units located near a coal unit burning bituminous coal.

Q. What effect, if any, will the fact that no other nuclear plant is located on the same site as a PRB-burning coal plant have on NRC's review of an application to amend PEF's license to permit long-term use of PRB coal at CR4 and CR5?

A. First, this lack of prior nuclear experience with the risks presented by PRB coal will increase the difficulty and length of PEF's evaluation of the change. In addition, the NRC is likely to review the application even more carefully than it would any other, more routine requests. Without any precedent of another nuclear unit being so close to the handling and burning of PRB coal, the NRC may take an even longer amount of time to evaluate the Company's proposed mitigating strategies and the risk.

Q. Does the NRC have any special reaction to the risk of fire?

A. Yes, the NRC is very sensitive to fires near and within nuclear plants. There are several regulations, most notably Appendix R to Part 50 of the CFR, which are meant to prevent and mitigate fires. Appendix R and other NRC regulations and guidance constitute a lengthy set of compliance-based requirements that provides details with regard to everything from plant design, cable routing, pre-fire planning, fire mitigation strategies and fire fighting capabilities. In addition, as part of the licensing

condition of all plants, including CR3, there must not be a reduction in the effectiveness of the plant's ability to prevent and mitigate fires.

Q. To speed up the process, could PEF go ahead and make the capital modifications suggested in its license modification application, should one be required?

A. No, until the NRC gives its final approval of the license modification, the Company, being prudent, would not make any capital modifications. This is because it is quite possible that the NRC will not approve the application as written and will require additional or different types of capital upgrades.

Q. Is it possible that, even with the detailed analysis and evaluation, the PRB coal could be determined to be unsafe?

A. Yes, because the complete analysis has not been done, it is not clear that the Company could convince itself or the NRC that bringing a significant amount of PRB coal onto the Crystal River site on a long-term basis would be safe. Given the characteristics of the PRB coal, even mitigating strategies may not provide adequate assurance that no undue risk will be created.

Q. Even if the NRC would approve the use of PRB at the Crystal River site, would you feel comfortable with the coal being near the CR3 nuclear unit?

A. Absolutely not. As the plant manager, I am most concerned with safety. Given the risks posed by the volatile PRB coal, I do not want large quantities of it in the vicinity of the CR3 nuclear plant. After what I have heard about this coal I would not propose

we go through the process of evaluating the effect of the coal on the design and license basis of the plant.

IV. EFFECTS ON CR3 DURING 2006 TEST BURN

Q. Were you working at CR3 during the time May 20-23, 2006, when PEF did a test burn of a blend of PRB coal?

A. Yes, I was at the plant during that time period.

Q. What, if anything, did you notice during this test burn period?

A. I and other employees at CR3 noticed a significant increase in the amount of dust at CR3. On Saturday, May 20, when the barge of the PRB coal blend was offloaded, there was a significant and noticeable increase in the amount of coal dust on the floor of the plant. The increased dust was so noticeable that, even after sweeping the floor in the morning, by the afternoon the floor once again had swirling piles of coal dust.

Q. Isn't there always some amount of coal dust present at CR3 on a normal basis?

A. Yes, but the amount of dust in the plant that day was significantly more than what is usually found at CR3, when bituminous coal is burned and handled at Crystal River.

Q. During that time period, was there a particular day on which the dust was heaviest?

A. The increased dust was definitely more noticeable when the barge was being offloaded, on May 20, 2006. But the CR3 plant experienced more dust than normally experienced during the entire trial burn, even after the barge was unloaded.

Q. Does the increased level of dust at CR3 give you any concern?

A. The amount of dust experienced during this relatively brief trial burn, especially while offloading the barge, gives me a great amount of concern. As explained above, the presence of dust may give rise to a common mode failure of one of CR3's safety systems, and this failure may result in violations of NRC regulations.

Q. Do you have an understanding as to the amount of PRB coal that was used during the trial burn in May 2006?

A. I understand that an 18% PRB coal, 82% bituminous coal blend was used to conduct the test burn. I further understand that the coal was blended off-site, offloaded from the barge, and sent straight to the CR5 unit.

Q. Are you aware that OPC's expert, Mr. Sansom, alleges that PEF should bring in 100% PRB coal by barge to Crystal River, and blend it on-site with bituminous coal before burning it at CR4 and 5?

A. Yes, I am aware that Mr. Sansom advocates bringing in pure PRB coal by barge into Crystal River.

Q. Based on what happened at CR3 during the test burn of an 18% PRB blend, do you have any additional concerns with PEF offloading and handling pure 100% PRB coal?

A. Yes, with CR3 being so close to the barge offloader, I am very concerned with the level of dust that a barge of 100% PRB coal will cause in the CR3 nuclear plant. The amount of dust caused by just an 18% blend of PRB coal was alarming enough; the prospect of Crystal River taking in routine barges of 100% pure PRB coal is a major concern. Likewise, the increased dust from the handling and blending of 100% PRB coal is of great concern to PEF's ability to maintain CR3's safety systems.

Q. Do the dust suppression and dust collection mechanisms, as described by Mr. Hatt in his testimony, address those concerns?

A. Not completely. As Mr. Hatt explains, even with the dust suppression and dust collection mechanisms, it is very unlikely that all the dust can be eliminated. In fact, these dust suppression and collection systems are least likely to be effective during offloading. The most dramatic increase of dust was observed during offloading. At a minimum, the dust suppression and dust collection mitigating strategies must be subjected to the rigorous evaluation I explained earlier in my testimony, to ensure that they would effectively limit the risk to an acceptable level.

Q. Please explain why it was not necessary for the Company, from a nuclear standpoint, to evaluate the decision to bring PRB coal onto the site for the short-term test burn.

A. The trial test burn was for a limited period of time, such that the PRB coal was only on the site for a matter of days. The total amount of PRB coal was relatively small. It was also never stored long-term at the site, because it went straight from the barge to the coal unit. In addition, the blend of PRB/bituminous coal that was brought onsite was so low (only 18% PRB) that the effect on the nuclear plant was not substantial enough to require an analysis. However, the decision, to bring in 100% PRB coal for long-term use, storage, on-site blending, and handling, would have to be evaluated as explained above.

V. FUTURE TEST BURNS

Q. Are you aware that there may be future, longer-term test burns of PRB or sub-bituminous coal, at Crystal River?

A. Yes, I am aware that such trial burns are being considered.

Q. What, if anything, do you plan to do about these plans?

A. Prior to any significant amounts of PRB coal being off loaded at the site, PEF must evaluate the effect of that coal on the nuclear plant and if required, submit to the NRC to seek an operating license modification for CR3. And, as explained above, the review of this type of change is quite lengthy and there is no guaranty that it can be performed without prior approval of the NRC.

Q. Why didn't PEF perform such an analysis years ago when Units 4 and 5 first were put into service?

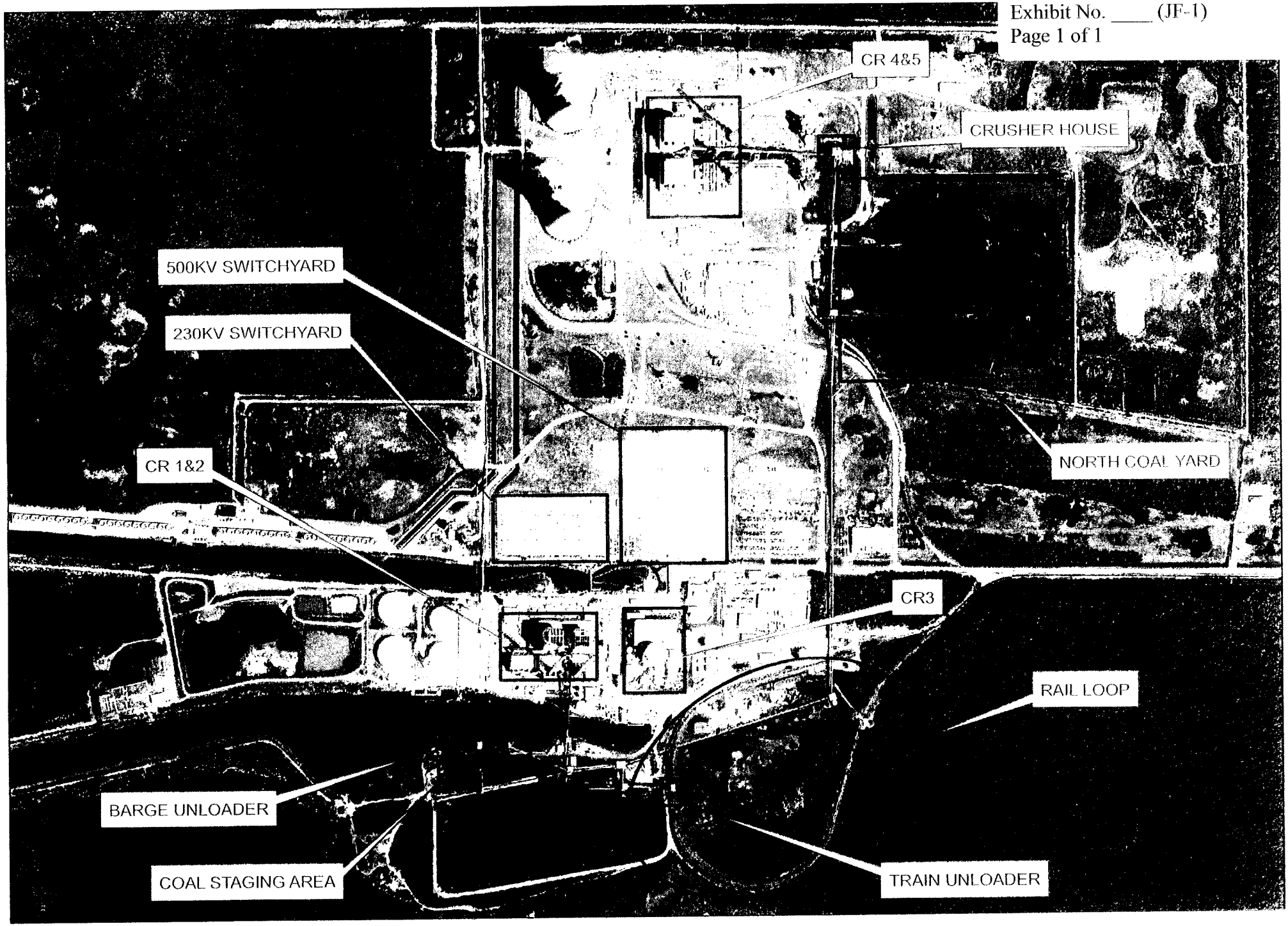
A. First, the risks associated with PRB coal and fires and flammable PRB coal dust were not fully known or appreciated by the industry in the late 1970s, when Units 4 and 5 were sited. So even if the analysis had been performed then, such an analysis would have been incomplete. In addition, Units 4 and 5 never actually burned PRB coal and in fact the Company entered into two long-term contracts for bituminous coal. The NRC evaluation process is so extensive and rigorous, no utility would undertake it unless it was sure that it would ultimately use the PRB coal. In other words, it is not reasonable to do the evaluation, and seek the license modification if necessary, as a "placeholder" on the chance that the coal may be used at the units.

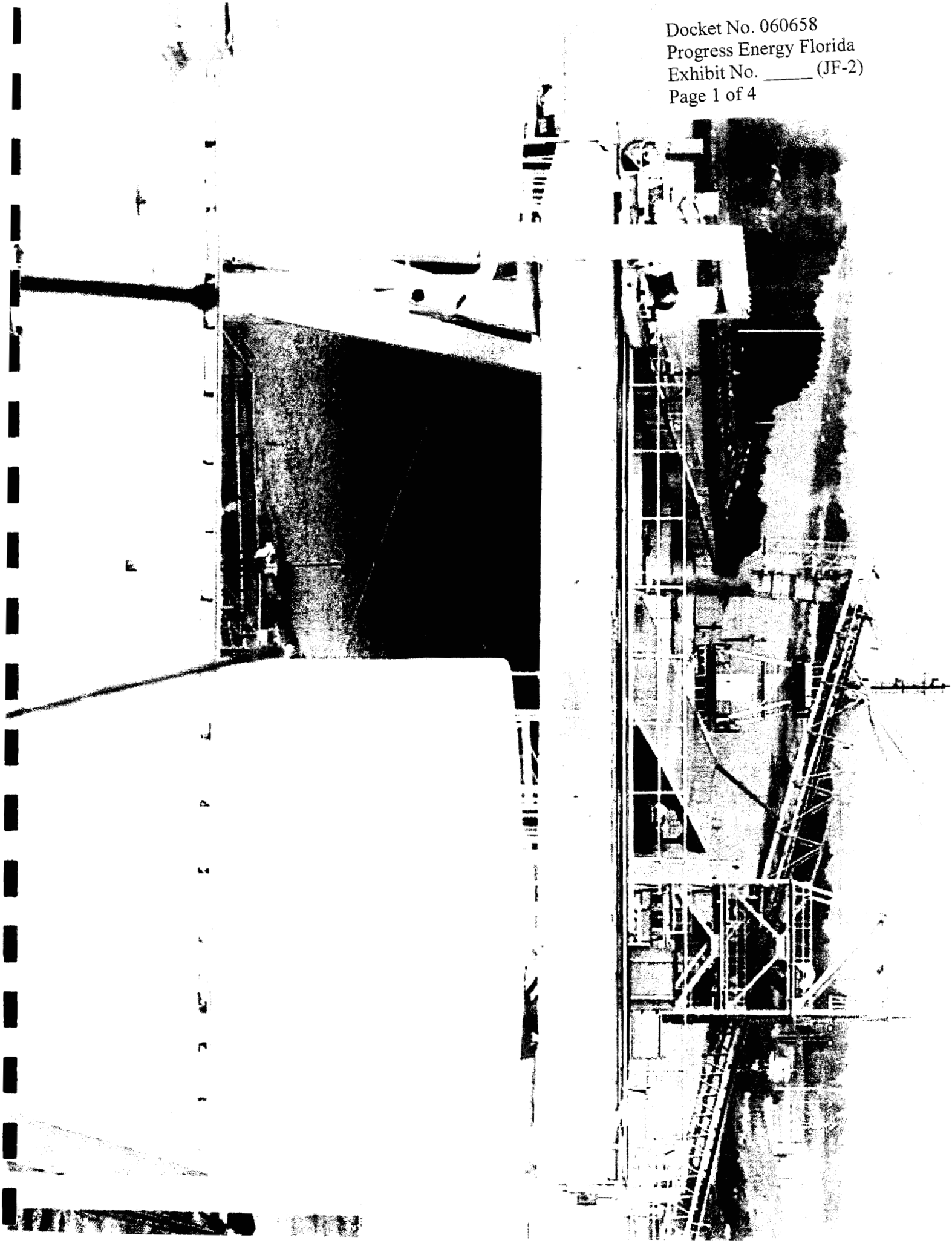
VI. CONCLUSION

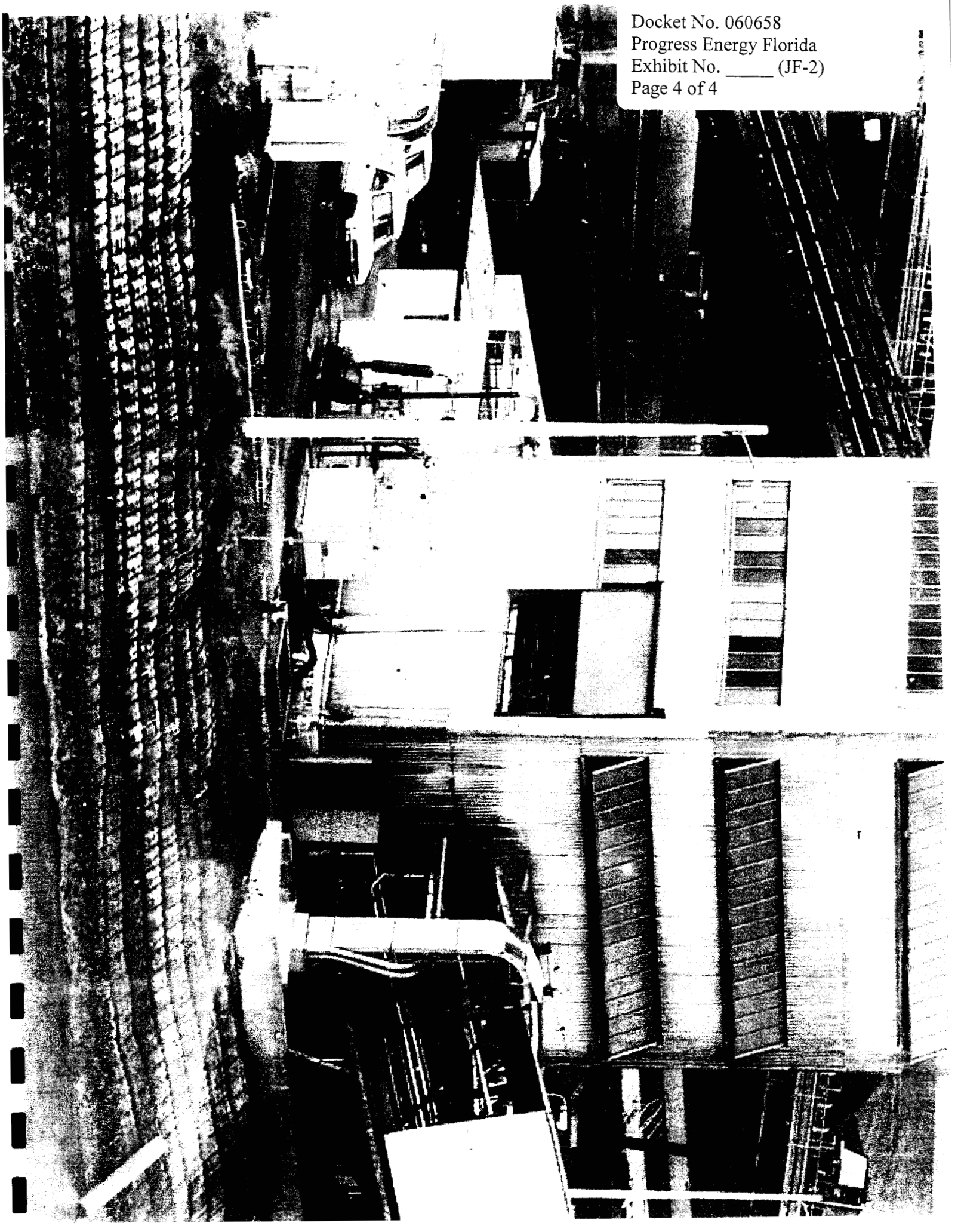
Q. Does this conclude your testimony?

A. Yes, it does.

CRYSTAL RIVER ENERGY COMPLEX







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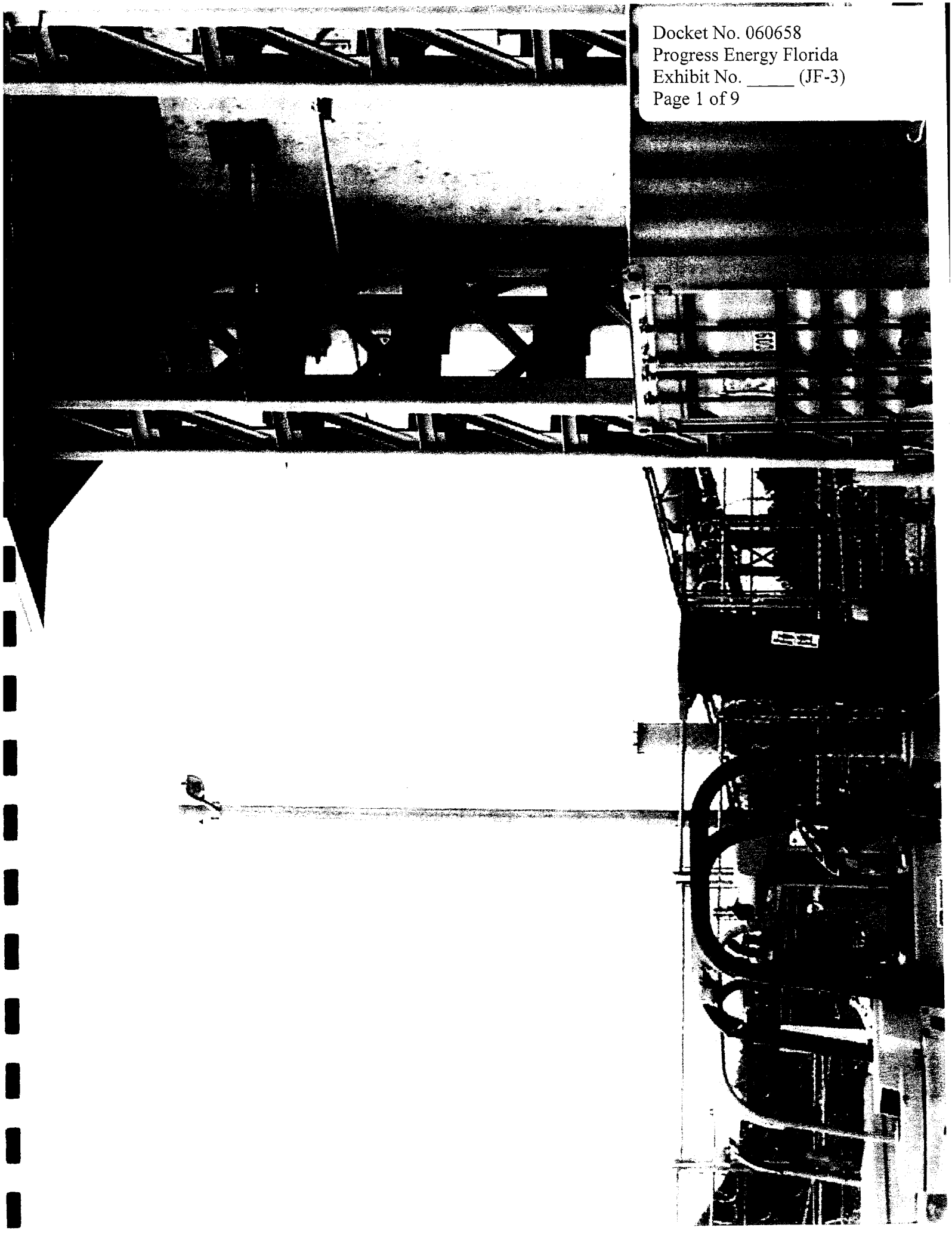

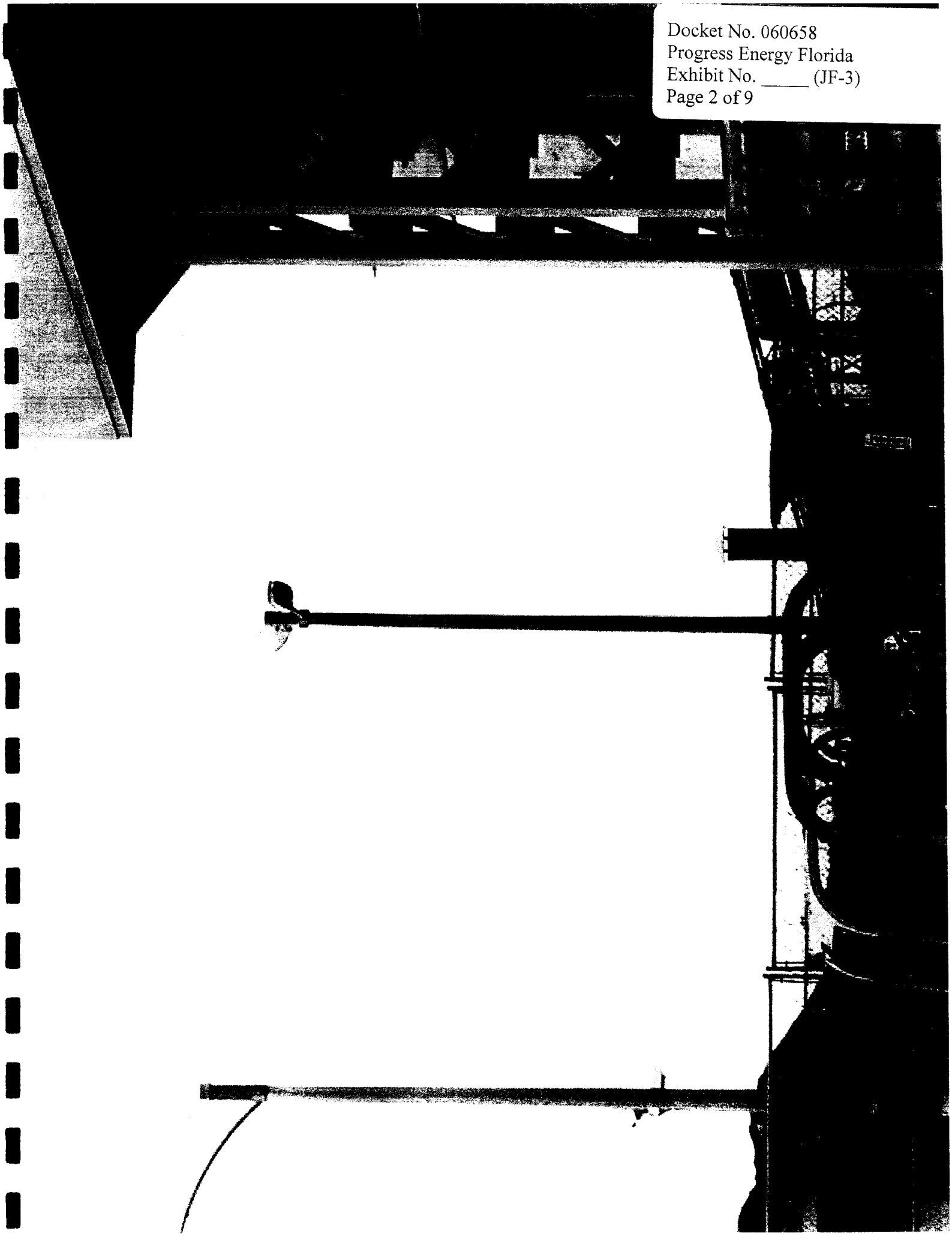

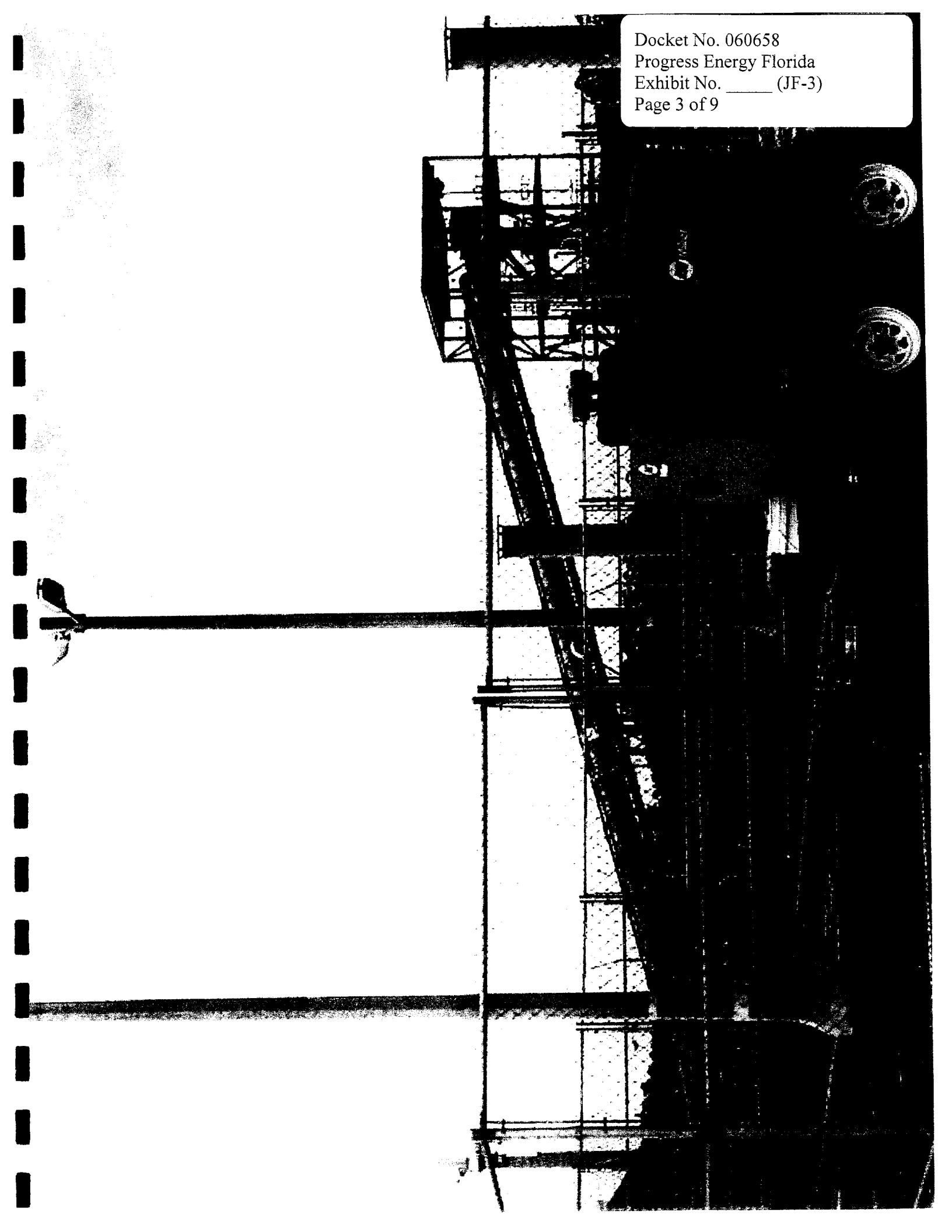

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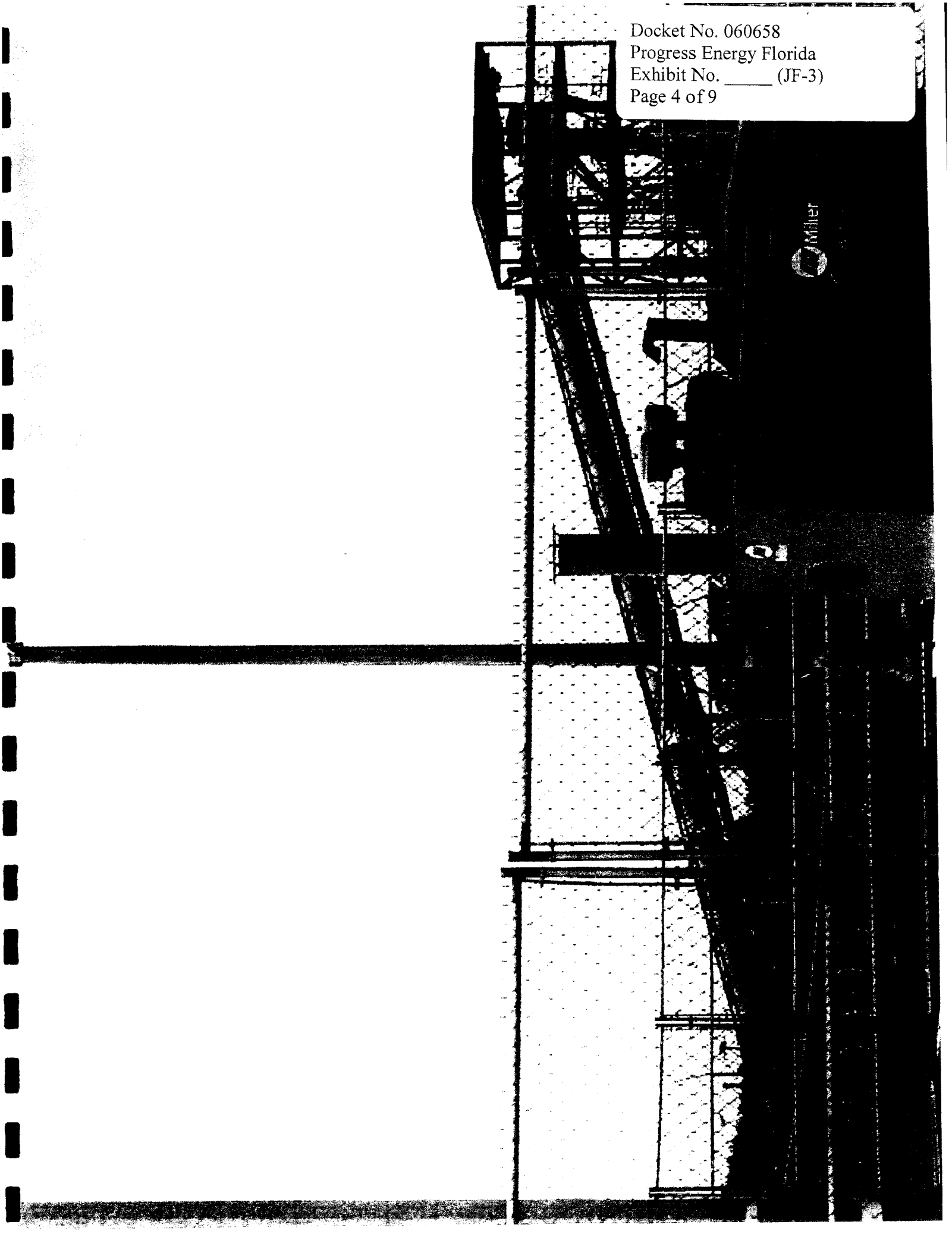

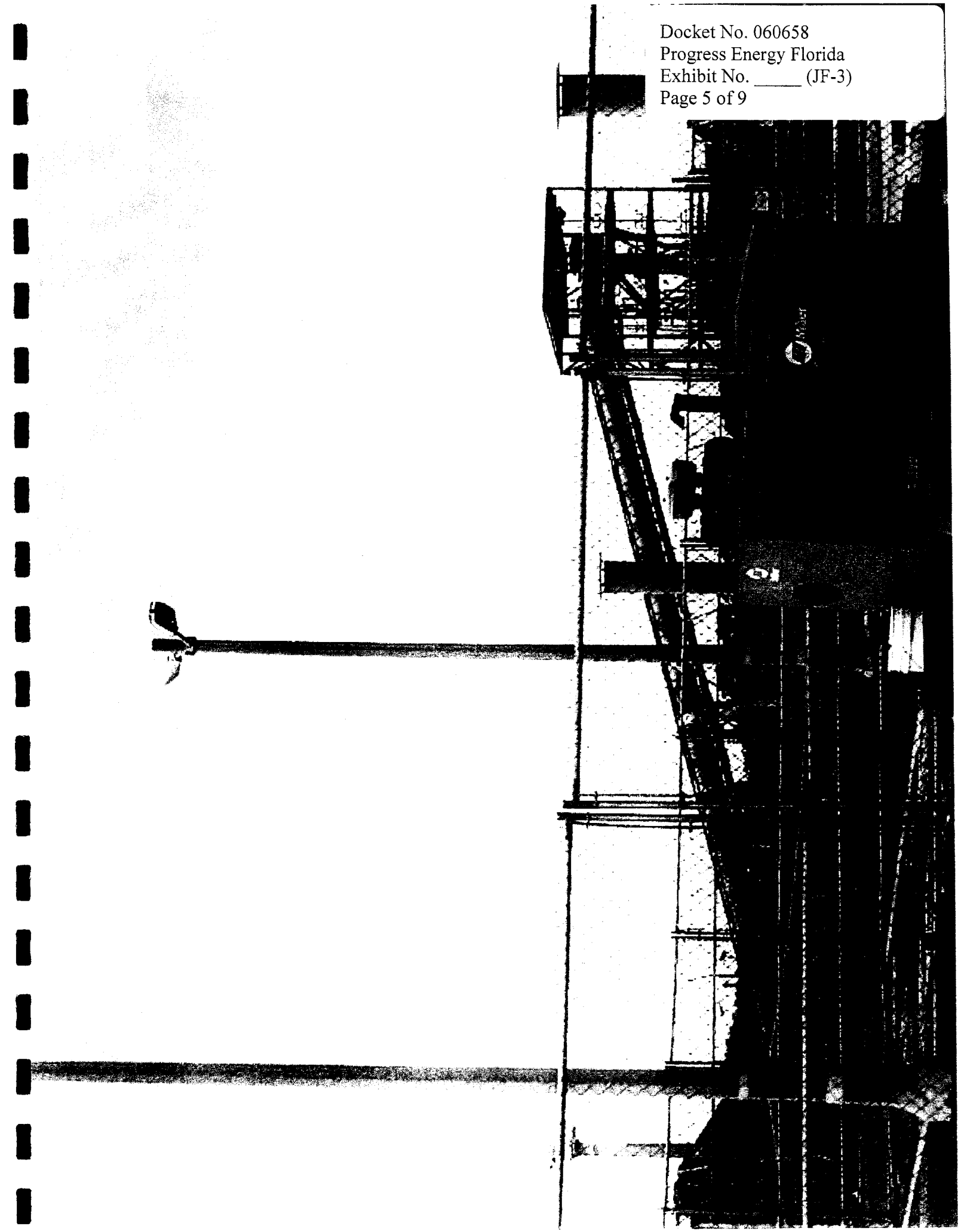

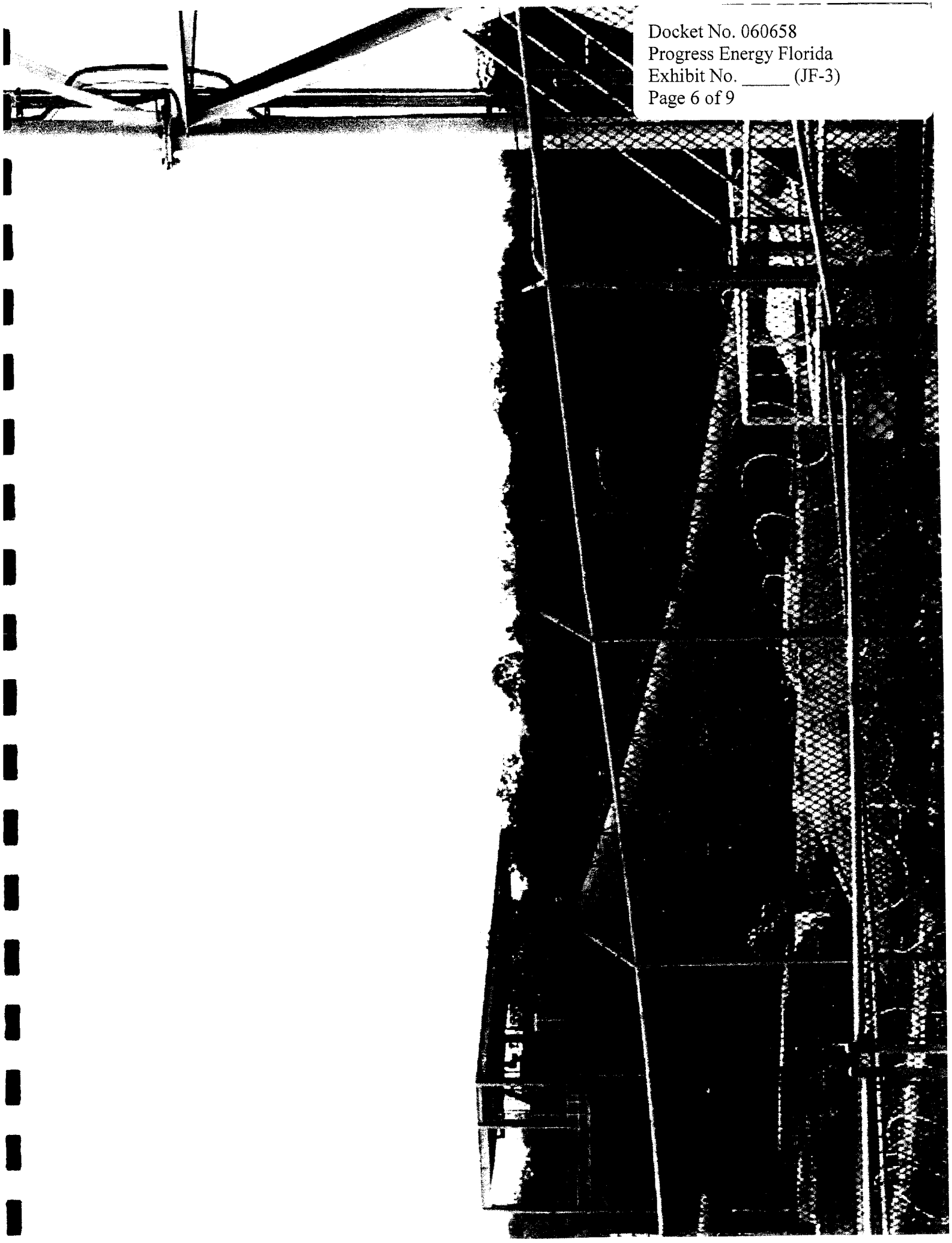

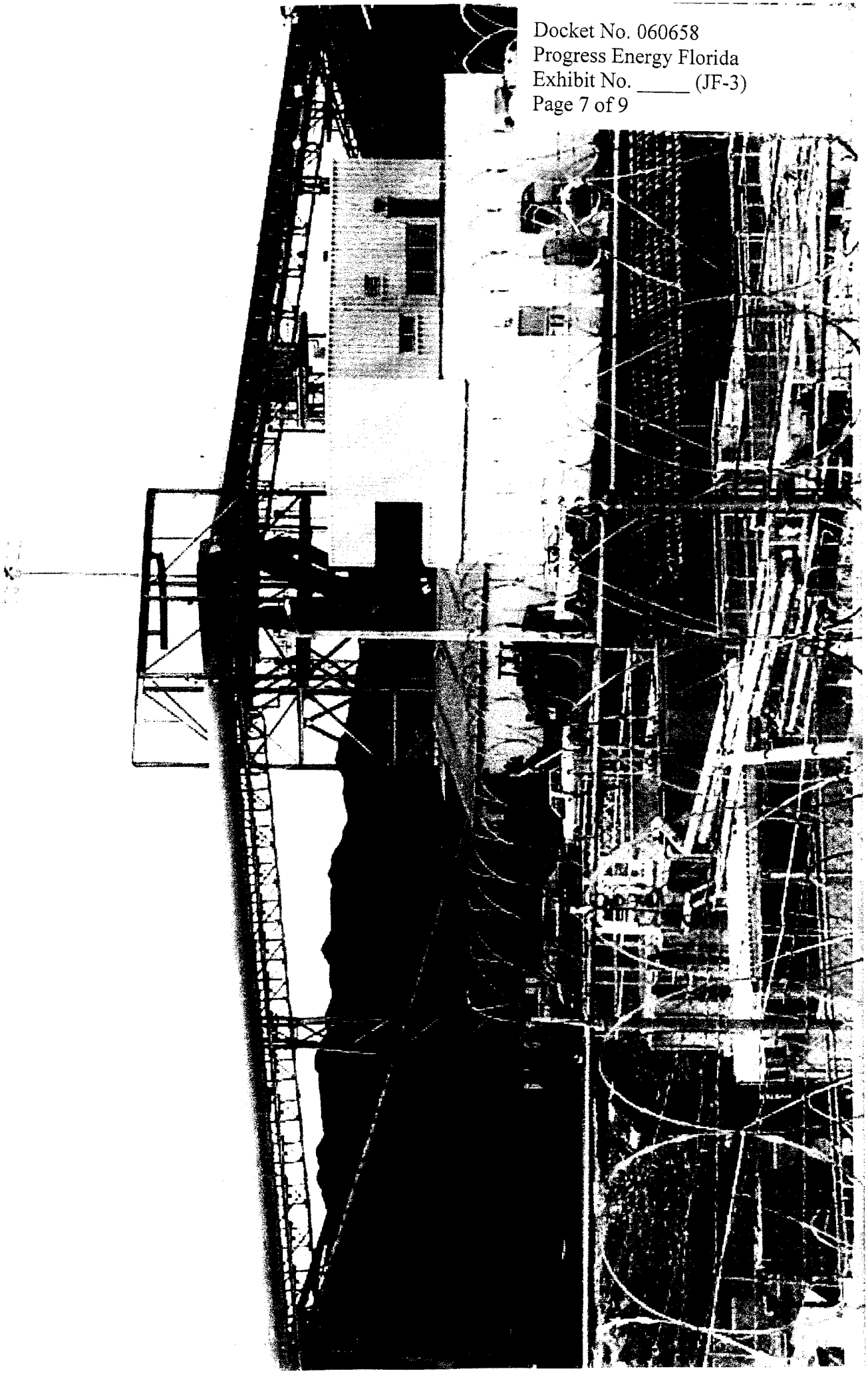

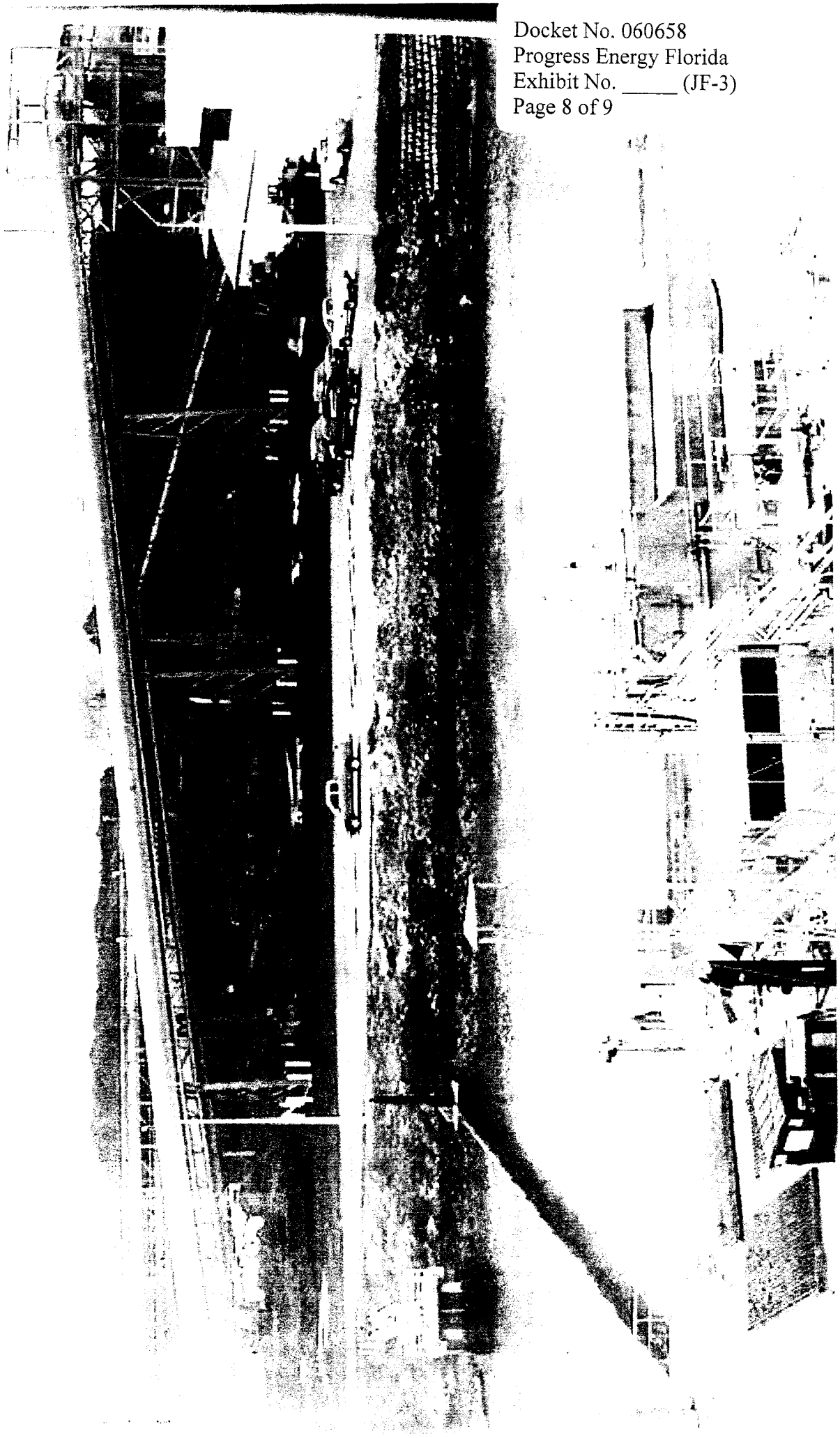

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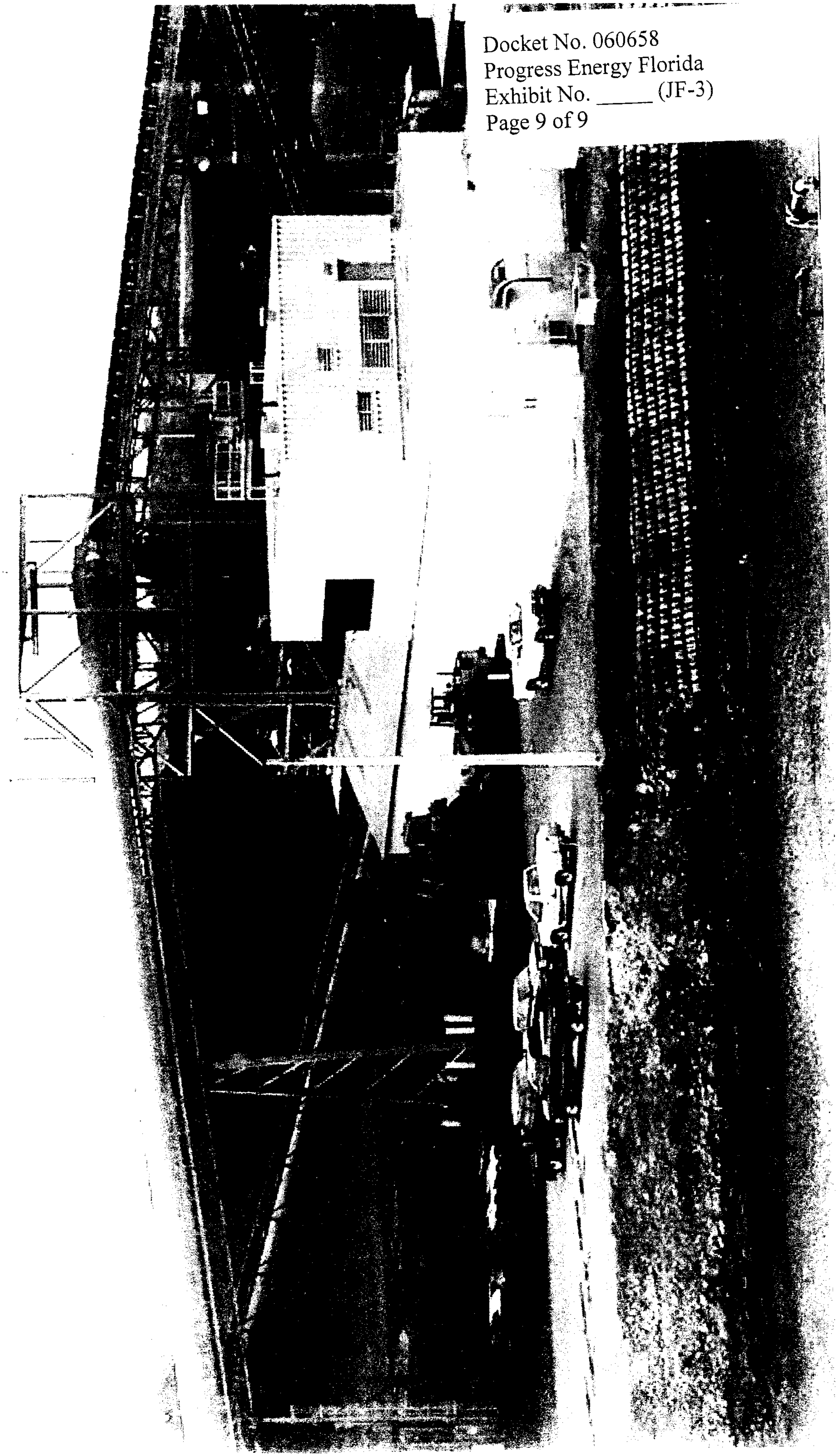

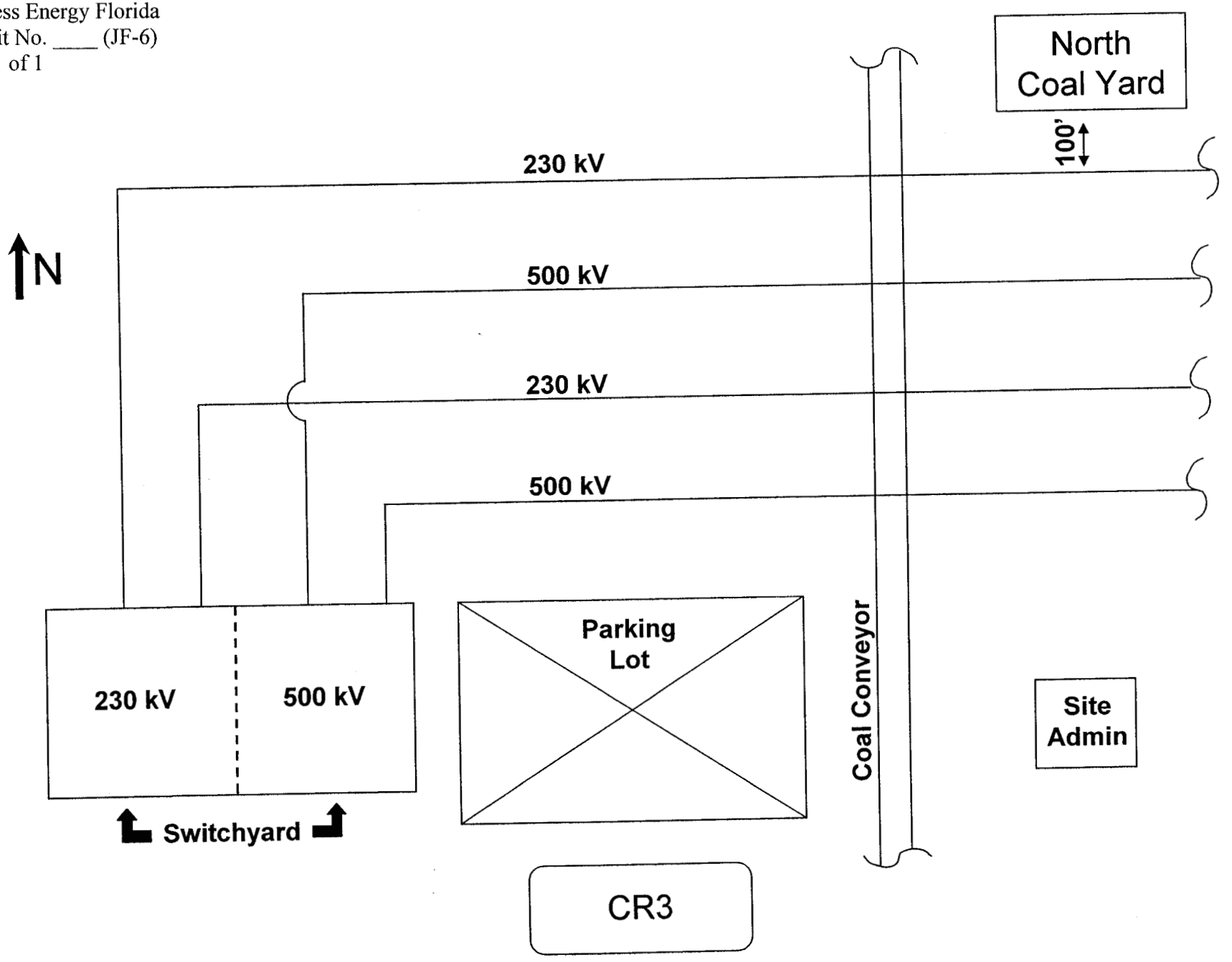
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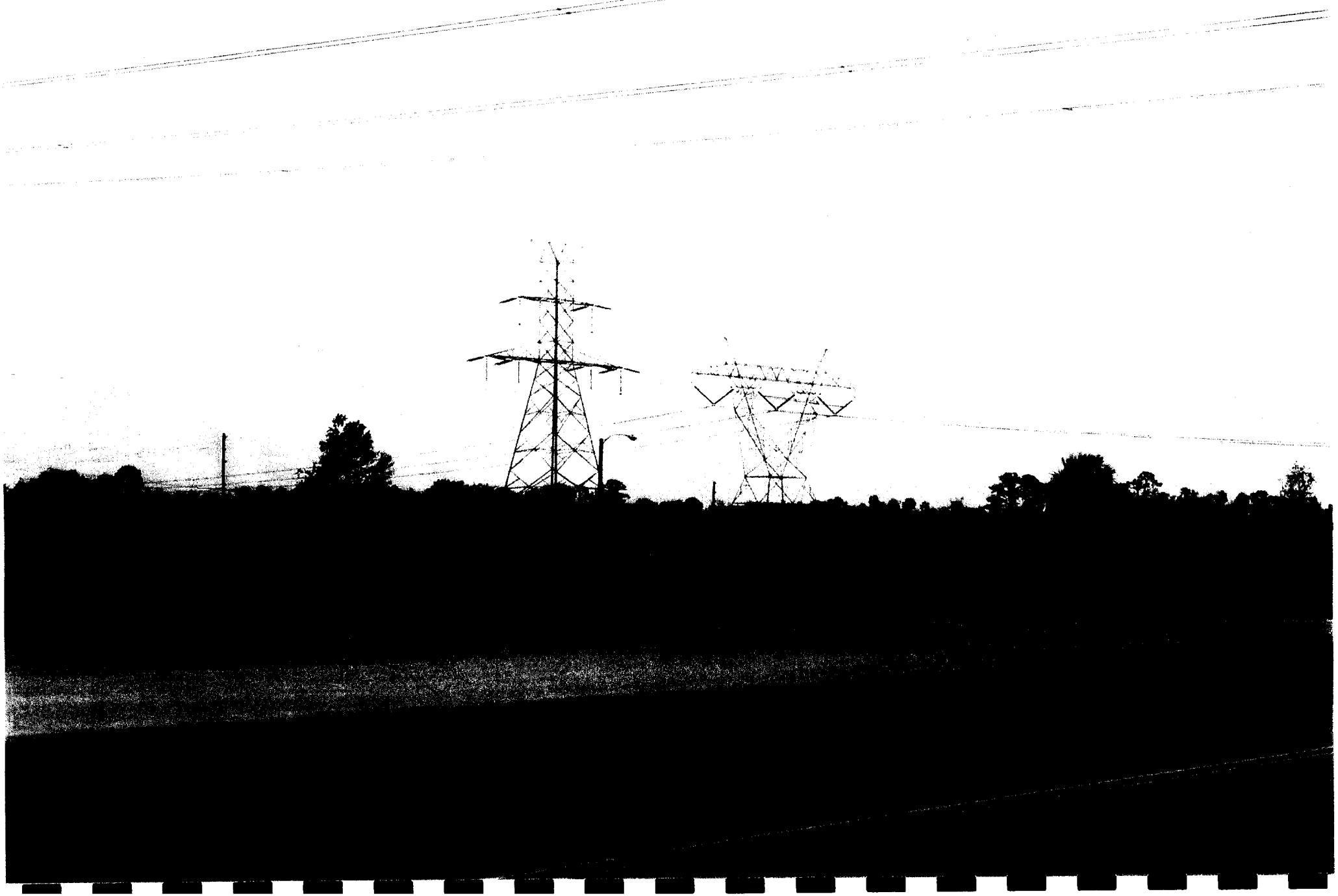
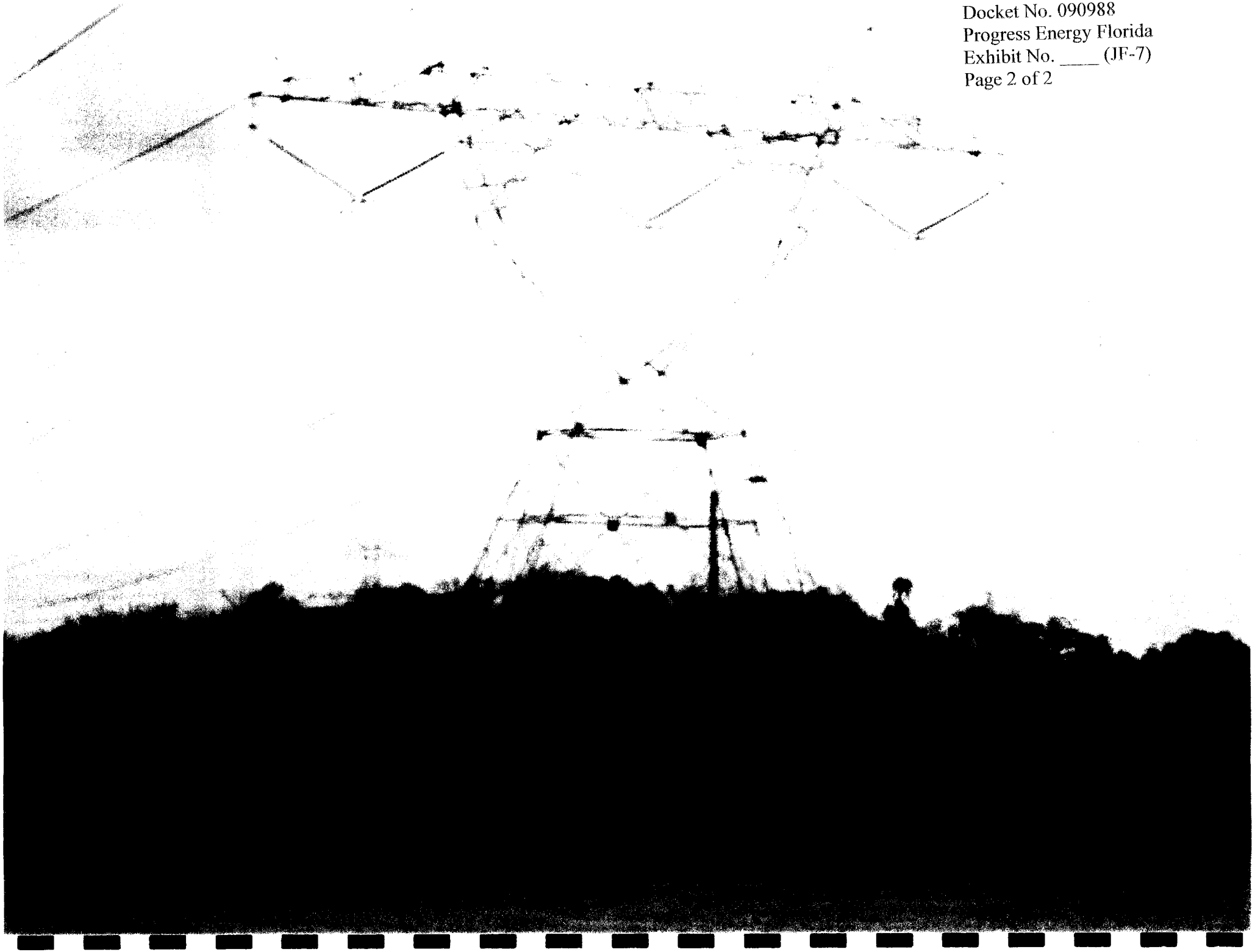
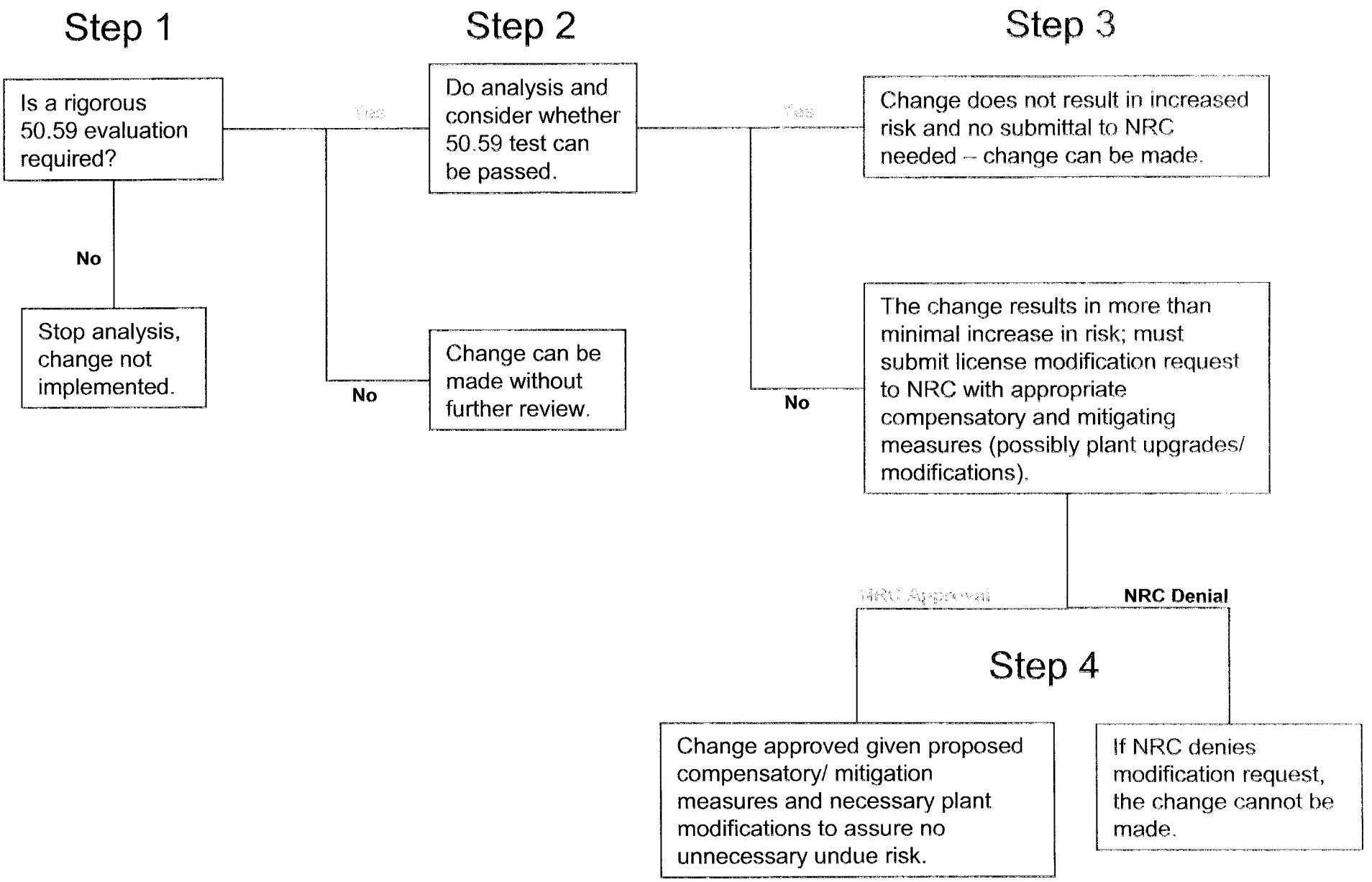
Coal Yard
100'
230 kV
500 kV
230 kV
500 kV
N
230 kV
500 kV
Switchyard
Parking
Lot
Coal Conveyor
Site
Admin
CR3





Analysis of Steps Taken to Evaluate Proposed Change at Nuclear Facility



Potential Affects to Electrical Equipment at CR-3 from use of Powder River Basin Coal

Problem	Dust	Fire/ Smoke
Control Room Emergency Ventilation System --- Ability to detect and isolate for Control Room Habitability. Noxious gas monitors may need to be added. Leakage values may have to be improved, depending on any hazardous gasses present.	X	X
Potential Risk to Off-Site Power Reliability Dust and smoke from coal fires would increase the likelihood of a loss of off site power. Potential fire beneath off site power transmission lines. Increased maintenance to prevent or mitigate the effects of a fire.	X	X
Potential Common Mode Failure risk to instrumentation and breakers Dust intrusion would challenge safety system electrical equipment.	X	X
Potential impacts on Nuclear Safety Would the pile be a target set for terrorists. Ability to detect and engage adversary forces through smoke of a large fire set by the adversaries.		X
MET Tower instrumentation degradation due to dust Back up MET Tower located near U1 / U2 Coal Yard.	X	
Reliability of safety and non-safety motors Dust sticking to windings and fans in electric motors - This is a long term issue	X	

Problem	Dust	Fire/ Smoke
Motors out on the waterfront would be especially susceptible.		
Radiation Monitors in the Turbine Bldg.		
Potential effect on monitors requiring change in equipment.	X	
Ventilation Filters for various buildings may not filter smaller particulate.	X	
Any open fuel and lube oil systems will have increased dirt in them which may result in unplanned impact on plant safety system operability	X	
Vented tanks (ie: fire service) will have increased dirt in the system which may result in unplanned impact on plant safety system operability	X	
Emergency Vehicle Access		X
Conveyor belt fire could restrict access to the nuclear plant by blocking the only road into the site, which may impair the ability of emergency vehicles to enter the site		