

NERC

NORTH AMERICAN ELECTRIC
RELIABILITY CORPORATION

Reliability Readiness Evaluation Report Balancing Authority/Transmission Operator

Lakeland Electric
Lakeland, Florida

to ensure
the reliability of the
bulk power system

December 3–6, 2007

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Introduction and Evaluation Process

The North American Electric Reliability Corporation (NERC) Reliability Readiness Evaluation and Improvement Program is one of the commitments of NERC and the industry to strengthen the reliability of the North American bulk power system. The program conducts independent evaluations of balancing authorities, transmission operators, reliability coordinators, and other key entities that support the reliable operation of the bulk power system to assess their preparedness to meet their assigned reliability responsibilities. The evaluations identify strengths and areas for improvement in an effort to promote excellence in operations among these organizations.

Since its inception in 2004, NERC and the industry have been working collaboratively to enhance the program. The evaluation process is based on fundamental aspects of reliability: culture, operations, maintenance, planning, and training. The document [NERC Readiness Evaluation Procedure](#) describes and defines the process used for reliability readiness evaluations. This document and other documents related to the program are available at <http://www.nerc.com/~rap/>.

The reliability readiness evaluation teams, each led by a NERC staff member and a regional co-leader, include industry volunteers with considerable expertise selected to provide representation from other interconnections, other regions, and neighboring operating entities. The teams also typically include representatives from the Federal Energy Regulatory Commission (FERC) staff.

The public version of the reliability readiness evaluation report contains the majority of the evaluation team's findings. Any discussion of findings pertaining to critical infrastructure will be contained in Appendix 1, a confidential appendix to the report that is sent privately to the evaluated entity and is not included in the public version of the report.

An evaluation team met on-site with Lakeland Electric representatives on December 3–6, 2007. This report reflects the views and recommendations of the evaluation team regarding the readiness of Lakeland Electric to meet its responsibilities as a transmission operator.

Evaluation Team

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**Observer

Organization Profile

Lakeland Electric is a municipal electric department of the City of Lakeland, Florida. The electric department is governed by the City Commission of Lakeland. The service area extends beyond the city limits and covers approximately 256 square miles within Polk County. Lakeland Electric is a member of the Florida Municipal Power Pool (FMPP). FMPP member Orlando Utilities Commission is responsible for balancing and purchasing-selling entity functions for the FMPP members.

Lakeland Electric is a transmission owner/operator and controls the distribution system. The system includes 27 miles of 230 kV and 121 miles of 69 kV transmission lines. The distribution system operates at 12.47 kV throughout the service area.

Lakeland Electric has a total of eight interconnections with Progress Energy — Florida, Tampa Electric Company, and Orlando Utilities Commission at both 230 and 69 kV. An independent power producer is also connected to the Lakeland Electric system.

FRCC is the Regional Entity for peninsular Florida, including Lakeland Electric and FMPP, and serves as the reliability coordinator for Lakeland Electric. Lakeland Electric is registered with NERC as a distribution provider, generation owner, generation operator, load-serving entity, planning authority, resource planner, transmission owner, transmission operator, transmission planner, and transmission service provider.

Lakeland Electric's all-time winter peak is 745 MW, reached on January 24, 2003. The all-time summer peak of 700 MW occurred August 9, 2007.

Executive Summary

An evaluation team reviewed facilities, processes, plans, procedures, tools, and personnel to evaluate Lakeland Electric's readiness to perform the transmission operator functions necessary to maintain the reliable operation of the bulk power system.

The team cites a number of positive observations related to Lakeland Electric personnel. Lakeland Electric operations personnel have good communications among themselves, with upper management, and especially with system planners. The hiring of new operators for training prior to any vacancies shows a commitment to a quality succession plan. The promotion of two system operators to lead system operator positions earlier this year provides additional supervision and allows one of the lead system operators to act, for the most part, as a dedicated trainer. All of the system operators have attended train-the-trainer classes to assist on-the-job training of new hires.

A positive aspect of the infrastructure relates to communications. All of Lakeland Electric's substations and power stations are connected by fiber-optic rings to provide redundant and diverse data and voice communications with the control center.

The team offers a number of recommendations, including two key recommendations, each with two parts. The security system for the headquarters building needs attention, and some vulnerability exists regarding the EMS and communications equipment. The backup control center EMS equipment is dependent upon the primary facility. Just the opposite is true for the telephone equipment; the primary facility's telephone equipment is dependent upon the backup facility. These key recommendations are discussed further in Appendix 1.

Overall, the evaluation team identified 13 positive observations and offers 14 recommendations that, if implemented, will enhance Lakeland Electric's readiness to operate reliably and maintain the reliability of the bulk power system. The recommendations are listed in order of importance.

Positive Observations

The evaluation team noted the following positive observations during the reliability readiness evaluation process:

1. Lakeland Electric utilizes multiple fiber-optic rings for redundant and diverse communications to all substations and power stations. See further discussion in Appendix 1.
2. Lakeland Electric has proactively hired two trainees, anticipating the retirement of two electric system operators (Section 5.1).
3. Lakeland Electric exceeds the minimum required training hours for certified electric system operators (Section 5.1).
4. All operating positions are staffed with NERC-certified operators (Section 5.1).
 - a. A minimum of two operators are on every shift.
 - b. The distribution system operator position is staffed by NERC-certified operators.
5. The electric system operators work both the transmission desk and distribution desk, rotating between them frequently (Section 5.1).
6. All electric system operators attend a formal train-the-trainer class (Section 5.1).
7. All electric system operators participate in training new hires (Section 5.1).
8. Lakeland Electric's control center supervisor maintains NERC certification (Section 5.1).
9. There is a high level of communications between system operators and support staff for both communications systems and the EMS (Section 1.1).
10. There is a high level of communications among the electric system operators (Section 1.1).
11. Senior management has a high level of respect for operations personnel (Section 1.1).
12. One lead electric system operator is designated as the trainer and spends the vast majority of his time on training activities (Section 5.1).
13. Lakeland Electric has a strong succession planning and recruitment program (Section 1.1).

Recommendations

The evaluation team offers the following recommendations:

1. Confidential information on physical security redacted from the public report. See discussion in Appendix 1.*
2. Confidential information on plans for loss of control facilities redacted from the public report. See discussion in Appendix 1.*
3. Develop a formal process for implementing and communicating policy and procedure changes to the operating staff to ensure operators have read and understand changes (Section 2.1).
4. Develop a formal process for implementing and communicating planning study results to the operating staff to ensure receipt and understanding of the results (Section 4).
5. Produce a single display to include static, dynamic, and total reactive reserve capability to make it easier for operators to quickly evaluate available reserves (Section 2.1).

6. Review and update the Lakeland Electric voltage schedules and provide to the Lakeland Electric generating stations (Section 2.1).
7. Minimize the overlap between the underfrequency load shedding and the manual load shedding programs (Section 2.4).
8. Create a set of guidelines for the system operator to follow for determining whether an outage request should be forwarded to the planning engineers or acted upon without further analysis (Section 4).
9. Formalize the approval process for new operators to work independently by requiring a signature from each person involved in the decision to ensure consensus (Section 5.1).
10. Implement a simulator into the training curriculum to provide opportunities for the electric system operators to practice event-response techniques (Section 5.1).
11. Confidential information on computer systems and support is redacted from the public report. See discussion in Appendix 1.
12. Extend the documentation template used for system operations procedures to other documents used by electric system operators (Section 2.2.3).
13. Include the required NERC certification level in the job descriptions for electric system operator and lead electric system operator to ensure the minimum level of certification is maintained (Section 1.2.1).
14. Expand the control center mission statement to include adherence to NERC standards (Section 1.2.1).

*Jointly identified by the company and lead evaluator as a key recommendation

Discussion

The reliability readiness evaluation team examined the following key areas during the evaluation. The detailed discussion that follows provides the foundation for the recommendations and positive observations the team identified. The report uses the generic term “system operator” to refer to all on-shift operating personnel responsible for executing the functions necessary to operate reliably and maintain the reliable operation of the bulk power system. This term will be used for the discussions unless additional specificity is required, such as *balancing* system operator or *transmission* system operator.

1. Culture

1.1 General

The corporate organization provides the necessary leadership and management for system operations to sustain high levels of safe, reliable operation.

Lakeland Electric’s upper management has great respect for the system operators, which the team notes as a positive observation. Management only gets involved with the most important decisions in operations. The system operators are well trained and NERC-certified.

There is a high level of open communication between system operators and the support staff. They discuss communications and EMS concerns and changes, often making suggestions about improving the systems. The team cites this level of communication as a positive observation.

At weekly meetings and when on shift, system operators discuss concerns about operational policies and procedures and about operational issues. The evaluation team considers this a positive observation.

Lakeland Electric has established performance and operational goals at all levels. The electric system operators discuss goals and rewards with supervision frequently. A suggestion system provides an anonymous method of submitting ideas and provides monetary rewards for good suggestions.

Lakeland Electric has a strong succession plan. The plan provides for employee retention and helps the company to fill positions after promotions and retirements. The team considers the plan a positive observation. The trainees mentioned in the training section are a good example of the plan’s effectiveness. Lakeland Electric also has plans to replace key positions when vacancies occur. The team considers the succession plan to be a positive observation.

Performance reviews are conducted at least annually for operations personnel. A disciplinary policy is in place for poor performance or unacceptable behavior. Each employee is accountable for the actions and responsibilities identified in each job description.

1.2 Organizational Effectiveness

1.2.1 Foundation for System Reliability

The organization's values and behaviors—modeled by its leaders and practiced by its members—serve to make system reliability a top priority.

Lakeland Electric has a number of guiding statements and principles:

Vision:

Powering our community with excellence in energy solutions

Mission:

To enrich our community's quality of life with excellence in products and services through an engaged workforce

Values:

- **Accountability:** Take responsibility for our actions with an appropriate sense of urgency
- **Appreciation:** Recognize and celebrate our successes, learn from our mistakes and value the opinion of others
- **Customer Focus:** Create a desire for others to do business with us.
- **Diversity:** Recognize and utilize our differences
- **Initiative:** Encourage and value creativity, innovation and sensible business risk.
- **Integrity:** Be sincere and honest in what we do
- **Open Communications:** Speak from the heart and listen with respect
- **Safety:** Prevent injury to our fellow employees and the general public
- **Teamwork:** Work together to achieve more

Strategies:

- Attract, motivate, develop and retain talented employees
- Efficiently integrate technology into business operations
- Be a customer focused organization
- Anticipate future system requirements through proactive planning
- Manage assets and resources to optimize return
- Support the growth of core business and develop new market opportunities

Electric Control Center Mission Statement:

Lakeland's Electric Control Center mission is to provide safety, reliability and security to Lakeland Transmission System, FRCC Region and the Bulk Power System by promoting teamwork, accountability, motivation and a staff of highly trained operators.

The evaluation team recognizes that Lakeland Electric has good vision and mission statements and that the control center has a mission statement. The team recommends that Lakeland Electric include a statement of adherence to NERC standards in the electric control center mission statement.

In reviewing the job descriptions for the electric system operator and the lead electric system operator positions, the evaluation team discovered the level of NERC certification was not identified, only stating that these positions must be NERC-certified. The evaluation team recommends that the minimum level of certification be included in these job descriptions.

1.2.2 Leadership and Management

Managers, by leadership, commitment, and example, establish and reinforce high standards of performance and align the organization to achieve safe, reliable system operation.

Lakeland Electric personnel participate in many FRCC regional activities. System operators participate in training activities including the blackstart restoration drills. Planners participate in the regional planning working groups.

Lakeland Electric planners and system operators review human errors and produce lessons learned that are included in training activities and operations meeting discussions. There is no formal human error program, but the process appears to be working well.

1.2.3 Corporate Oversight and Monitoring

Line management is used to strengthen reliability and improve performance. System reliability is kept under constant scrutiny through techniques such as self-assessments, performance indicators, and periodic management meetings.

Lakeland Electric's upper management is acutely aware of daily activities. Visits to the control room are routine — even the assistant general manager occasionally stops by to observe activities. Management is careful not to interfere with normal operations and only gets involved when it is necessary.

There is no formal process for reviewing lessons learned. However, issues are discussed at weekly system operator meetings. These meetings are typically held each Wednesday when a greater number of system operators are present due to the work schedule rotation. In addition, system operators have quarterly meetings where all system operators are present. In these meetings, management introduces new policies and procedures. Discussion then revolves around upcoming outages or other events.

1.2.4 Human Resources

Personnel resource needs are anticipated and individuals are systematically recruited, developed, and assigned positions in the system operations organization.

Lakeland Electric management provides a strong retention and recruitment program. The recruitment program involves introducing high school students to electrical operations. The program includes recruitment of college students as well as promotion from within.

A succession plan is in place for key positions in operations. The plan identifies possible candidates for each key position should the current employee depart for any reason.

1.2.5 Corporate Communications

System operations communications inform and engage both corporate and system operations employees so they can contribute to the strategic priorities of the organization.

Lakeland Electric has corporate meetings to update employees on upcoming projects and provide status reports on current projects. Certain meetings include all departments for discussing major operational events or equipment failures.

A Web portal has been developed to share news with employees. The portal contains information on current Lakeland Electric activities, system statistics, and weather.

The corporate mission statement is posted around the headquarters building in prominent places.

2. Fundamentals of Operations

2.1 General

Operations personnel monitor and control the system in a manner that ensures safe, reliable operation.

FMPP is the balancing authority for Lakeland Electric, with the Orlando Utility Commission acting as the agent providing the balancing service. Orlando performs the balancing, generation control, and transaction scheduling for all the members of the FMPP.

Lakeland Electric has formal standards of conduct. Although it is not required, Lakeland Electric considers the FERC Standards of Conduct as a requirement of disbursing transmission configuration information.

The EMS provides the system operators a means of monitoring the system in real time. The displays have useful pan and zoom features. The system includes wide-area displays for voltage and frequency measurements.

The alarm system has eight categories of alarms. Alarms are color coded and audible tones can be assigned. These alarms are separated to provide the system operator with a fast evaluation of the state of the system. The alarm processor has a separate monitoring system that flashes a red strobe light in the control room should the alarm processor fail.

Six frequency points are monitored across the Lakeland Electric system. This is adequate to determine any system breakup or islanding. The balancing function is not performed by Lakeland Electric, and automatic generation control is not used; as a result, there is no requirement to provide a frequency measurement for frequency bias.

System operators monitor and control the status of transmission capacitors and load tap changers on transformers. A display of the static reactive reserve is available, but the dynamic reactive reserve must be calculated by the system operators. The evaluation team recommends that Lakeland Electric develop a display of real-time reactive reserve, including static, dynamic, and total reactive reserve capability.

Voltages are controlled by use of reactive devices and reactive output of power plants. The system operators contact the power plants to have the voltage adjusted. There are no formal instructions to the power plants to follow a predetermined voltage schedule. The evaluation teams recommend that Lakeland Electric review and update the voltage schedules and produce a procedure for the power plants to follow.

As a transmission operator, Lakeland Electric does not establish any contingency reserve requirements. It is a member of the Florida reserve sharing group. The contingency reserves are deployed by the balancing agent for the Florida Municipal Power Pool as a group.

Lakeland Electric e-mails policies and procedures to the system operators. These changes are also discussed at weekly meetings of the system operators present. The evaluation team recommends that a procedure be developed for notification and feedback that the system operators have read and understand the changes. E-mail can be configured to require a receipt, or voting buttons can be included with options for the system operators to indicate understanding.

2.2 Operational Focus

2.2.1 Operational Safety

System operation activities are conducted in a manner that maintains high levels of safety and reliability for all system conditions.

Lakeland Electric has no special protection systems that operate as safety devices. Balancing services are provided by Orlando Utilities Commission.

2.2.2 Operational Decision-Making

Operational decisions are reached using a systematic and thorough approach that supports safe, reliable, and efficient system operations.

Lakeland Electric system operators have full authority to take action up to and including interrupting firm load. No permission is required from supervision or management. The authorization letter is signed by the assistant general manager and posted at both the primary and backup facilities.

Management is involved in decisions affecting long-term reliability or major failures, such as generator failures or transmission substation failures. Management is always ready to assist when a request is made by operations personnel.

2.2.3 Operational Alignment

Organizational structure supports safe and reliable system operation.

Lakeland Electric has the appropriate interconnection agreements with neighboring utilities. The agreement for reliability coordination is with FRCC, with Florida Power and Light as the operating agent.

FMPP is Lakeland Electric's balancing authority, with Orlando Utility Commission acting as the agent. The agreement for balancing is actually among the pool members. The balancing agent performs load forecasting, unit commitment, and automatic generation control for the members of the pool. This provides the most economical dispatch of generation and interchange for the members.

Lakeland Electric has not delegated any transmission operator functions to others and has not been delegated to perform functions on behalf of others.

Transmission system outage requests are first received by the system operators. The approval process begins with the system operators approving, denying, or asking the planners to study the request. It is up to each system operator to determine if the request should go to the planners. The request, when approved locally, is entered into the Florida Transaction Management System (FTMS), an FRCC outage scheduling application. This system provides outage information for all transmission operators in the FRCC Region. The FRCC operations planning coordinator provides additional study and approves or denies the request. When an outage request is completely approved, the system operator may produce the switching orders. Orders are reviewed by at least one other system operator prior to the implementation. Affected neighbors are notified prior to the actual switching process.

The system operators have a checklist to use at shift turnover.

Since the 2005 readiness audit, Lakeland Electric has implemented a document control template for the system operations procedures. The evaluation team recommends that Lakeland Electric expand the use of this template to other documents used in system operations.

2.3 Managing System Configuration

Power system configuration is carefully designed, analyzed, maintained, and controlled throughout the life of the infrastructure, ensuring that system and equipment margins are understood, considered in decision-making, and managed consistent with design and system requirements.

The EMS at Lakeland Electric does not include state estimation or real-time contingency analysis. Lakeland Electric relies on the FRCC reliability coordinator contingency analysis program in real time to identify system problems. Lakeland Electric provides data to the FRCC reliability coordinator for use in its models. The reliability coordinator reports any problems discovered and may direct corrective actions. When unexpected outages occur or abnormal voltages or unusual flows are identified, the transmission planning staff will often study the event and provide support to determine what, if any, corrective actions are required in the short and long term.

For internal, short-term studies, Lakeland Electric transmission planning staff utilizes the weekly/monthly available transfer capability cases prepared by FRCC staff. The weekly cases are updated every Monday and Thursday and cover the peak, intermediate, and light-load timeframes for each day of the following week — a total of 21 cases. Each case is updated with expected transmission and generation outage information from the FTMS. However, before

using the cases, the transmission planning staff reviews the outages from FTMS to confirm that major outages are correctly reflected in the cases.

Transmission congestion is managed by the FRCC reliability coordinator by using the transmission loading relief method. Lakeland Electric cooperates with the requests of the reliability coordinator in managing transmission congestion.

The reliability coordinator has not identified any critical facilities within the Lakeland Electric system. Therefore, the system has no interconnection reliability operating limits. Lakeland Electric assigns system operating limits to all transmission facilities. The facilities are monitored and alarmed through the EMS.

2.4 Emergency Preparedness

The organization is prepared to manage and mitigate the impact of system emergencies in order to preserve the reliability of the system and to protect the interests of the public.

Lakeland Electric's capacity and energy emergency plan includes all the proper aspects for a transmission system, including load shedding details. The system operators were not familiar with the parts of the plan when asked about them. The balancing authority directs the plan for the power pool as a whole, and the system operators follow the balancing authority's directives. The evaluation team suggests that Lakeland Electric's role with the balancing authority in the capacity and energy emergency plan be included in the training program.

Lakeland Electric has both manual and underfrequency load shedding programs. The manual load shedding is arranged in blocks with real-time load displayed in each block. The underfrequency load shedding plan is in agreement with the regional requirements. The evaluation team noticed that there is considerable overlap between the manual and underfrequency plans and recommends that Lakeland Electric evaluate and minimize this overlap. Generator trip settings are coordinated utilizing lengthy time delays with the underfrequency load shedding program, even though at a first glance it appears that generators might trip prior to underfrequency load shedding completion.

Lakeland Electric has a blackstart and restoration plan that is coordinated with neighbors. The plan is reviewed and drilled at least annually. It includes personnel assignments, frequency control, synchronizing, and critical load information. The plan does not include any declared blackstart units even though some peaking units may be blackstart capable. The operators stated that should start-up power not be available at the interconnection points, they would attempt a blackstart of the Lakeland Electric system. There are no nuclear units to consider in the restoration process.

3. Fundamentals of Maintenance

3.1 General

Maintenance is conducted by skilled personnel to achieve safe, reliable control center equipment and system performance.

The Lakeland Electric maintenance program is essentially on schedule for both transmission and generation. Generation relay testing is performed when a unit is scheduled out of service for routine maintenance.

System failures are analyzed by operators and planning engineers to determine the cause. Misoperations are treated in the same manner; when a problem is found, it is corrected as soon as possible.

There are no regional requirements for Lakeland Electric to install disturbance monitoring equipment. Certain electronic relays have the ability to store events and can be downloaded. Transmission primary relays are taken out of service only when the alternate relays are in service.

3.2 Equipment Reliability

3.2.1 Equipment Performance

The organization achieves high levels of equipment reliability. Equipment problems that impact reliability are resolved in a thorough and timely manner.

Overall, Lakeland Electric transmission and generating equipment has been very dependable. One recent failure at a major substation will take some time to repair due to limited availability of equipment. It is planned that the substation will be back to normal before next summer's peak loads, with the exception of the 230/69 kV autotransformer, which will not be available due to a 30- to 52-week lead time.

To enhance the structural security of the control center, the windows are designed to withstand approximately 150 MPH of wind. When a hurricane is imminent, plywood is installed on the inside of the windows.

The EMS has been dependable, with less than a half hour of outage time during the year prior to this evaluation.

3.2.2 Work Management

Work activities, including corrective, elective, and preventive maintenance, surveillance testing, and modifications, are managed effectively to support safe, reliable operation during both outage and routine periods.

Procedures are in place for reporting EMS and communications problems. These procedures have call-out lists of maintenance personnel. Normally, a single phone number is provided and calls are forwarded to the cell phone of the individual to be called first.

Transmission outages are first studied at Lakeland Electric and then submitted to the Florida Transaction Management System. The balancing authority is responsible for generator outage scheduling in this same system.

4. Fundamentals of Operational Planning

Operational planning provides the technical information and support necessary for safe, reliable system operation.

Lakeland Electric has a 14-step facility rating procedure. This procedure ensures that all neighboring utilities and the reliability coordinator are using the same facility ratings. The system planners provide the Lakeland Electric system model to the reliability coordinator for inclusion in the regional model used for system reliability.

Lakeland system planners are involved with the FRCC Transmission Working Group. This group develops long-range studies to determine which new facilities should be built and when.

When analyzing the impact of transmission outages, Lakeland Electric planners use base case available transfer capability models from FRCC for a specific timeframe. The models are updated with data from the FTMS and then used to study system loading conditions for requested transmission outages.

The planners frequently visit the control room to discuss outage studies. However, there is no documented procedure that determines which outage requests should be sent to the planners. The evaluation team recommends that Lakeland Electric create a set of guidelines for the system operator to follow for determining whether an outage request should be forwarded to the planning engineers or acted upon without further analysis.

The studies produced by the planners are informally discussed with the system operators during the weekly and quarterly meetings, with the operators asking questions about the studies. This process is not formalized or documented, so there is no assurance that all operators have received and understand the study results. The evaluation team recommends that a documented process be produced to ensure these discussions take place.

5. Fundamentals of Training

5.1 General

Training in both specific job-related skills and broader technical fundamentals is used to provide highly skilled, knowledgeable personnel for safe, reliable operations, and to achieve performance improvement.

Newly hired system operators are trained for a year or more before being allowed to operate independently, and will then be working on shift with experienced system operators. All experienced system operators have attended train-the-trainer sessions to better train the new hires. The evaluation team considers these practices to be positive observations.

One lead system operator has been designated as the trainer and spends over 75 percent of his time on training; the evaluation team considers this a positive observation. As additional classes are included in the program, more trainer time will be required. At some point, Lakeland Electric may choose to make this a full-time training position.

Much of the initial training is accomplished by working with experienced operators, and a considerable amount of training is furnished through classes held by the power pool at various locations. Vendor training is used on NERC standards to assist with NERC certification. The trainee is to become NERC-certified within the first year of training. During the training process, the trainee is tested on subjects to determine understanding of the material.

Internal training programs have a written evaluation form filled out at the end of each session. In addition, a discussion/debriefing takes place at the end of each class to determine the value of the class, uncover possible near-term needs, and identify improvements for the future. The trainer reviews the information with the subject matter expert to have the materials, process, and information incorporated into the current program and updated for the future sessions.

The training program for new hires is effective, but the determination of a trainee being ready to work independently is an informal process involving the experienced system operators, the lead system operators, and the system control center supervisor. The evaluation team recommends that this process of determining when a new system operator is ready to work independently be formalized with a sign-off of each person involved in the decision.

Earlier this year, Lakeland Electric hired two new employees to be trained as system operators in anticipation of retirements. The team notes this proactive hiring as a positive observation.

Experienced system operators are assigned to the continuing education hour (CEH) training plan for existing certified system operators. Lakeland Electric, Orlando Utilities Commission, and Kissimmee Utility Authority have formed an FMPP training subcommittee to offer NERC CEH classes to all FMPP members. The classes are based on a higher level of knowledge covering current or future equipment installations; industry events; lessons learned; and updates to current policies, procedures and standards.

Lakeland Electric has both transmission and distribution desks in its control center. Both of these shifts are all filled with NERC-certified system operators. The evaluation team considers requiring NERC-certified operators for the distribution position as a positive observation. The trainees are not allowed to independently fill any shift. The system operators rotate between the transmission and distribution desks frequently, and the team considers this rotation a positive observation.

All Lakeland system operators, excluding the recently hired trainees, have far exceeded the required training. The team notes this extensive operator training as a positive observation.

The evaluation team realizes that training simulators are expensive and those representing a specific system require considerable upkeep. However, the evaluation team also realizes the value of having a training simulator for use in training scenarios. The evaluation team recommends that Lakeland Electric provide, at minimum, generic training simulator training.

Lakeland Electric has 10 electric system operators, 2 lead electric system operators, and 1 control center supervisor who are all NERC certified. The evaluation team cites the control center supervisor's certification as a positive observation.

With only 10 system operators, much of the training requires overtime. When a system operator on-shift attends training, often another is called in on overtime to fill the position. Lakeland Electric is aware of the overtime and continues to monitor the effectiveness of this training method.

5.2 Organizational Effectiveness

5.2.1 Human Performance

Personnel select and apply appropriate human error prevention techniques commensurate with the importance of assigned tasks to minimize the frequency and consequences of events.

The system operators discuss performance at weekly meetings, focusing on any unusual procedures, errors, or misoperations. These topics are also included in the quarterly meetings with all system operators. Lessons learned are passed along to all system operators and eventually included in the training program.

Management will become involved in decision making for catastrophic events, especially when significant amounts of money are involved to correct a situation.

System operator performance is reviewed annually. Any shortcomings are addressed and referred to training.

APPENDIX 1: Critical Infrastructure

APPENDIX 2: Entity Participants

APPENDIX 3: Documents Reviewed
