NERC

NORTH AMERICAN ELECTRIC RELIABILITY CORPORATION

Reliability Readiness Evaluation Report

Transmission Operator

Kissimmee Utility Authority

Kissimmee, Florida

to ensure the reliability of the bulk power system

October 15–18, 2007

116-390 Village Blvd., Princeton, NJ 08540
609.452.8060 | 609.452.9550 fax
www.nerc.com

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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 Kissimmee Utility Authority (KUA) representatives on October 15–18, 2007. This report reflects the views and recommendations of the evaluation team regarding the readiness of KUA to meet its responsibilities as a transmission operator.

Evaluation Team

Lee Gladish*	NERC
Jim Dodge*	Florida Reliability Coordinating Council, Inc. (FRCC)
Steve Wallace	Seminole Electric Cooperative, Inc.
Alan Gale	City of Tallahassee, Florida
Mark Kuras	PJM Interconnection
Jim Hartwell	Northeast Power Coordinating Council, Inc.
John Idzior **	Reliability*First* Corporation

*Team co-leader
**Observer

Organization Profile

Kissimmee Utility Authority (KUA) is a municipally owned electric utility established by the City of Kissimmee, Florida and governed by an independent Board of Directors. The KUA service area covers 85 square miles and serves approximately 65,000 customers.

KUA is registered with NERC as a transmission operator and operates transmission at voltages of 230 and 69 kV. KUA has interconnections with Progress Energy-Florida and the cities of Orlando and St. Cloud, Florida at 230 and 69 kV. KUA has nine distribution substations using a distribution voltage of 13.2 kV.

The Florida Municipal Power Pool (FMPP) is the balancing authority for KUA. KUA is a member of the Florida Municipal Power Authority (FMPA) and is a participant in the FMPA All Requirements Project. Under this agreement, FMPA performs several services for its members, including transmission and resource planning.

KUA is also a member of FRCC and complies with its planning and operating policies, reliability criteria, and NERC reliability standards.

Executive Summary

The evaluation team found no significant operational problems and concluded that KUA has adequate facilities, processes, plans, procedures, tools, and trained personnel to perform the transmission operator functions necessary to maintain the reliable operation of the bulk power system, with no notable exceptions.

The KUA overall organizational culture encourages open communications with management at all levels and is responsive to the needs of its employees. The "open-door" policy encourages free discussion for the continued reliable operation and improvement of the KUA system.

KUA effectively uses technology and training to prepare for system events. To reduce manual operator tasks, the KUA SCADA displays provide a contact list specific to each substation and features an automated load shedding rotation program. To ensure things will go as planned, the training for relocation to the backup center provides monthly testing of the backup center, and the KUA disaster drill contains a step to randomly remove one employee from service requiring participants to exercise succession plans. In order to coordinate with county and city personnel, KUA stations an employee at the county emergency operations center whenever the center is activated.
Three key recommendations were agreed upon by the evaluation team co-leaders and the KUA management staff. These recommendations include ensuring startup power is available for blackstart situations; verifying KUA generators are operated in the appropriate mode to automatically regulate voltage, and strengthening physical security.

Overall, the evaluation team identified 11 positive observations. In addition, the team offers eight recommendations that, if implemented, will enhance KUA'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. Confidential information on cyber security redacted from public report. See discussion in Appendix 1.

2. Training for relocation to the backup center is on a schedule that provides monthly testing of the backup center (Section 5.1).

3. KUA stations an employee at the county emergency operations center any time the center is activated (Section 2.4).

4. KUA has established an automated load shedding rotation program on its supervisory control and data acquisition (SCADA) system, reducing the burden on operators during a system event (Section 2.3).

5. KUA tests its load-shedding rotation program by substituting re-closer operations for breaker operations during the test (Section 2.3).

6. A panic button is located at every substation to enhance personnel safety and emergency response (Section 2.2.1).

7. The KUA SCADA system has wide-area visibility into surrounding systems (Section 2.1).

8. The KUA SCADA displays provide a contact list specific to each substation, minimizing emergency response time (Section 2.1).

9. The KUA disaster drill contains a step to randomly remove one employee from service requiring participants to exercise succession plans (Section 2.4).

10. KUA encourages a culture of open communication at all levels of the organization, resulting in quick response to staff needs, e.g., operator to operator, operator to management, and operator to support staff (Section 1.2.5).

11. Confidential information on physical security redacted from public report. See discussion in Appendix 1.

Recommendations

The evaluation team offers the following recommendations:

1. Confidential information on physical security redacted from public report. See discussion in Appendix 1.*

2. Establish formal arrangements with neighbors for startup power for blackstart situations, or install internal blackstart capability, to ensure resources are available to restart the KUA system after a disturbance (Section 2.4).*

3. Ensure generators are operated to automatically regulate voltage to provide the appropriate response to system conditions (Section 2.1).*

4. Confidential information on plans for loss of control facilities redacted from public report. See discussion in Appendix 1.

5. Review the operations management staffing structure to ensure adequate attention is given to system operations, readiness, and compliance issues (Section 2.2.3).

6. Provide dispatcher simulator training to help prepare operators for system events (Section 5.1).

7. Establish a routine communications protocol for times when a lone operator is on duty to enhance personal safety (Section 2.2.1).

8. Confidential information on communication systems and support redacted from public report. See discussion in Appendix 1.

*Jointly identified by the company and lead evaluators 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 the *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.

KUA's corporate goals support safe and reliable operations. The company mission statement and primary corporate goal — "To provide reliable and economical services to our customers while partnering with the community and the environment" — is prominently displayed on the corporate page of KUA's Web site. By being governed by an independent Board of Directors, KUA is generally isolated from any fiscal impacts that may affect the city government.

Employees are encouraged to "take ownership" rather than just be an agent. Each KUA employee is given annual performance goals that are agreed upon by the employee, and achievement is tracked.

All KUA employees that were interviewed by the team indicated that KUA has an executive management open-door policy encouraging communications among all levels of the organization. KUA management supports the system operators' training needs and the system operators indicated a positive attitude toward training and management's support of training. KUA participates in and has received a Platinum-level designation from the American Public Power Association Reliability Improvement Program (RP_3).

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.

Strategic planning includes input from all levels of the KUA organization. At the corporate level, priorities for the funding of system reliability improvement initiatives are determined by a budget review group. All funding requests are submitted by the department along with justifications for project. The budget review group reviews the requests and assesses the project for the overall good of the company. Any reasonable request for system reliability improvement has not been denied.

The KUA system operators and staff get along very well with the executive managers. The system operators maintain a professional environment in control room. The executive managers routinely visit the control room, and KUA has an open-door policy for all employees to talk to any management person.

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.

KUA actively participates in industry forums (within the Florida organizations such as FMPP, FMPA, and FRCC), committees, working groups, and task forces. Participation in the groups helps KUA enhance awareness of industry trends and continually improve its operation, while contributing to the activities of the various groups.

KUA monitors operational performance and improvement using annual performance goals for all employees, SAIDI and CADI reliability indices (interruption statistics), and the American Public Power Association Reliability Improvement Program.

KUA analyzes significant system events using its "post-mortem" process (commonly called a "lessons learned" process). Major system problems and outages are discussed at the executive management and CEO level. Any policy or procedure changes resulting from these reviews are documented and distributed to the operating personnel using the KUA procedures change process.

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.

KUA has demonstrated its commitment to reliability by resolving all recommendations from the previous NERC reliability readiness audit.

KUA has established criteria in its procedures manual for performance evaluations so that employees are evaluated for the same areas, points, and performance levels. Individual performance reviews are performed annually. Department goals are established quarterly and reviewed with the general manager; a status assessment is part of the review.

KUA uses a standard progressive discipline procedure as its corrective action program. After a review of the circumstances, the appropriate action is taken. The KUA progressive discipline goal is to fix the problem, not terminate the employee.

Operational lessons learned are incorporated into the corporate culture by use of the post-mortem process briefly described earlier. KUA analyzes non-routine events at different levels of management based on the severity of the event. If human error is determined, the employee is counseled or assigned further training. If procedural changes are required, recommendations for

change are processed through the KUA procedure revision process. If a capital improvement is required, it is approved through the budget process. KUA regularly reviews the effectiveness of all corrective actions at executive staff meetings.

Human error prevention techniques include multiple coordination requirements between plants and system operations, multiple parties reviewing switching orders, safety training for increased employee awareness, and the use of event recorders to help determine event causes.

Upon implementation of any KUA emergency plan, department heads are automatically notified, a corporate communications liaison is brought in, and a command center is activated to handle customer calls.

1.2.4 Human Resources

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

KUA has a succession planning program that is reviewed annually and when required by unforeseen events. The KUA human resources department works closely with each department to determine potential retirements, interviews employees concerning retirement plans, and works with the division vice president to develop plans for replacements. The human resources staff analyzes the difficulty to replace each position and time required to develop replacements. KUA has an emergency succession plan reaching two positions down for each level of management. The plan is revised annually.

The KUA process to select candidates for key positions requires a greater attention to detailed qualifications, background checks, previous employers, and references. All prospective employees have a final interview with the KUA general manager for the authorization to hire.

KUA offers a tuition reimbursement program for personal and professional development as well as an employee mentoring program to help individuals progress within the organization. KUA prefers to select in-house candidates for the system operator position. Current employees can come in on their own time to observe, train, and work with the system operators if they are interested in moving up to the system operator position.

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.

KUA has an open-door policy and promotes frequent communication among all levels of its staff. Each employee is required to meet with his or her immediate supervisor every week. KUA senior executives communicate with system operations primarily through the system operations manager and daily contact with a staff engineer who visits the energy control center every morning. The vice president will also occasionally attend the weekly system operator meetings.

KUA has a process to e-mail newly developed procedures to system operators. Operators review the procedures for accuracy allowing KUA to make improvements before the procedures are issued. KUA has a documented process to notify system operators of changes to company policies and procedures. KUA also holds regular system operator meetings to discuss any operating issues and concerns.

The evaluation team cites a positive observation that KUA encourages a culture of open communications at all levels of the organization providing quick response to staff needs, e.g., operator to operator, operator to management, and operator to support staff.

2. Fundamentals of Operations

2.1 General

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

The KUA system operators are knowledgeable and have a clear understanding of their authority and responsibility and KUA's communications requirements with and among the reliability coordinator, interconnected neighbors, and FMPP. The operators monitor the KUA transmission system and are prepared to take actions to mitigate any unacceptable conditions.

The KUA SCADA system provides wide-area visibility into surrounding systems. The evaluation team cites this as a positive observation.

Each KUA substation display on the SCADA system includes an emergency contacts list specific to that substation, minimizing emergency response time. Since the KUA footprint covers several different law enforcement agencies (county and local), the evaluation team cites the contacts list as a positive observation.

Because of the large reactive requirements around the KUA system, FMPP has directed the KUA generators to operate in constant power factor mode. The power factor setting is determined by FMPP and communicated directly to the plant operators. It is generally agreed among the affected operating entities that the KUA generators can contribute to reactive power support but cannot control voltage. The evaluation team is unsure of the reactive corrective response available from the KUA generators when operated in the constant power factor mode as opposed to the constant voltage mode. The evaluation team recommends that KUA further investigate the mode of operation to ensure voltage regulators on the generators are operated to provide appropriate response to system conditions. Furthermore, KUA should verify that its generating units are modeled properly in the various FRCC databases to reflect the actual operation.

The KUA system operators have direct control of capacitor banks within the system and control them to maintain a zero net system reactive power flow.

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.
KUA promotes safety as a high priority and maintains a serious "open-door" policy regarding safety. All employees are strongly encouraged to report any safety concerns immediately to any supervisor or safety representative.

KUA employs a safety and worker's comp administrator, working from the human resources department. The administrator directs activities such as monthly safety meetings, surprise visits to working locations, hardhat compliance checks, workplace training, and safety awards. In addition, the administrator provides quarterly staff reviews that include trends, review analysis, and specific repeat statistics. Monthly rewards of time off are given to top safety working groups.

KUA has a panic button located at every substation to enhance personnel safety and emergency response, and the evaluation team notes this as a positive observation.

The KUA system operator shift schedule is managed such that there is only one operator on duty for several hours overnight. Due to the nature of the KUA operation, there is limited interaction between the KUA system operator and other entities, such as neighboring systems, the reliability coordinator, and power plants. It is common for several hours to pass without any communication between the KUA system operator and any other person. The evaluation team recommends that KUA establish a routine communications protocol for a lone operator on duty to enhance personal safety.

2.2.2 Operational Decision-Making

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

Most major operational decisions are discussed at executive staff meetings. Supervisors develop and implement changes for small issues. The review of any substantial changes that impact system operations is done at the senior executive level with input from all levels of the operations organization, including system operators. KUA management receives direct feedback from employees through monthly meetings and open discussions.

2.2.3 Operational Alignment

Organizational structure supports safe and reliable system operation.

KUA is a member of the FMPA All Requirements Project, FMPP, and FRCC. Agreements between KUA and these entities dictate authorities and responsibilities, and KUA benefits from assistance in various functions that are spearheaded by these agencies. KUA registered with NERC as a transmission operator and has not delegated any transmission operator tasks to others.

The KUA system operators work a 12-hour schedule, with one operator on duty at night and two on duty during the day shift. The "secondary" system operator is on duty from 7:00 a.m. to 7:00 p.m. during the winter months and from 9:00 am to 9:00 pm during the summer months. KUA

does not require the secondary system operator position to be NERC certified, as it is under the supervision of the primary system operator. The secondary position is day-shift only and primarily deals with distribution issues. The evaluation team reviewed the system operator shift schedule and verified that the KUA system operators are NERC certified as required. KUA is currently overtime-dependent for the system operator shift schedule but has plans to reduce the overtime by adding another system operator to allow for a training period that is not "on shift."

KUA has a document titled *System Operator's Authority* signed by the manager, system operations and the vice president, engineering & operations that provides operators with the authority to take emergency actions, including shedding firm load. The KUA operating procedures also provides the system operator the authority and expectation to shed load to maintain reliability without the need to seek higher approval.

The control room has two operating consoles. The primary console has two SCADA monitors and a GIS monitor used for customer outage calls. The secondary console has two SCADA monitors. Internet and intranet terminals, separate from the SCADA system, are also on both consoles.

System operators record shift notes in a SCADA system-notes display. The display has a column with each system operator's initials, and operators check a box to show they have read the logged entry. The system also has a display for reference items to review when taking over a shift position. KUA uses e-mail to notify the system operators of changes to NERC standards, the FRCC handbook, or KUA procedures. These emails have receipt notification for confirming to the sender that the system operator has received the document notification. System operator meetings include discussion of new documents and a roster for system operators to sign confirming that new documents are understood.

KUA has a formal document control procedure and tracking system using a standardized format to identify ownership and review cycles. The evaluation team suggests that KUA include the revision date in the header of the document when the revision-tracking sheet is not included in the system operator handbook to ensure the correct revision is available to the system operator. The system operators have electronic access to all documents as well as a separate desk manual at each console and at the backup facility for the items particularly directed towards them.

The KUA system operators also use the Florida Transaction Management System (FTMS) for information on generation scheduling and transmission line outages. The FTMS display identifies any new messages not read since the last time the display was viewed by the on-shift operator.

The evaluation team noted that the first line management/supervisory staff perform a multitude of functions from daily supervision and planning to training, compliance, and readiness. The evaluation team recommends that KUA review the operations management staffing structure to ensure adequate attention is given to system operations, readiness, and compliance issues.

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.

KUA has adequate tools to operate its system and has good visibility into neighboring systems. KUA does not have a state estimator, a real-time contingency analysis program, or operator power flow tools, but the evaluation team does not see the need for these tools for the KUA system.

The KUA SCADA system provides good functionality for the system operators. A voltage display contains all KUA substations, and voltage levels are color coded: red for 230 kV, yellow for 69 kV, and blue for 13.2 kV. The voltage display has a value for total net KUA system reactive flow (reactive area control area) — the KUA operating philosophy is to try to keep this net value at zero. A reactive resources summary display indicates the total capacity of each resource item, the amount actually in use, the amount in reserve, and the operating status. This display also indicates the automatic voltage regulator status of the major KUA generating units. System frequency is monitored from three select points — the center, the east, and the southwest area of the KUA footprint. A notes page associated with each substation lists who to call for emergencies at that specific substation. The SCADA system has trending capability; however, most system operators do not use it. The SCADA supervisor can gather data in history format if needed. The KUA SCADA system has had no down time in the past year other than a power supply failure within the building.

Alarms are color coded to identify the severity of an alarm, and an associated audible tone is louder for more critical alarms. The SCADA system has a summary display that shows the health of all processes and a monitor that indicates the alarm processor is working properly. The system operator will receive an alarm if the alarm processor fails.

KUA uses manually switched capacitor banks on the 13 kV distribution system and transformer load tap changers on the 69 kV systems to control system voltages. KUA operates to maintain a normal range of 13.4 to 13.8 kV and 68.5 to 69.5 kV, respectively.

A regional control display indicates all KUA distribution feeders that are used for manual load shedding and includes real-time loadings. The system operator implements manual load shedding using a SCADA program; the operator enters a MW amount, and the SCADA program calculates the feeders required to supply the load reduction requested. The program rotates the feeders on a 20-minute cycle. The evaluation team cites a positive observation for the automated load shedding rotation program on the SCADA system reducing the burden on operators during a system event. Another positive observation is the load shedding simulation test performed by the SCADA program that can simulate rotating feeder trips without actually tripping feeders in real-time operation. In the event that automatic underfrequency load shedding had already occurred, the SCADA program can identify which feeders are already tripped and move to other feeders. The first two steps of the automatic underfrequency program are not included in the manual load shedding procedure. There is about 38 percent overlap of the two programs.

KUA uses The Weather Channel for current weather information during hurricane season and Weather Sentry satellite service to capture lightning strikes in the area.

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.

KUA has adequate plans and training for response to system and local emergency conditions.

KUA runs an exercise called "disaster drill day" each April to test the activation of the emergency operations plan. The drill is based on a different scenario each year, including events such as hurricanes, epidemics, and terrorist activities. All KUA employees participate in these drills with the exception of those with direct customer contact, who must remain on duty. The disaster drill contains a step to randomly remove one key employee from service requiring participants to exercise succession plans. The evaluation team cites this step as a positive observation. The results and evaluation of the performance during the disaster drill usually generates suggestions for revisions, and these changes are reviewed and incorporated in the emergency operations plan prior to June 1. KUA also performs a separate plan review annually, and updates it as necessary.

KUA stations an employee at the county emergency operations center any time that facility is activated — typically an engineer from the Engineering & Operations department with thorough knowledge of the KUA system. If required, employees from other departments such as Power Supply may be assigned this duty. This KUA employee provides a liaison between county and city emergency personnel and KUA to coordinate emergency efforts. The evaluation team cites this practice as a positive observation.

The KUA system restoration plan provides for the restart of the KUA system from external resources. KUA does not have blackstart-capable units nor does it have synchronizing capabilities at its points of interconnection with other systems. Cranking path power is needed to start the KUA generators. The system restoration procedure is fully documented, but KUA has no formal agreements with neighboring systems for startup resources in event of a blackout. The evaluation team recommends that KUA establish formal arrangements with neighbors for startup power for blackstart situations or install internal blackstart capability to ensure resources are available to restart the KUA system after a disturbance.

For capacity and energy emergencies, KUA provides corporate response and support for communications to customers for voluntary load reduction and coordination with local and state authorities. KUA activates an emergency command center to relieve the system operator from duties that require communications with external parties. The vice president of engineering and operations typically supervises the command center activities, while the manager of system operations provides the interface contact between the operations control center and the emergency command center.

3. Fundamentals of Maintenance

3.1 General

Maintenance is conducted by skilled personnel to achieve safe, reliable control center equipment and system performance.
The KUA system operators are the primary users of the SCADA system, and they are supported by the SCADA/Communications supervisor and technicians. The KUA system operator reports problems detected with any communication or control system to the supervisor of SCADA/Communications or a designee. Most reports are done by telephone. Problems involving the acquisition of telemetry, or the display and dissemination of these data, are the responsibility of the SCADA technicians. Problems involving the standard telephone communications, including the FRCC reliability data link, are the responsibility of the corporate information technology department. The SCADA/Communications technicians carry a KUA cell phone and can respond to any maintenance issues on a 24-hour basis. The KUA SCADA/Communications technicians are highly skilled and responsive to system maintenance issues.

The KUA process to track the resolution of problems includes a maintenance log for unique problems and notes on a white board in the control room until the issue is resolved.

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.

The KUA SCADA system has recorded nearly 100 percent availability over the past year. The only unavailable period was a 15-minute event when the building power was lost and the uninterruptible power supply system failed. It was not a failure of the SCADA system itself. During this failure, the backup site systems were operational and no system data were lost.

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.

The KUA supervisor of SCADA/Communications approves any software updates and modifications to the SCADA database. KUA uses a development system for all non-database changes and performs testing in real time to monitor the performance of system changes before installing them on the operational servers. The system operator approves the timing of any change installation, which is usually done during low activity. The installation is fully planned and reviewed with the system operators, and system operators staff the backup control center during the installation. The old software is maintained on the backup computers until the changes are fully tested in real-time operations, sometimes as long as six months.

4. Fundamentals of Operational Planning

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

Most operational planning and coordination among KUA and its neighbors is done through FRCC with current-day, next-day, weekly, monthly, and seasonal assessments. FMPA performs current- and next-day studies, and reschedules maintenance activities accordingly. KUA also participates in the daily FRCC reliability coordinator call where all participants discuss generator and line outages, flow-gate issues, temperature and loading limits, and available solutions to remedy any anticipated problems.

The FRCC Available Transfer Capability Working Group develops base case system models for the next seven days based on data submitted by the Florida companies. Each day, FRCC completes a next-day analysis by 4:00 p.m. and sends an e-mail to the system operators. If a problem is identified, a group phone call is held with the system operators of the affected systems to talk through available actions to resolve the issue.

KUA has no identified system operating limits or interconnection reliability operating limits.

The KUA internal planning efforts are performed by a consultant. The results of these seasonal studies are presented to the KUA system operators, who also receive a copy of the studies. The evaluation team determined that the communications of system planning results with the system operations personnel is adequate.

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.

KUA assigned oversight of the system operator training program to the lead system operator.

KUA solicits new candidates for operator trainees using internal job postings and external advertising in industry trade publications. The majority of recent hires have been internal candidates. The KUA selection process includes written tests, in-depth interviews, reference checks, and criminal background checks.

For initial training, the first priority is to obtain NERC system operator certification. Initial training includes vendor-provided online training and on-the-job training. Once a trainee is verified competent in all areas of the KUA operation, KUA administers a final oral interview. The manager of system operations makes the final determination for when a trainee is competent to operate alone, with input from the lead system operator and other experienced system operators.

KUA provides continuing training through internal and external sources. External training seminars are provided by vendors and regional groups, such as FRCC and FMPP. KUA provides internal training using online vendor-provided programs and formal classroom sessions. KUA is a NERC-approved continuing education provider, with 48 hours of approved courses.

KUA provides specific annual training on seasonal operating assessments using classroom lectures, regional system restoration drills, and backup control center operation drills. The training for relocation to the backup center is on a schedule that provides monthly testing of the backup center, and the evaluation team notes this arrangement as a positive observation. KUA uses training session evaluations and employee feedback on courses attended to analyze training effectiveness and improve its training program. KUA reviews every training document annually and as training requirements change.

The evaluation team believes that it would be beneficial to the system operators to have dispatcher simulator training and recommends that KUA provide access to simulator training via online applications or other available means.

The KUA trainer has attended "train the trainer" courses sponsored both regionally and by NERC, and is an active member in the FMPP training group.

The KUA management supports other personal development training by offering general training, such as computer classes on Word, Excel, and PowerPoint.

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.

KUA uses a peer review technique for human error prevention in the preparation and execution of switching orders. The process begins with an engineer preparing the first draft of switching orders. The on-duty system operators then review the orders to check for accuracy, sign to indicate approval, and e-mail the order to employees who will execute the switching.

KUA has policies and procedures established by the Human Resources department to ensure that all employees (full-time and contract) are treated similarly with regards to performance standards. Individual contract terms may delineate additional metrics for contractor personnel.

KUA uses progressive discipline techniques for corrective action. Based on review of circumstances and actions, KUA may employ oral warnings, written warnings, suspension, or termination. Certain actions — such as insubordination, gross negligence, and conviction of a law violation — can result in immediate dismissal. If safety or security is in question, the employee is immediately removed from the work place and due process is administered after-the-fact.

APPENDIX 1: Critical Infrastructure

The following discussion will be presented under private letter to the evaluated entity only and will not be included within the public version of the report.

APPENDIX 2: Entity Participants

The following will be presented under private letter to the evaluated entity only and will not be included within the public version of the report.

APPENDIX 3: Documents Reviewed

The following will be presented under private letter to the evaluated entity only and will not be included within the public version of the report.