TECO
TAMPA ELECTRIC
AN EMERA COMPANY

TAMPA ELECTRIC an Emera COMPANY

RADIATION SAFETY PROGRAM

Revised August 2017

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1.0 RADIOACTIVE MATERIALS

1.1 Regulatory Overview

Tampa Electric Company (TEC) possesses radioactive sources contained in portable gauges, fixed gauges, and laboratory instruments. Appendix II is a list of sources and locations. These sources are licensed under specific and general licenses. Big Bend Station and Polk Power Station have specific licenses. Environmental Affairs has a general license.

All radioactive materials possessed under various radioactive materials licenses are subject to this Radiation Safety Program manual. The possession, use, transport, transfer, and disposal of radioactive materials are subject to Florida Statute Chapter 404 and rules of the State of Florida Department of Health and Rehabilitative Services (DOH), Control of Radiation Hazards, Chapter 64E-5, F.A.C.

1.2 As Low As Reasonably Achievable (ALARA) Program Commitment

The purpose of the ALARA Program is to maintain radiation exposures to a minimum, as mandated by Chapter 64E-5, F.A.C.

As part of the TEC Radiation Safety Program employees who use portable and fixed gauges are instructed in the procedures and precautions to be used to keep their radiation exposure as low as possible.

TEC maintains procedures, equipment, and facilities to reduce exposures. Procedures, including updates, are reviewed with applicable personnel.

TEC has two facilities using portable and/or fixed gauges and a lab, which has gas chromatography devices under a general license. Each facility has a Facility Radiation Safety Officer (FRSO). TEC also has a Corporate Radiation Safety Officer that serves as the point of contact with the Florida Department of Health. A Radiation Safety Committee provides oversight of this program. TEC's management is committed to the ALARA philosophy and to maintaining a safe working environment. The ALARA philosophy is presented to all gauge users.

TEC conducts a Radioactive Materials audit annually. It focuses on the regulatory requirements and it is used to determine if radiation exposures are being kept to a minimum. The review determines if modifications to the TEC Radiation Safety Program are needed and provides recommendations.

The Corporate RSO discusses activities with facility personnel, review of documentation required by the license or Chapter 64E-5, and a walkthrough. A final report is filed noting if any deficiencies were found and any corrective actions taken and discussed at the Radiation Safety Committee. Personnel, who work with the fixed and portable Troxler gauges at Big Bend receive USDOT and ALARA training.

Corporate RSO 

Management Representative 

1.3 Precautions

1.3.1 Each Authorized User who has declared pregnancy shall inform the facility RSO and the Corporate RSO.

1.3.2 Any TEC facility engaging in the use of radioactive materials must assure that individuals under eighteen (18) years of age and/or pregnant do not handle radioactive materials and are not exposed to radiation in excess of 100 mrem/year.

1.3.3 The facilities should determine if new employees that are considered as Authorized Users (AUs) have been previously exposed to radiation and obtain documentation of the exposure. This documentation can be obtained from the employee's previous employer, ATTN: RSO. A letter of the accumulative dose should be forwarded to the TEC RSO by the previous employer, if available. Duties of the new employee should not be limited during the waiting for the previous employer's dosimetry report.

1.3.4 TEC portable gauge AUs are not monitored for their radiation exposure because their use of radioactive materials is logged and kept to a minimum. The portable gauges are used approximately once a quarter to determine density of the coal pile. The use of the gauges is rotated between applicable authorized portable gauge users at each station. The Radioactive Materials Usage Log (Appendix D) is used to document gauge usage.

1.3.5 Industrial radiography is performed at the TEC facilities by contractors. Compliance with proper operation of the radioactive device is under the jurisdiction of the contractor's radioactive materials license. As a precautionary measure, each station has a procedure to minimize non-destructive testing ("x-ray") exposure to plant personnel when outside contractors are operating in the facilities. Each site RSO is to assure proper completion of the attached Appendix B for a Radiography Check Sheet and Appendix B1 for the Polk station. This report is to be maintained by the Facility RSO upon completion of the activity.

1.4 Operating and Emergency Procedures

Authorized Users shall be instructed in and have access to the Corporate Operating and Emergency Procedure involving radioactive materials. No individual is permitted to operate equipment other than as specified in the procedures and the radioactive materials license. No individual shall bypass a safety device or interlock. The attached Radiation Work Permit will be issued for the handling of fixed gauges (Appendix C).

1.4.1 General Rules of Use

1.4.1.1. All gauge-related operations, including routine cleaning and maintenance, must be in accordance with the gauge manufacturer's instructions and recommendations.

1.4.1.2. ALARA philosophy. All personnel working with fixed gauges must follow the ALARA philosophy – keep radiation exposures as low as reasonably achievable. The objective is to reduce occupational and public exposures as far below regulatory limits as reasonably achievable by means of good work practices. The following methods are used to minimize radiation exposures;

Minimize the TIME spent in close proximity to the gauge (the shorter the time, the lower the dose);

Maximize the DISTANCE from the gauge (doubling the distance reduces radiation intensity by one quarter); and

Make use of available SHIELDING to block radiation.

1.4.1.3. If damage to a gauge is suspected, immediately notify the RSO who will arrange to have radiation survey of the gauge performed as soon as possible. Refer to the emergency procedures for further instructions.

1.4.1.4. Personnel are prohibited from entering any hopper, vessel, conveyor system, or other area where radiation levels exceed 2 mR/hour until the source holder has been locked out in accordance with the gauge lock-out/tag-out procedure.

1.4.1.5. Opening or removing a source from its housing is prohibited.

1.4.2. Advanced Services

1.4.2.1. Advanced activities include gauge installations, non-routine maintenance or service, relocations, and removal from service and placed in storage. Gauge maintenance or repair that requires removal of the source is prohibited. Only advance authorized users (individuals that have completed a 40-hour approved training course) or workers under their direct supervision and in their physical presence are authorized to perform advanced activities. (Refer to Appendix A – Definitions of Advanced Authorized User)

Prior to conducting any of the permitted activities, an AAU is to prepare a RWP. As such, the AAU will perform a survey to assure that the shutter or closing mechanisms are functioning properly and are closed, where applicable. A record of the completion of this survey shall be made on the RWP. After the removal, relocation, maintenance or repair and the device is either reinstalled or placed in storage, a final survey shall be performed with a record of the completion of the survey kept on the RWP.

1.4.2.2. Gauge installations and relocations will include radiation surveys. Surveys will be taken at 1 foot around the source holder and detector to verify that the source is property shielded and aligned with the detector. Measurements will also be performed to establish the 5 mR/hour boundary (to determine if "Caution – Radiation Area" signs must be posted) and the 2 mR/hour boundary (to determine the restricted area perimeter). Radiation surveys will be documented and maintained on file.

1.4.2.3. A copy of the appropriate manufacturer's operation manual must be available with applicable instructions followed.

1.4.2.4. The Radiation Work Permit (RWP) as described in Appendix C must be used for Advanced Services. An RWP is a written document remaining on-site until completion of the task. Completed copies shall be maintained for inspection by the DOH. The RWP shall:

1.4.2.4.1. Authorize specific individuals to enter and work;
1.4.2.4.2. Establish "Lock-Out" procedures for each device;
1.4.2.4.3. Outline the specific job to be done;
1.4.2.4.4. Outline instructions on the safe and correct handling procedure prior to work commencing;
1.4.2.4.5. Outline survey results; and
1.4.2.4.6. Outline a specific time period that a given worker may conduct activities based on proximity to the source.
1.4.2.4.7. Be placed in a plastic cover hanging on the Radiation Area Caution tape or as otherwise providing it being obviously displayed.

1.4.2.5. The RSO shall approve and document by means of a RWP the installation, relocation, or movement to storage, of devices containing radioactive materials. This documentation shall include:

1.4.2.5.1. Radioactive Material (element and mass number)
1.4.2.5.2. Manufacturer & model number of the sealed source & device
1.4.2.5.3. Previous location (building number, name, site in building)
1.4.2.5.4. New location (building no., location in bldg) - facility address
1.4.2.5.5. Survey of the source holder to assure the shutter is closed. Indicate maximum survey readings taken at directional points of the device (top, bottom, etc.) both at the surface and at a distance of one foot.
1.4.2.5.6. The model and serial number and calibration date of the survey instrument used.
1.4.2.5.7. During the survey, a reading of greater than 5 mR/hour at 30 cm from the source shall required posting as a radiation area.
1.4.2.5.8. For movement to storage, the device is to be surveyed collectively with the other sources in storage to assure that the radiation levels are within a Radiation Area level.
1.4.2.5.9. Serial number of the source holder
1.4.2.5.10. Date performed
1.4.2.5.11. Transportation documentation, if necessary
1.4.2.5.12. Persons involved in the transfer

1.4.2.6. The AAU shall inspect the site of the gauge to be removed and any area for storage of the removed gauge before the permit is issued to determine which gauge is to be handled, that the sites are safe, that safety equipment is in place, and that established safety precautions have been taken. The AAU shall assure that access to the Radiation Areas are restricted using physical barriers or having personnel immediately present to monitor ingress and egress of other personnel.

1.4.2.7. Calculated exposure shall be conducted as part of the RWP. The AAU shall utilize the calculated exposure as the assigned dose for the workers for that task. The AAU shall inspect the site before the permit is issued to close or have closed and locked the source shutter, where applicable, and survey the area with a calibrated survey meter. Based on the survey result, time restrictions must be calculated to establish time limits for work tasks based on proximity of a radiation worker to the source, thereby limiting individual exposure to no more than 2 mR/hr or 125 mrem/quarter dose. This is the administrative control to assure that radiation workers will not exceed 10% of the allowable annual dose.

1.4.2.8. Ancilliary personnel who help with the permitted activity beyond the radiation area boundary (e.g., crane or hoisting operator, welder or helper) shall be authorized by the AAU and be given an orientation as the radiation hazards commensurate with the job. The auxillary personnel cannot use a survey meter or make any decisions regarding dose levels. Based on the survey result, time restrictions must be calculated to establish time limits for work tasks based on proximity of a ancillary worker to the source, thereby limiting individual exposure to no more than 2 mR/hr or 100 mrem/year dose. This is the regulatory limit for members of the public.

1.4.2.9. A barrier, rope, sign, or other indicator of a permit work area may be around the work area, as necessary, to advise other personnel of the restricted access area. The barrier shall be posted, "RADIATION AREA."

1.4.2.10. "Lock-out" procedures specific to radioactive materials as addressed in these procedures shall be observed for each device to prevent inadvertent opening by the

shutter and unwanted exposure to the employees. As a minimum, these procedures shall include:

1.4.2.10.1. Review of the shutter operation to understand the shutter mechanism fully, if applicable;

1.4.2.10.2. Means to ensure the source holder is locked in the "OFF" position during maintenance, repair, relocation or other work in, on, or around the bin, tank, hopper, belt or pipe on which the device is mounted.

1.4.2.10.3. These lock-out procedures are not applicable for Low Activity Sources (LASs) with microcurie sources that do not have shutter mechanisms (per Sealed Source and Device Registry documentation). Manufacturer-supplied shipping cover will be put into shipping position for storage or transfer of these units.

1.4.2.10.4. Lockout procedures shall be posted (64E-5.315) as part of the radiation work permit. Tag requiring use of RWP are posted on each source holder in lieu of posting the procedures themselves.

1.4.2.10.5. Prior to return-to-service following movement of any gauge, appropriate radiation signs shall have been installed and the gauge secured in its installed location. A survey is required following installation or relocation activities. If necessary, a leak test will be performed to be in accordance with procedures outlined in the leak test procedures.

1.4.2.10.6. Following completion of all work and the return-to-service of the gauge, the RWP must be signed by the facility RSO. The completed permit then will be forwarded to the RSO's office be filed.

1.4.2.10.7. Work conducted in an area where the exposure rates are less than defined as a "Radiation Area" does not require personnel monitoring. This provision of the procedures is conditional that the calculated quarterly dose for a Radiation Worker does not exceed 125 mrem per quarter; or, 10% of the quarterly dose for an occupational worker. The exception would be in the event of an emergency as described in the emergency procedures below.

1.4.2.11. Conditions Lock-Out

1.4.2.11.1. Prior to any work being performed in the immediate vicinity of a gauge radiation beam when a distance or gap exists between a gauge's radioactive source and the radiation detector that permits entry of all or a portion of a person's body into the primary radiation beam;

1.4.2.11.2. During any manipulation of a gauge, including the source holder or the detector, which involves physical movement of the device or separation from a pipe, vessel, etc. including installation, relocation or storage;

1.4.2.11.3. When individuals are working on or adjacent to a gauge during periods of shutdown;

1.4.2.11.4. Whenever an individual enters a vessel in which such a gauge is located; and,

1.4.2.11.5. Whenever a vessel with such a gauge is empty and an individual is working around the exterior of the device.

1.4.2.12. Lock-out/Tag-out specifications

1.4.2.12.1. Lock-out devices will consist of either a key or combination lock capable of holding the gauge in the safe (closed) position s1uch that the gauge cannot operate until the lock-out device is removed. Lock-out devices will be substantial enough to prevent removal without the use of excessive force or unusual techniques.

1.4.2.12.2. Tag-out devices will consist of a durable tag and a means of attachment that can be securely fastened to the gauge to indicate that the gauge may not be operated until the tag-out device is removed. Tag-out devices will be substantial enough to prevent inadvertent or accidental removal, and able to withstand the ambient environment for the maximum period of time that exposure is expected. Tag-out device attachments will be of the non-reusable type, attachable by hand, self-locking, and non-releasable with a minimum unlocking strength of no less than 50 pounds, with the general design and basic characteristics at least equivalent to a one-piece, all-environment-tolerant nylon cable tie. Tag-out devices will warn against hazardous conditions if the gauge is operated and must include a legend such as Do Not Open or Do Not Operate. Tags shall be legible and understandable to all personnel who may be in the area.

1.4.2.12.3. Lock-out and/or tag-out devices will indicate the identity of the individual applying the device(s). Lock-out and/or tag-out devices will be standardized in at least one of the following criteria: color; shape; or size, and the print and format of tag-out devices will be standardized.

1.4.3. Instrumentation Usage.

Each facility RSO has the responsibility to assure that proper instrumentation is on site for performing surveys of the gauges. The instruments shall be calibrated yearly. Training in proper usage is required prior to usage. The manufacturer's manual will be the guide for proper usage. Care and maintenance of the instrument will be in accordance with the manufacturer's instructions. Prior to usage, the instrument will be turned on, allowed to warm up, battery checked, calibration checked, response checked, then used and stored. If not usable or out of calibration, the instrument will be tagged out of service.

1.4.4 Postings

Chapter 64E-5, F.A.C. requires labels, signs, symbols, and procedures to protect individuals and to assure that exposures are as low as reasonably achievable.

1.4.4.1. Radiation Areas

Radiation areas, such as hoppers, are required to have the following posting:

CAUTION - RADIATION AREA or RADIATION HAZARD

1.4.4.2. Storage Areas

Each area or room where radioactive materials are used or stored shall be conspicuously posted with a sign bearing the radiation caution symbol and the words:

CAUTION - RADIOACTIVE MATERIAL

These areas shall be secured with the key under jurisdiction of the facility, RSO, and/or AUs.

1.4.4.3. Containers

Containers/packages of radioactive materials are required to bear durable, clearly visible labels identifying the radioactive contents. It must also bear the radiation caution symbol and the words:

CAUTION – RADIOACTIVE MATERIAL

Please note that packages carrying portable gauges that are labeled in accordance with regulations of the U.S. Department of Transportation are not required to have additional postings.

1.4.4.4 Emergency Procedures (64E-5.901)

Procedures as outlined in procedure 2.5 are to be posted

1.4.4.5. Notice to Employees (64E-5.901)

The current "Notice to Employees" form as in appendix H is to be posted for review by the workers. This notice describes radiation control regulations, employer and worker responsibilities, radiation exposure reporting requirements and inspection requirements.

1.4.4.6. Lockout Procedures (64E-5.1315)

Lockout Procedures describing instructions for locking out fixed gauges will be conspicuously posted for quick reference in order to prevent workers from entering a gauge's radiation bean during work in, on or around installed gauges. These procedures are described in procedure.

1.4.5. In-Place Activities – Fixed Gauges

Routine, in-place activities supporting the proper care and functioning of the device, such as, cleaning, servicing shutter mechanisms, changing bolts or connecting devices (not relocating the device), replacing ancillary outer parts (such as labels) that have deteriorated, detector electronics, postings, performing inventory, leak testing and lock-out/tag-out activities. These are preventative maintenance activities that do not require a RWP. Routine maintenance is considered "use" and is performed by an authorized user.

1.5 Receiving and Opening Packages

1.5.1 The Corporate RSO will approve or place all orders for radioactive material and ensure that the requested materials and quantities, manufacturer and models are authorized by the license.

1.5.2 Only AUs will open packages containing nuclear gauges. Receipt records will be maintained on file for inspection.

1.5.3 Each package will be visually inspected for any sign of damage. The package will be surveyed as soon as possible to verify that radiation levels are as anticipated. If any damage is noted, the RSO will be notified.

1.5.4 If no damage is evident, the gauge will be stored and locked in the designated storage area until it can be installed by qualified personnel.

1.6 Shipping of Radioactive Materials

1.6.1 Portable Gauge

A gauge is considered to be under transport during loading of the vehicle, movement of the vehicle on public roads, unloading of the vehicle, and during temporary storage of the gauge away from the approved storage area. The Emergency Procedure, Emergency Response Information, and Bill of Lading are located in a yellow folder inside the portable Troxler gauge case. When transporting a gauge, make sure the following steps are observed:

A. Have available in the vehicle and readily accessible to the driver an Emergency Response Information document for the Troxler portable gauge;

B. Have available a Bill of Lading with the proper shipping name in the vehicle and readily accessible to the driver;

C. Ensure that the gauge is locked or otherwise sealed and is inspected prior to shipping. Ensure that the package is physically sound and that each closure device is properly installed, secured, free of defects and located at the farthest proximity from the driver;

D. Ensure that the gauge is transported only in the cargo area of the vehicle, and that it is properly secured to the vehicle to prevent theft, loss, or shifting during transportation. When transporting in an enclosed vehicle, the vehicle must be locked; and

E. When the gauge is in the field, the authorized user (AU) must maintain control over the gauge at all times. Never leave a gauge unattended.

F. Verify the Emergency Phone No. with the facility RSO as being appropriate. When shipping the gauge to the manufacturer, verify with the recipient as to their facility being the Emergency Contact phone number.

1.6.2. Alloy Analyzer

Prior to releasing the device for shipment, insure that the device has passed the most current leak test. When transporting a gauge, please make sure the following steps are observed:

A. Ensure that the gauge is locked or otherwise sealed and is inspected prior to shipping. Ensure that the shutter is in the off position;

B. Ensure that the package is physically sound and that each closure device is properly installed, secured, and free of defects; and

C. When the gauge is in the field, the authorized user (AU) must maintain control over the gauge at all times. Never leave a gauge unattended.

D. Have available a Bill of Lading with the proper shipping name in the vehicle and readily accessible to the driver;

NOTE: For X-ray alloy analyzers, shipping papers are not required.

1.6.3. Bill of Lading

BILL OF LADING

SHIPPER: BIG BEND STATION
13031 WYANDOTTE ROAD
GIBSONTON, FLORIDA 33534

RQ, RADIOACTIVE MATERIAL SPECIAL FORM, N.O.S. UN2974
CLASS 7, TYPE A PACKAGE, CONTAINING:
Cs-137, 296 MBq (8mCi)
Am-241:Be, 1.48 GBq (40 mCi)

RADIOACTIVE YELLOW II LABEL, TI-0.5 **EMERGENCY CONTACT (813) 310-9185**

This is to certify that the above-named materials are properly classified, described, packaged, marked and labeled, and are in proper condition for transportation according to the applicable regulations of the Department of Transportation.

Signature of Shipper: _____

1.6.4..Transferring gauges for Reuse or Disposal

1.6.4.1. Regulations Controlling the Transfer of Radioactive Material are defined in the regulations. Radioactive material is controlled in the State of Florida by the Department of Health (DOH) under Chapter 64E-5, Control of Radiation Hazards, of the Florida Administrative Code (F.A.C.). Waste disposal by transfer to an authorized recipient is allowed by 64E-5.416, as long as the transfer requirements of 64E-5 Part III are met.

1.6.4.2. Before transferring radioactive materials to a specific licensee, the company shall verify that the receiving facility's license authorizes the receipt of the radioactive material being transferred. When returning gauges to the manufacturer, obtain suggested bill of lading to be used.

1.6.4.3. The requirements of 64E-5 Part XV, Transportation of Radioactive Material, are generally stated as follows:

A. The company must ensure that the material is properly packaged, labeled, and the requirements for transportation for the material are met. This can be coordinated with the

disposal contractor, but is ultimately the responsibility of the shipper.

B. All persons shipping radioactive waste to a low-level radioactive waste treatment, storage, or disposal facility, shall notify DOH no less than 48 hours prior to departure of the shipment. The notification shall be made in writing or by telephone and must contain the following information:

- The name, address and telephone number of the generator;
- The name and telephone number of the contact person, designated by the generator, with whom DOH may make arrangements for the inspection;
- The name and telephone number of the carrier;
- The location of departure, if different from the address of the generator;
- The scheduled date and time of departure; and
- The proposed route to the low-level radioactive waste facility.

C. For radioactive waste shipments only the DOH, upon notification from TEC, shall dispatch an authorized representative to the licensee's facility to inspect the shipment. After the inspection is complete, the DOH representative shall affix his initials in the bill of lading signifying the shipment is in compliance.

D. Each generator of radioactive waste whose shipment is inspected by the DOH representative will be billed by the Department a fee shipment inspected. This billing will be paid to DOH within 30 days of receipt of the bill.

E. Notifications regarding waste shipments or Emergencies are required to be addressed to:

F. Department of Health - Bureau of Radiation Control

P.O. Box 680069
Orlando, FL 32868-0069 Telephone: (407) 297-2095

1.7 Radiation Safety Officers and Committee Responsibilities

1.7.1 Radiation Safety Officers (RSO) and Responsibilities

Corporate Radiation Safety Officer
Rosa Webster
Office: (813) 630-7336 Mobile: (813) 310-9185

1.7.1.1. Duties of the Corporate Radiation Safety Officer

The Corporate Radiation Safety Officer is responsible for informing other TEC departments of statutory and regulatory changes as they apply to this program. The Corporate Radiation Safety Officer is responsible for overseeing the implementation of the Radiation Safety Program and for its revision as required by changes in regulation, operation of facilities, or departmental responsibilities.

A. Verify that all terms and conditions of the license and Chapter 64E-5, Florida Administrative Code (F.A.C.) are compiled with and that all emergency procedures and required notices are posted:

B. Verify that the use of gauges is only by individuals that are authorized by the

license;

C. Verify that all records are maintained as required by the license and Chapter 64E-5, F.A.C. These records shall include at a minimum the following: Leak test records, training certification for all users, gauge receipt and transfer records, and inventory records;

D. Verify that gauges are properly secured against unauthorized removal;

E. Verify that all users have read and understood the gauge operating and radiation safety procedures;

F. Perform, or have performed by a qualified expert, an annual ALARA audit of the Program to review the entire radiation safety program to determine that all activities are being conducted safely, in accordance with the department regulations and the conditions of the license, and consistent with the ALARA program and philosophy. The review must include an examination of the records, reports, results of department inspections, written safety procedures, and the adequacy of the management control system;

G. Ensure that the radioactive materials license is amended if required prior to any changes in facilities, equipment, policies, procedures, and personnel;

H. Serve as a point of contact with the Department of Health in the event a gauge is damaged, lost, or stolen, for inspections, and, amendment requests.

I. Notify the DOH in writing within 30 days of a change in RSO of any of the licensees under the TEC authority.

J. Evaluate the need for the implementation of the third-party personnel monitoring. AUs who perform routine services on fixed gauges are not required to routinely wear personnel monitoring devices, unless assisting in the relocation of a gauge under supervision of an Advanced Authorized User. In the event gauges are to be relocated, placed into storage, or removed from storage and installed, the RSO shall assure that the RWP is used and that each person performing the function wear personnel monitoring devices. These devices, if worn, will be exchanged quarterly. In addition, in the event of an emergency whereby the potential exposure rate from the source could be higher than normal, personnel monitoring devices will be used. The routine 'use" of fixed or portable gauges does not require personnel monitoring devices because individuals performing these functions will not exceed 10% of the yearly occupational dose.

1.7.2 Facility Radiation Safety Officers

Gary Garbelman, Big Bend Station
Ben Willoughby, Polk Power Station
Peggy Penner, Causeway Laboratory

1.7.2.1. Duties of the Facility Radiation Safety Officer

A. Ensure that all terms and conditions of the license and Chapter 64E-5, Florida Administrative Code (F.A.C.) are complied with and that all emergency procedures and required notices are posted;

B. Ensure that gauges have been leak tested within the required time frame and that the leak test is performed in the manner prescribed by the gauge manufacturer or by the license;

C. Ensure that use of gauges is only by individuals that are authorized by the license;

D. Maintain all records as required by the license and Chapter 64E-5, F.A.C.;

E. Ensure that gauges are properly secured against unauthorized removal;

F. Ensure that AUs have read and understood the gauge Operating and Emergency procedures;

G. Ensure that licensed radioactive materials are used safely. This includes review as necessary of training programs, equipment, facility, supplies, and procedures;

H. Ensure that licensed materials are used in compliance with department regulations and the license conditions;

I. Ensure that the use of licensed material is consistent with the ALARA philosophy;

J. Be familiar with all pertinent department regulations, the license application, the license, and amendments;

K. Review the training and experience of the proposed AUs to determine that their qualifications are sufficient to enable the individuals to perform their duties and in accordance with the regulations and the license conditions. Recommend new AU candidates to the Radiation Safety Committee;

L. Review on the basis of safety and approve or deny, consistent with the limitations and the ALARA philosophy, all requests to use radioactive material under the license:

M. Establish a program to ensure that all persons whose duties may require them to work in or frequent areas where radioactive materials are used (i.e. nursing, security, housekeeping, physical plant, etc.) are appropriately oriented to include the ALARA philosophy;

N. Recommend remedial action to correct any deficiencies identified in the radiation safety program; and

O. Investigate all known instances of deviation from good ALARA practices and, if possible, determine the causes. When the cause is known, the Radiation Safety Officer will recommend these changes to the Radiation Safety Committee.

P. Maintain a log recording the dose of all workers who have participated with a RWP. At the end of the year, have the employee initial that they are aware of their dose received for the year. When the employee leaves the employment of TEC, the RSO is to send a letter to the employee of the total dose received while working at TEC. This letter is to be sent certified mail, return receipt requested to the last known home address of the employee.

1.7.3 Radiation Safety Committee

The Radiation Safety Committee (RSC) is composed of the Corporate RSO, each facility RSO, the company's radiation consultant who serves as the recorder and as an ex-officio member. A copy of the report is forwarded to management as determined by the Corporate RSO.

1.7.3.1 Duties of the Radiation Safety Committee

A. Review the activities of the facilities and establish common policies to assure that consistency of the program is maintained;

B. Review and approve the candidates that have completed an approved Radiation Protection Program training, or have prior training and experience that meets or exceeds current regulations to become Authorized Users (AU).

C. Review the annual ALARA report and note certain activities within the facilities that could have ALARA implications;

D. Report contract Industrial Radiography activities by outside licensed operators and the status of their performance as it applies to site personnel;

E. Report any problems of record keeping, license management, inspection activities by the Department of Health and obtain assistance, if needed; and,

F. Have a collective body of facility experts in radiation protection to be vigilant in ALARA activities at the plant respective plants.

The RSC is to meet at least annually under the leadership of the Corporate RSO. Minutes of the meetings shall be maintained for inspection by the Department.

1.8 Training of Users

Basic Authorized User Training: A fixed or portable gauge Authorized User (AU) is an individual qualified to perform (and supervise the performance of) general tasks involving a gauge that presents minimal health and safety risks (lock-outs, inspections, shutter checks, leak tests, security, care & cleaning, minor repairs not involving removal of source holder). This includes the performance of repair of the electronic detector (not the source holder); or, cleaning the unit, replacing a radiation symbol metal plate, or other minor repairs performed in place. AUs may participate in "advanced" activities (gauge installations, relocations, maintenance, and repair of the gauge off the pipe) only in the direct supervision of and in the physical presence of an Advanced Authorized User. These advanced activities present an increased risk of radiation exposure requiring personnel to use personnel monitoring devices.

1.8.1. A minimum of 8 hours of formal training covering the subjects listed in subsection 64E-5.1307(1), F.A.C. is required to qualify as a fixed or portable gauge AU. Training will be performed by a third party, authorized by the Department of Health. In addition, instructions will include Operating and Emergency procedures, and supervised hand-on training. A written exam will be required to verify the AU's understanding of the principles. Documentation of compliance with this part of the regulation will be maintained for inspection by the Department.

1.8.2. Availability of AUs means that the AU is capable of being on-site to respond to an incident involving a fixed gauge within a reasonable time. A fixed gauge is considered to be in use when it is mounted in place, even if it shutter is closed and it is locked out.

1.8.3 Advanced Authorized User Training authorizes a user to supervise the installation, relocation, removal of the source holder (not involving the installation, replacement or disposal of the sealed sources containing radioactive materials used in the devices). The persons performing these functions will complete a 40–hour training course authorized by the DOH devices during the

relocation of the source holder.

1.8.4. Hazmat Employee Training

Radioactive material contained in fixed gauges is classified as hazardous material by the U.S. Department of Transportation (USDOT). In accordance with the USDOT regulations (49CFR Part 172, Subpart H) workers must complete hazmat training prior to performing work that directly affects hazardous materials transportation safety. (Exception: employees can work for 9 days without the training, provided a hazmat-trained employee directly supervises them.) Refresher training must be provided at least once every 3 years.

Hazmat training includes general awareness/familiarization, function specific, safety, and security awareness training. It will be provided in-house or by qualified third-party trainers. The training may also be conducted concurrently with other radiation safety training (i.e., radiation awareness training and/or AU training).

Documentation of hazmat training will be maintained for the duration of each worker's employment, and will include the following information:

The employee's name and date of most recent training completed;
Description, copy or the location of training materials used;
Name and address of the person providing the training; and
Certification that the employee has been trained and tested as required.

1.8.5. For portable gauges, the AU directly uses or supervised the use of portable gauges which includes the handling, storage, packaging and transporting that equipment which is authorized by the TECO radioactive materials licenses and requires training as required by the license, procedures, operator manual, regulations or other regulatory document. AUs are required 8 hours of training as outlined in 64E-5.1307 and .1313. Persons as AUs for portable gauges will also receive operational training of the device from the manufacturer or by a representative, or, follow the procedures as outlined in the Operations Manual. Those portable gauges that are USDOT excepted require minimum instruction to include completion of usage logs, operational and emergency procedures.

1.8.6. Periodic refresher training shall be conducted biennially to Authorized Users. This may be conducted by any 40-hour trained AAU or the radiation consultant. Topics include changes in regulations, operating and emergency procedures, particular emphasis items, HAZMAT refresher, or any other topic as determined by the Corporate or facility RSO.

1.9. Worker Commitment

All personnel working with sources of radiation will adhere strictly to policies and procedures applicable to activities involving radiation sources, and will apply ALARA principles and good work practices to minimize their occupational radiation exposures. Time, distance and shielding will be used to keep exposures ALARA. When working with sources of radiation, minimized the time spend near the source, maximize the distance from the source, and make use of available radiation shielding. Workers must report to the RSO any conditions in the workplace that have the potential for causing unnecessary exposures.

2.0 RADIATION SOURCES

2.1. Management of Radiation Sources

2.1.1. Portable Gauges

Sealed sources containing radioactive materials shall not be opened, or removed from their respective source holder. Portable gauges that are not in the physical custody of an Authorized User need to meet the following requirements:

A. The source rod is locked to prevent extension;

B. The gauge is locked in its transportation case; and

C. The transportation case is secured in or on the user's vehicle by chaining and locking the case to the bed of the vehicle, bolting it down, or locking it in a secured shell to prevent removal.

The Emergency Procedure, Emergency Response Information, and Bill of Lading are located in a yellow folder inside the portable Troxler gauge case.

AUs handling the portable gauges are to complete the Usage Log (see Appendix D). This log is maintained by the Facility RSO.

2.1.2 Fixed Gauges

A TEC Radiation Work Permit (RWP) shall be utilized whenever a fixed gauge must be removed for any purpose (See Appendix C). The procedures for the movement of the gauge are required as listed on the RWP. The RWP documents the assessment by the RSO of the gauge prior to work. It identifies the gauge to be moved, locations to and from for the movement, workers, the

2.1.2.1. The following LOCKOUT procedure is to be POSTED:

LOCKOUT/TAGOUT PROCEDURE

Fixed gauge source holder shutters shall be locked in the "off" or closed position whenever:

2.1.2.1.1. Performing any manipulation of a fixed gauge, including the source holder or the detector, which involves physical movement of the source holder or separation from a pipe or vessel including installation, relocation, or storage. When doing a relocation, the RSO or AAU shall perform an exposure assessment as defined and documented on the RWP and assign to maximum amount of time per each individual to make sure they are not exposed to more than 2 mR/hour;

2.1.2.1.2. Individuals are working on or near a gauge or within 12" of a fixed gauge during periods of shutdown. When work is required on or near a gauge, notify all affected personnel that the gauge shutter must be closed, locked-out, and tagged prior to initiating the work.

2.1.2.1.3. An individual enters a vessel in which such a fixed gauge is located. A warning sign will be posted at each entryway to areas where it is possible be exposed to the primary radiation beam from a gauge. Such warning signs will include safety instructions (i.e., "contact the Radiation Safety Officer before Entering Vessel")

2.1.2.2. The facility RSO, an Advanced Authorized User or an Authorized User will verify that the gauge has been effectively locked out. Verification may include a physical inspection of the shutter mechanism and/or ON/OFF indication on the data display that there is a drop in radiation, or performance of a radiation survey (if a survey meter is available). The lock-out/tag-out procedure will be in accordance with the manufacturer's recommendations, using lock-out/tag-out devices meeting the specifications described in this procedure.

2.1.2.3. When locking out a gauge, the on/off or shutter mechanism will be tagged to indicate that the gauge is locked out. If a gauge is incapable of being locked out, a tag-out device must still be used and the condition of the gauge shutter brought to the attention of the RSO.

2.1.3 Leak Testing

Alnor Dewpointer sources do not require leak testing. Fixed cesium-137 gauges require leak testing not to exceed thirty-six (36) months. Portable gauges, such as the Troxler gauge, are to be leak tested annually. The gas chromatograph requires leak testing at intervals not to exceed six (6) months. Results of these tests are kept in units of microcuries.

Only AUs of any of the TEC licenses using an approved leak test kit may take leak test samples. Samples shall be taken by following the directions described on the approved leak test kit. Analysis of the test sample for leakage and contamination must be performed by the manufacturer or by other persons specifically authorized by the Nuclear Regulatory Commission, a licensing state, or an agreement state to perform such services. Prior to mailing the leak test sample shall be surveyed to assure that it does not exceed 0.5 mR/hour at the surface of the envelope (USPS regulations).

If a test reveals the presence of 0.005 microcuries or more of removable contamination, TEC needs to immediately remove the sealed source from use, notify the BRC (407-297-2095) and have it packaged for shipment to the manufacturer. A report is to be filed with the DOH within five (5) days of receiving the test results.

Records of the leak tests will be retained in accordance with the schedule outlined in procedure 2.2. The records will include the following information:

Source manufacturer's name, model and serial number;

Identity of each sealed source radionuclide and its estimated activity, expressed in millicuries.

Measured activity of each leak test sample, in microcuries.

Date the sample was collected; and,

Signature of the RSO or designee.

The AU taking the sample will use all precautions appropriate to make sure that he/she is not in the beam path. Leak tests shall be taken while the shutter is in the closed position.

Leak tests are the analyzed by vendors licensed by the USNRC or an Agreement State to perform leak test services.

Leak test records has be maintained for at least three years. The records shall contain the manufacturer's name, the model number, serial number of the source holder, the radionuclide, estimated radioactivity, the date of the test and signature of the RSO

2.1.4 Inventory

TEC must conduct a physical inventory and inspection at intervals not to exceed six (6) months to account for portable gauges and gas chromatography sources.

The physical inventory interval for fixed gauges at Big Bend and Polk station is annual. These records are maintained for three years from the date of the last inspection. The inventory shall include:2.(see attached Inventory Form, Appendix F).

2.1.4.1. The manufacturer's model number and serial number of each source holder.

2.1.4.2. The identity of each radionuclide and its estimated or original activity.
2.1.4.3. The type and location of each source holder.
2.1.4.4. The date of the inventory.
2.1.4.5. The date of the last leak test.
2.1.4.6. Confirmation that warning signs are posted and clearly visible at each source holder. By using a portable survey meter, confirm that the warning signs are posted at the 2 mR/hour level. If not, it is to be brought to the attention of the RSO.
2.1.4.7. Confirmation that the shutter is operational, if applicable.
2.1.4.8. Notes on the physical appearance of the source holder including environmental conditions in the area. The condition of the gauge will be classified as one of the following:
2.1.4.8.1. **GOOD** means no further comment is necessary.
2.1.4.8.2. **FAIR** means that the gauge is functioning; however, there are concertns, such as, some apparent exterior rust, the shutter is sticking, the metal label is becoming unreadable or potentially compromised. In this case, the person performing the inventory will provide written comments. When received by the SRSO, this necessitates action to remedy the condition before the next inventory period; or,
2.1.4.8.3 **POOR** which means that the functional condition of the gauge is becoming compromised by having excessive rust, extremely problematic shutter, or the metal label is unreadable, for example. When the report is received by the RSO this necessitates action to remedy the condition within 90 days.
NOTE: The above descriptions are examples only. The RSO with the assistance of the site AUs may amend the definitions to standardize this inventory report as much as reasonably achievable. The AU is to evaluate the environmental condition around the gauge and if adverse environmental conditions persist, bring it to the attention of the RSO.When TECO they will include the environmental conditions, and adequate posting of radiation caution signs. In addition, the inventory will include precautions to prevent damage and expeditious modifications needing to be made.

2.1.5 Surveys

Surveys are conducted when performing Lockout/Tagout procedures or any Advanced Services. For all advanced services, the procedures as outlined on the RWP are to be followed with records of the survey maintained for inspection. Surveys shall be conducted using a properly operating survey meter with a range capable of measuring up to 200 mR/hour (64E-5.1314). When relocating a gauge or moving a gauge from storage to use, a survey form or the RWP is used to document the survey performed.

2.1.6. Security

Gauges must be installed in a manner that secures them from unauthorized access or removal. Additional controls (fencing, guards, surveillance and monitoring systems) will be utilized as appropriate to enhance gauge security.

When performing advanced services on fixed gauges, constant surveillance and immediate control is maintained in order to keep unauthorized personnel from having access.

When removing an installed gauge, the source holder is locked closed prior to removal and stored in a locked room or container where it is secured from unauthorized access or removal. The storage area will be posted in accordance with section 1.4.4 of these procedures.

2.1.7. Use of X-ray Producing Machines

TEC personnel operating X-ray producing machines are subject to the conditions of this radiation protection program.

The Radiation Safety Requirements for Analytical X-ray Equipment, as defined in 64E-5, Part VII, paragraph .701, defines the requirements for operating X-ray producing machines. In summary, the regulations state the following:

2.1.7.1 Equipment Requirements

The equipment shall have a safety device preventing entry of any portion of and individual's body into the primary beam. These safety devices shall be checked by the manufacturer upon installation.

2.1.7.2 Warning Devices

The equipment shall have Warning Devices configured to provide indication that the x-ray tube is on. The shutter shall be in the closed position and shall shut down the operation if opened.

2.1.7.3. Labeling

The equipment shall be properly labeled with readily discernable signs indicating the radiation symbol and the words: "CAUTION-HIGH INTENSITY X-RAY BEAM", or words with similar intent; and "CAUTION-THIS EQUIPMENT PRODUCES RADIATION WHEN ENERGIZED", or words with similar intent.

2.1.7.4. Survey

The X-ray equipment is surveyed yearly in its operating status unless the facility can demonstrate compliance with the requirements of 64E.5.312. Upon showing this the equipment need not be resurveyed provided no changes in the equipment has occurred to include, rearrangement of the equipment in another configuration, being reused for other than its intended purpose, major component replacement, or if the equipment needs maintenance or has malfunctioned.

2.1.7.5 Procedures

Personnel are designated as operators after receiving orientation from the RSO. Under no circumstance shall the operations of the X-ray producing device differ from the manufacturer's operational procedures issued upon installation. Any emergency or perceived malfunction shall warrant the operator to cease operation, render the equipment inoperable (unplug) and bring it to the attention of the Corporate RSO immediately.

2.1.7.6 Training

Personnel using x-ray machines shall have training as outlined in 64E-5.704(1). This includes the radiation hazards, radiation warnings, operating procedures, systems of overexposures and proper procedures for reporting overexposures. This training can be performed (approximately 2 hours duration) by a 40-hour trained person or a qualified expert.

2.2 Record Keeping

The following records are kept to the indicated periods:

DOCUMENT	RETENTION INTERVAL	REFERENCE
Chapter 64E-5, F.A.C.	Until termination of License	64E-5.901
Radioactive materials license	Until termination of License	64E-5.901
Rad program, audits, reviews	3 years after records are made	64E-5.335(2)
Training/testing records	Worker's term/ or 5 years (greater)	64E-5.1307(3)
Leak Test records	3 years after record made	64E-5.337
Inventory records	3 years after record made	64E-5.1304
Manu gauge ops manual	As long as gauge on site	64E-5.212
Utilization logs (port. Gauges)	Until disposal is authorized	64E-5.212(2)
Receipt records	Until disposal is authorized	64E-5.103
Transfer/disposal records	Until termination of license	64E-5.340(2)
Survey instrument calibrations	3 years beyond calibration date	64E-5.336(1)
Records of surveys	3 years after records made	64E-5.336(1)

2.3 Fees

General licensed devices are to submit annual fees by July 1 of every year. Specific licenses are subject to fees to be remitted on the anniversary date.

2.4 Reportable Event Notifications

Notification and reporting requirements are found in multiple parts of Chapter 64E-5, Florida Administrative Code (F.A.C.). Additional notifications and reports may be described or repeated in other procedures (i.e., emergency procedures). Also, some notification/reporting requirements overlap. The radiation safety officer (RSO) has the primary responsibility for completing all required notifications and reports. (Refer to duties of the Corporate RSO and Facility RSO). Events necessitating notifications:

2.4.1. Change in RSO. This is to be performed within 30 days of a change in RSO. The new RSO must have the sufficient training to comply with 64E.5.213(7). F.A.C. and .1305(2).

2.4.2. Vacating premises. This is to be performed with 30 days before vacating or relinquishing possession or control of the permanent storage facility listed o in the license.

2.4.3. Change in Ownership. Should a change of ownership or a change in majority of controlling interest occur, a new license application is to be submitted to the BRC within 30 to 45 days. This application will be signed by a certifying official of TEC representing the new license. In addition, a request for termination of the old license will be submitted by the certifying official representing the original license.

2.4.4. Bankruptcy. Upon intent to declare bankruptcy, the BRC will be immediately notified.

2.4.5. License termination. Upon termination of the licensed activities the BRC shall be notified. In addition, the disposition of all the licensed must be documented and submitted to the Department.

2.4.6. Immediate notification required when it is suspected that an individual has received a lose of 25 rem or more. (64E-5.344(1) & (6), F.A.C.

2.4.7. 24-hour notification needs to be made to the DOH in the case of stolen or lost radioactive materials, and the intent for the disposal of radioactive materials.

2.4.8. 24-hour notification required with the discovery of an event involving loss of control of a radiation source and/or cause a dose in excess of 5 rem. (64E-5,344*2(& (7), F.A.C.

2.4.9. 24-hour notification required for: An event in which equipment is disabled or fails to function as designed and is required to prevent exposures; and unplanned fire or explosion damaging radioactive material or the device container of equipment containing radioactive materials.

2.4.10. Information required for immediate / 24-hour notification includes:

The caller's name and call back phone number

A description of the event, including date and time;

The exact location of the event;

The radioisotopes involved with the activities and chemical/physical forms; and

Any personnel radiation exposure data available.

2.5 Emergency Procedures

In the event of a stolen, lost or missing gauge, immediately notify the facility Radiation Safety Officer, the Corporate RSO who in turn will notify the State DOH. The following procedure is to be implemented in the event of physical damage to a gauge:

2.5.1 Evaluate the situation to determine if any individuals may have been exposed to radiation. If individuals are suspected to be contaminated, care for life threatening injuries first, then notify emergency personnel and the hospital staff about possible radioactive materials contamination;

2.5.2 Secure the area around the gauge using a radius of at least 15 feet from its location. Maintain direct surveillance to prevent unauthorized entries;

2.5.3. As soon as possible, notify the facility RSO, the Corporate RSO who will notify the State of FL DOH; and, refer to notification and reporting procedures for additional instructions;

2.5.4. If proper instrumentation is not available, wait for technical assistance prior to approaching or moving the gauge so that the extent of damage to the source holder can be determined. A survey meter is used to determine the presence of higher than expected radiation levels in the area; and appropriate precautions and equipment may be required to perform any response activities under the supervision of the RSO. If any equipment is involved in the emergency, isolate the equipment until it can be surveyed for possible contamination.

2.5.5. Arrange for a radiation survey to be conducted as soon as possible by a qualified person using appropriate radiation detection instrumentation. To accurately assess the radiation danger, it is essential that the person performing the survey be competent in the use of the survey meter.

2.5.6. If radiation levels permit it, perform a leak test on the source holder to determine if the sealed source is leaking. If a leak test kit is unavailable, use Q-tip or other similar materials to perform

the test, and place the Q-tip or other wiping materials in a zip-loc bag and survey before sending it for expedited analysis.

2.5.7. In the event of a fire or explosion emergency, local authorities are to be contacted by the facility's first responder. Notification to the DOH and the local authorities is to be performed by the Corporate RSO.

TELEPHONE NUMBERS	
Rosa Webster	Office: (813) 630-7336 Mobile: (813) 310-9185
Department of Health (DOH):	(407) 297-2095

2.5.8. In the event of a radioactive material incident from a TEC facility in the event of a building fire, gauge fire, explosion, theft, or a release threatening human health or the environment notification is required to the DOH.

EMERGENCY RESPONSE INFORMATION

IN CASE OF AN ACCIDENT IMMEDIATELY CONTACT YOUR FACILITY RADIATION SAFETY OFFICER (RSO) AND THE TAMPA ELECTRIC COMPANY RSO

TECO CORPORATION: CORPORATE RSO: ROSA WEBSTER Business: (813) 630-7336 Cell: (813) 310-9185 Home:		
Local Authority: 911	**Bureau of Radiation Control:** (407) 297-2095	**Troxler Electronic Lab:** (919) 839-2676

LABORATORY AFFAIRS	PORTABLE & FIXED GAUGES
RSO: PEGGY PENNER Cell: (813) 351 9960 Telephone (813) 630 7490 Home:	BIG BEND STATION RSO: GARY GARBELMAN: (813) 268-3619 Cell: (813) 731 4291 Telephone: (813) 630-7063 or (813) 228-1111 ext. 48-363 Home:

TECO
TAMPA ELECTRIC
AN EMERA COMPANY

FIXED GAUGES	OTHER
POLK POWER STATION RSO: BEN WILLOUGHBY Telephone:(863) 428 5996 Mobile: (813) 918 3262	Cell: Home:

POTENTIAL HAZARDS AND EMERGENCY PROCEDURES

SHIPPING NAME AND HAZARD CLASS *RQ, RADIOACTIVE MATERIAL, SPECIAL FORM, N.O.S. UN 2974, CLASS 7, TYPE A PACKAGE*
1. External Radiation Hazard from Unshielded Source 2. Low-level Radioactive Material; Little Radiation Hazard from Intact Gauge 3. Material in Special Form Are Not Expected to Cause Contamination in Accidents 4. Potential Internal Radiation Hazard from Inhalation, Ingestion, or Breaks in Skin, Only If Special Form Capsule Is Breached.
RISKS OF FIRE OR EXPLOSION
1. No Risk of Fire or Explosion 2. Radioactivity Does Not Change Flammability or Other Properties of the Materials
IMMEDIATE PRECAUTIONS
1. Isolate Hazard Area to Within a 10-15 Foot Radius of the Gauge and Restrict Access. 2. Emergency Response Actions May Be Performed Prior to Any Measurement of Radiation; Limit Entry to Shortest Time Possible. 3. Notify Local Authorities and Radiation Control Authority on Accident Conditions. 4. Detain Uninjured Persons, Isolate Equipment with Suspected Contamination and Delay Cleanup until Instruction from Radiation Control Authority.
IMMEDIATE METHODS FOR HANDLING SMALL FIRES
1. Do Not Move Damaged Containers; Move Undamaged Containers out of Fire Zone. 2. Small Fires: Dry Chemical, CO_2, Water Spray or Regular Foam. 3. Large Fires: Water Spray, Fog (Flooding Amount)
INITIAL METHODS FOR HANDLING LEAKS IN THE ABSENCE OF FIRE
1. Do Not Touch Damaged or Exposed Containers 2. Damage to Outer Container May Not Affect Primary Inner Container 3. Special Form Capsules Are Not Expected to Leak as a Result of an Accident or Fire.
PRELIMINARY FIRST AID MEASURES
1. Use First Aid Treatment According to the Nature of the Injury. 2. Advise Medical Personnel That Victim May Be Contaminated with Low-level Radioactive Material. 3. Except for the Injured, Detain Persons Exposed to Radioactive Material until Arrival or Instruction of Radiation Control Authority.

APPENDIX A
GLOSSARY

ACTIVITY is the rate of disintegration (transformation) or decay of radioactive material. The units of activity are the curie (Ci) and the becquerel (Bq).

ADVANCED AUTHORIZED USER (AAU) is an individual qualified to conduct installation, relocation, removal of the source holder, not involving the installation, replacement or disposal of the sealed sources containing radioactive materials used in the devices. The persons performing these functions complete a 40–hour training course authorized by the DOH.

ALARA (acronym for "as low as reasonably achievable") means making every reasonable effort to maintain exposures to radiation as far below the dose limits as is practical, consistent with the purpose for which the licensed activity is undertaken, taking into account the state of technology, the economics of improvements in relations to state of technology, the economics of improvements in relation to benefits to the public health and safety, and other social and socioeconomic considerations, and in relation to utilization of nuclear energy and license materials in the public interest.

ANCILLARY WORKER is a person who helps with the permitted activity outside the radiation area boundary (e.g., crane or hoisting operator, welder or helper) shall be authorized by the AAU and be given an orientation as the radiation hazards commensurate with the job. The auxillary personnel cannot use a survey meter or make any decisions regarding dose levels. The ancillary worker's exposure rate is limited to 2 mR/hour and an annual whole body dose of 100 mrem.

AUTHORIZED USER (AU) is an individual qualified to perform general tasks involving a gauge that presents minimal health and safety risks. They have 8 hours of training.

BACKGROUND RADIATION means radiation from cosmic sources, naturally occurring radioactive material, and fallout from previous nuclear tests.

DECLARED PREGNANT WOMAN means a woman who has voluntarily informed TEC, in writing, of her pregnancy and the estimated date of conception.

DOSE is a generic term that means absorbed dose, dose equivalent, effect dose equivalent, committed dose equivalent, committed effective dose equivalent, or total effective dose equivalent (TEDE). For TEC if means the TEDE.

EXPOSURE means being exposed to ionizing radiation from X-ray machines or radioactive materials.

INDIVIDUAL MONITORING DEVICE means devices designed to be worn by a single individual for the assessment of dose equivalent such as film badges or Optically Stimulated Luminescent Dosimeters (OSLDs).

INSTALLATION means the placement of a device containing radioactive material onto a pipe, tank or other industrial machinery specifically compatible with the intended use as recommended by the manufacturer of the device.

LICENSED MATERIALS mean all the radioactive materials authorized to be received, handled and stored at the TECO site under a Specific or General License.

MEMBER OF THE PUBLIC (MOP) means any individual except when that individual is receiving an occupational dose. The annual limit for the MOP is 100 mrem.

OCCUPATIONAL DOSE means the dose received by an individual in the course of employment in which the individual's assigned duties involve exposure to radiation or to radioactive materials from licensed sources. Occupational dose does not include doses received from background radiation, from any medical procedure, from exposure to individuals administered radioactive materials and release from the medical facility, or as a member of the public (MOP).

RADIATION WORK PERMIT (RWP) is a form to use in the event gauges are to be installed, relocated, placed into storage, or removed from storage and installed. A RWP is written documentation of procedures and approval that authorizes personnel to do specified work or to enter an area that requires special conditions and precautions to minimize a potential radiological hazard. The RWP must be initiated by an AAU. It is the basis for the documentation for worker exposures.

RELOCATION means the movement of a device containing radioactive materials from one location within a facilty to another, or between facilities. The device is to be moved intact and reinstalled at another location suitable for the intended use of the device or placed into storage.

REPAIR means the repair of the detector mechanism electronics or any other repair that cannot be accomplished in place, as some repair

activities may require the removal of the source holder, and the subsequent reinstallation.

SURVEY means an evaluation of the radiological conditions and potential hazards incident to the production, use, transfer, release, disposal, or presence of radioactive materials or other sources of radiation, such as X-rays.

APPENDIX B

RADIOGRAPHY INFORMATION CHECK SHEET

ENERGY SUPPLY
RADIOGRAPHY INFORMATION CHECK SHEET

To Be Completed By TEC Supervisory Personnel In Charge Of This Activity:

Date of Radiography: _____
Location of Planned Radiography: _____
Anticipated Radiography Start Time: _____
Anticipated Duration of Radiography: _____
S.P.O./Designee on Duty at Time of Radiography: _____
Radiography Contractor: _____
TEC Supervisory Personnel In Charge Of This Activity: _____

S.P.O./Designee Plant Notification List: To Be Completed Prior To Announcement Of X-Ray Activities

ANTICIPATED PLANT COVERAGE DURING RADIOGRAPHY:	NAME	NOTIFIED
Mechanical Maintenance Supervisor(s) or Working Foreman:		
Location RSO (Voicemail Adequate):		
I & C Supervisor(s) or Lead Craftsmen:		
Water & Fuels Supervisor or Lead Craftsman:		
Electric Shop Supervisor or Lead Craftsman:		
Engineering Supervisor:		
Maintenance Planning Staff:		
Power Plan Construction Supervisor:		

The Radiography Contractor Shall:

1. Notify S.P.O./Designee upon arrival on site.
2. Document number of radioactive sources responsible for on-site. # of sources _____ Signature: _____
3. Rope off the area with magenta and yellow warning tape.
4. Post signs indicating x-ray activities are in progress. Signs should be sufficient to keep everyone out and visible from all area entry points.
5. Notify the S.P.O. or Designee when you are prepared to commence with testing. The S.P.O./Designee shall, upon notification, announce the impending x-ray activity over the PA system warning everyone to stay clear of the area.
6. Prior to leaving site, document that all radioactive sources are accounted for: # of sources _____ Signature: _____

UPON COMPLETION, RETURN COMPLETED FORM TO LOCATION RADIATION SAFETY OFFICER.

LOCATION RADIATION SAFETY OFFICER: _____
DATE REVIEWED: _____

APPENDIX B1

RADIOGRAPHY INFORMATION CHECK SHEET- POLK

TAMPA ELECTRIC COMPANY
ENERGY SUPPLY – Polk Power Station
RADIOGRAPHY (X-Ray) INFORMATION CHECK SHEET

To be completed by Person leading this activity:

DATE of Radiographic activity: _____

RADIOGRAPHY CONTRACTOR: _____

LOCATION OF PLANNED RADIOGRAPHY: _____

ANTICIPATED RADIOGRAPHY START TIME: _____

ANTICIPATED DURATION OF RADIOGRAPHY: _____

Team Leader ON DUTY AT TIME OF RADIOGRAPHY: _____

Print name of Person leading this activity: _____

Plant Notification List: The individual leading the Radiography Contractor must personally notify all personnel who will are expected to be in the plant during the activity. This notification will be through a personal notification (by phone or in-person, voicemail not acceptable) of their supervisory/management personnel and is to be completed prior to announcement of x-ray activities.

POSITION	NAME of person notified *(not a signature)*	NOTIFIED BY
OUTAGE COORDINATOR (outage only)		
OUTAGE COORDINATOR (outage only)		
OUTAGE COORDINATOR (outage only)		
OUTAGE COORDINATOR (outage only)		
OUTAGE COORDINATOR (outage only)		
MAINTENANCE COORDINATOR ON-SHIFT		
TEAM LEADER ON-SHIFT		
TEAM LEADER ON-SHIFT		
CONTRACTOR SUPERVISOR OR PLANNER		
MAINTENANCE MANAGER		
OPERATIONS SUPERINTENDENT		
ENGINEERING TEAM LEADER		
LOCATION RSO (voicemail acceptable)		

Upon completion of notifications post check-sheet in Team Leader's office.

Radiography Procedure:

1. TEC person leading work will ensure Radiography Contractor is aware of and follows this procedure.
2. Radiography Contractor will notify Team Leader upon arrival on site.
3. Prior to commencing radiography the Radiography Contractor will rope off the area with magenta and yellow warning tape and post signs indicating x-ray activities are in progress. Signs should be sufficient to keep everyone out and visible from all area entry points. Radiographer will document the number of radioactive sources they are responsible for on site:

   # of sources _____ Radiographer Contractor Signature: _____

4. Radiography Contractor will notify the Team Leader when prepared to commence with testing. The Team Leader shall, upon notification, announce the impending x-ray activity over the PA system warning everyone to stay clear of the area.
5. Prior to leaving site, the Radiography Contractor will document here that the number of radioactive sources they are responsible for on site have all been accounted for.

   # of sources _____ Radiographer Contractor Signature: _____

Upon completion, Team Leader forwards completed form to Location Radiation Safety Officer.

Location Radiation Safety Officer: _____ Date Reviewed: _____

Revised 04/04

APPENDIX C

RADIATION WORK PERMIT FOR FIXED GAUGES

RADIATION WORK PERMIT

For Fixed Gauges

Date: _____ Time: _____ Permit Expires: _____

Work to Be Done: _____

Old gauge location: _____ Serial Number: _____

New gauge location: _____ Element/mass #: _____

Radioactivity: _____ mCi / Gauge manufacturer/model no._____

Names of those involved in work: _____

Leader: _____

PRECAUTIONS:

YES	N/A		
☐	☐	1.	Shutter shall be closed and locked by RSO or designated Authorized User whenever: a. the device is physically moved; b. working on or within 12" of gauge c. entrance into a vessel in which a gauge is located

IF FIXED GAUGE IS TO BE MOVED:

☐	☐	2.	An Advanced Authorized User shall supervise physical movement of fixed gauge.
☐	☐	3.	Area surveyed with a calibrated meter. Meter# _____ Cal. Date _____ Maximum Radiation Measured at: Gauge Surface _____ mR/HR 1 Ft. Distance _____ mR/HR
☐	☐	4.	Survey results must be used to calculate exposure limits. Based on a maximum allowable exposure of 2 mR/HR, stay time restriction required for: Contact with gauge: _____ Min/Hr 1 Foot from gauge: _____ Min/Hr (example: if a gauge measures 12 mR/HR at surface and 1 mR/HR at 1 ft. distance, contact with the gauge must be limited to 10 min/hr. There would be no limit for work 1 foot or greater from the gauge.)
☐	☐	5.	Safe job procedures and exposure limits have been discussed with all personnel involved with the work. Personnel advised that gauges are very heavy. Refer to manufacture for specific weight.
☐	☐	6.	Any gauge removed from its installed location must be stored in a secure location pending reinstallation.
☐	☐	7.	Gauges in storage shall be identified with radiation hazard signs.
☐	☐	8.	Gauges in storage shall have shutters closed and locked.

SIGNATURES:

Facility RSO or Advanced Authorized User_____ Date:_____

FINAL CHECK:

YES	N/A	
☐		Unlock the shutter and return the gauge to service.
☐		New or relocated gauge is surveyed upon installation: Max. field measured @ gauge surface (_____) mR/hour Max. field measured @ gauge 1 foot (_____)mR/hour
☐	☐	New or re-installed gauges must be wipe-tested within 6 months and surveyed immediately upon installation
☐		Radiation signs are installed at the 2 mR/hour level and clearly visible.
☐		The gauge is ready for service.

☐ Forward completed form to facility RSO to record employee doses in site log.

Advanced Authorized User:_____ Date:_____

RSO Signature:_____Date Reviewed: _____

DOSE REPORT (To Be Calculated By RSO only)

	Personnel		Task	Fraction of hour in 6 minute increments for each task	X	Exposure rate in mR/hr at surface	PLUS	Fraction of hour in 6 minute increments for each task	X	Exposure rate in mR/hr at one foot		EQUALS	Total dose (in mrem) for RWP

APPENDIX D

RADIOACTIVE MATERIALS USAGE LOG - PORTABLE GAUGES

APPENDIX D

RADIOACTIVE MATERIALS - USAGE LOG
PORTABLE GAUGES

Facility: _____

Source: _____

Source Description: _____

Device Model No. / Serial No.: _____

DATE	GAUGE USER	LOCATION(s) WHERE GAUGE WAS USED	FACILITY RSO

APPENDIX E

RADIOACTIVE MATERIALS MANAGEMENT AUDIT CHECKLIST ALARA PROGRAM

APPENDIX E

RADIOACTIVE MATERIALS MANAGEMENT AUDIT CHECKLIST
ALARA PROGRAM

FACILITY: _____ **DATE:** _____

COMPLETED BY: _____ **SIGNATURE:** _____

PLEASE CHECK CORRECT ANSWER

				On Hand?
1.	Facility Radioactive Materials License Number:	Yes ☐	No ☐	GL ☐
2.	Is the license correspondence available?	Yes ☐	No ☐	GL ☐
3.	Are copies of the following available at the facility?	Yes ☐	No ☐	
	• Chapter 64E-5, F.A.C.?	Yes ☐	No ☐	
	• Operating & emergency procedures for portable & fixed gauges?	Yes ☐	No ☐	
4.	Has the facility received any radioactive sources in the last year? If yes, attach receipt.	Yes ☐	No ☐	GL ☐
5.	Has each portable gauge been tested for leakage and/or contamination at intervals not to exceed twelve (12) months, Gas Chromatograph at intervals not to exceed six (6) months; and fixed gauges at intervals not to exceed 36 months? If not, state discrepancy.	Yes ☐	No ☐	N/A ☐
	_____			
	_____			
	a. Has the RSO signed the leak test results page?	Yes ☐	No ☐	N/A ☐
	b. Do any of the tests reveal contamination of 0.005 microcuries or more?	Yes ☐	No ☐	N/A ☐
6.	Leak Test kit supplier _____			
7.	Fixed gauge installation, relocation, maintenance, repair or initial radiation survey was performed in last 12 months?	Yes ☐	No ☐	N/A ☐
	If yes, RWP completed for each?	Yes ☐	No ☐	N/A ☐
8.	Is an inventory of all portable gauges located at the facility performed within six (6) months interval?	Yes ☐	No ☐	N/A ☐

Dates of inventories: _____

9.	Is an inventory of all fixed gauges located at the facility performed within 12 months interval?	Yes ☐	No ☐	N/A ☐

Dates of inventories: _____

10. How is the portable gauge transported?

_____

_____

_____

WALK THROUGH

11. Are the following forms posted?
    - Notices of violation? Yes ☐ No ☐ N/A ☐
    - Orders issued and responses to violations? Yes ☐ No ☐ N/A ☐
    - Form 1081? Yes ☐ No ☐
    - Does Form 1081 include a location where the operation documents can be examined? Yes ☐ No ☐
    - Yellow emergency sheet? Yes ☐ No ☐
    - Tampa Electric Company Emergency Response document? Yes ☐ No ☐
    - Facility Lock Out Procedures for fixed gauges? Yes ☐ No ☐ N/A ☐

12. Are the following documents attached to the portable gauge case?
    - Emergency Response Information (ERI) document? Yes ☐ No ☐
    - Bill of Lading? Yes ☐ No ☐
    - Tampa Electric Company Emergency Response document? Yes ☐ No ☐

13. Does the portable gauge case have the correct marking and labels? Yes ☐ No ☐

14. Are the gauges marked with legible "Caution Radiation" signs? Yes ☐ No ☐

15. Are the facility lock-out procedures posted for fixed gauges? Yes ☐ No ☐

Comments: _____

_____

_____

_____

Corporate RSO: _____

_____

APPENDIX F

STATION RADIOACTIVE MATERIALS INVENTORY

APPENDIX F
RADIOACTIVE MATERIALS INVENTORY
BIG BEND STATION

SERIAL NUMBER	LOCATION	DATE RECEIVED	SOURCE	SOURCE HOLDER & MANUFACTURER	ACTIVITY AS RECEIVED mCi	ACTIVITY CURRENT (ESTIMATED) mCi	PHYSICAL CONDITION	INVENTORY DATE	LAST WIPE CHECK	INSPECTOR INITIALS
9919GG	FGD A1 MILL SLURRY PP	6/00	CS-137	SH-F1 - OHMART	20	17.43	Good	04/28/06	04/29/05	GLG
5796GK	FGD A2 MILL SLURRY PP	5/98	CS-137	SH-F1 - OHMART	20	16.64	Good	04/28/06	04/29/05	GLG
0750GK	FGD B2 MILL SLURRY PP	6/00	CS-137	SH-F1 - OHMART	20	17.43	Good	04/28/06	04/29/05	GLG
5799GK	FGD B1 MILL SLURRY PP	5/98	CS-137	SH-F1 - OHMART	20	16.64	Good	04/28/06	04/29/05	GLG
7779GK	FGD C1 MILL SLURRY PP	6/00	CS-137	SH-F1 - OHMART	20	17.43	Good	04/28/06	04/29/05	GLG
7666GK	FGD C2 MILL SLURRY PP	5/98	CS-137	SH-F1 - OHMART	15	12.48	Good	04/28/06	04/29/05	GLG
8545GK	BB1&2 ABSORBER-REAGENT	6/00	CS-137	SH-F1 - OHMART	20	17.43	Good	04/28/06	04/29/05	GLG
B3214	BB1&2 ABSORBER-BLEED	8/99	CS-137	5201 - TEX. INS.	50	42.57	Good	04/28/06	04/29/05	GLG
78-17	CONDENSATE POLISHER	01/04	AM241BE	3430 - TROXLER	40	39.87	Good	04/28/06	12/17/05	GLG
77-1875	CONDENSATE POLISHER	01/04	CS-137	3430 - TROXLER	8	7.64	Good	04/28/06	12/17/05	GLG

MANUFACTURER	DIST. MODEL/SERIAL NUMBER	SOURCE SERIAL NUMBER	LOCATION	DATE RECEIVED	ACTIVITY mCi	PHYSICAL CONDITION	INVENTORY DATE	INSPECTORS INITIALS
ALNOR INSTRUMENT COMPANY	Niton Xlt 898Q	6608	CONDENSATE POLISHER CONTROL PANEL ROOM	8/04	N/A	**Registered as X-ray device**	**Renewed 1/25/06**	

ENVIRONMENTAL AFFAIRS LAB

Date: _____

Inspector: _____ Signature: _____
(Please Print)

ELECTRON CAPTURE DETECTOR/NICKEL 63								
MANUFACTURER	INSTRUMENT MODEL	SERIAL NUMBER	LOCATION	DATE RECEIVED	ACTIVITY mCi	PHYSICAL CONDITION	INVENTORY DATE	INSPECTORS INITIALS
Perkin Elmer	PEASXL	610N1061501/3550	WATER AREA/LAB SERVICES	8/6/01	15		Registered as GL device	

APPENDIX F
RADIOACTIVE MATERIALS INVENTORY
POLK POWER PLANT

Date: _____

Inspector: _____ Signature: _____

Gauge Manufacturer: Texas Instruments (fixed gauges) Ce 137
Environmental Technologies Group, Inc. (Ion Mobility Analyzer) Ni 63
Physical Inspection Comments: _____

INSTRUMENT MODEL/SERIAL NUMBER	SOURCE SERIAL NUMBER	LOCATION	DATE RECEIVED	ACTIVITY mCi	PHYSICAL CONDITION (Shutters, Caution Signs)	INVENTORY DATE	INSPECTOR'S INITIALS
5201	B2689	GEHO Pump	7/28/96	50			
5200	B2914	Coal Bin Bottom North Side	7/28/96	100			
5200	B2915	Coal Bin Middle North Side	7/28/96	100			
5200	B2916	Coal Bin Top North Side	7/28/96	100			
5200	B2917	Coal Bin Bottom South Side	7/28/96	100			
5200	B2918	Coal Bin Middle South Side	7/28/96	100			
5200	B2919	Coal Bin Top South Side	7/28/96	100			
5201	B3058	Mill Discharge	8/98	50			

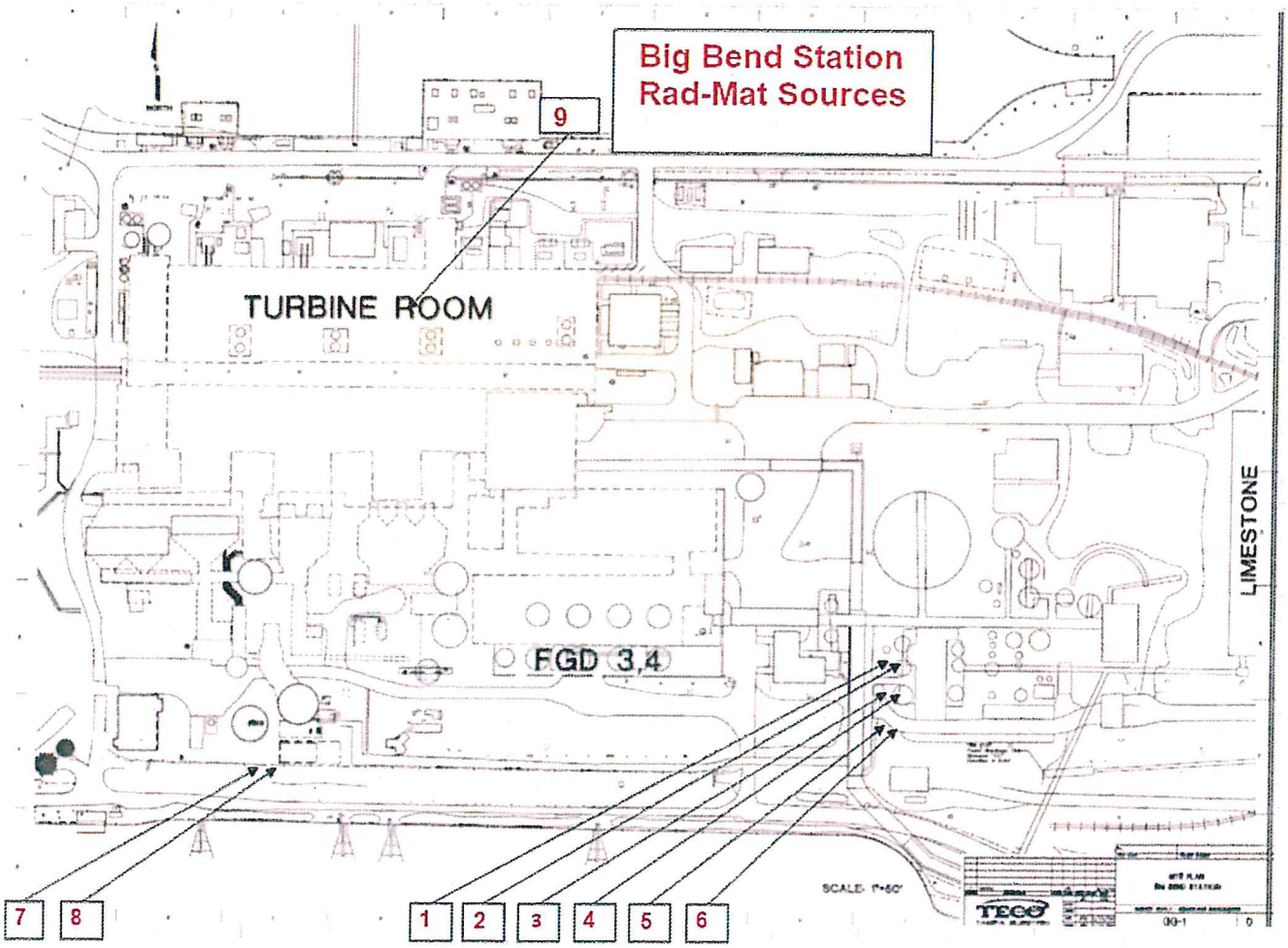
5201	B3059	Mill Discharge	8/98	50			

APPENDIX G

FLOOR PLANS

BIG BEND STATION
Rad Mat Sources
Troxler Gauge Location

POLK POWER PLANT
Radiation Devices

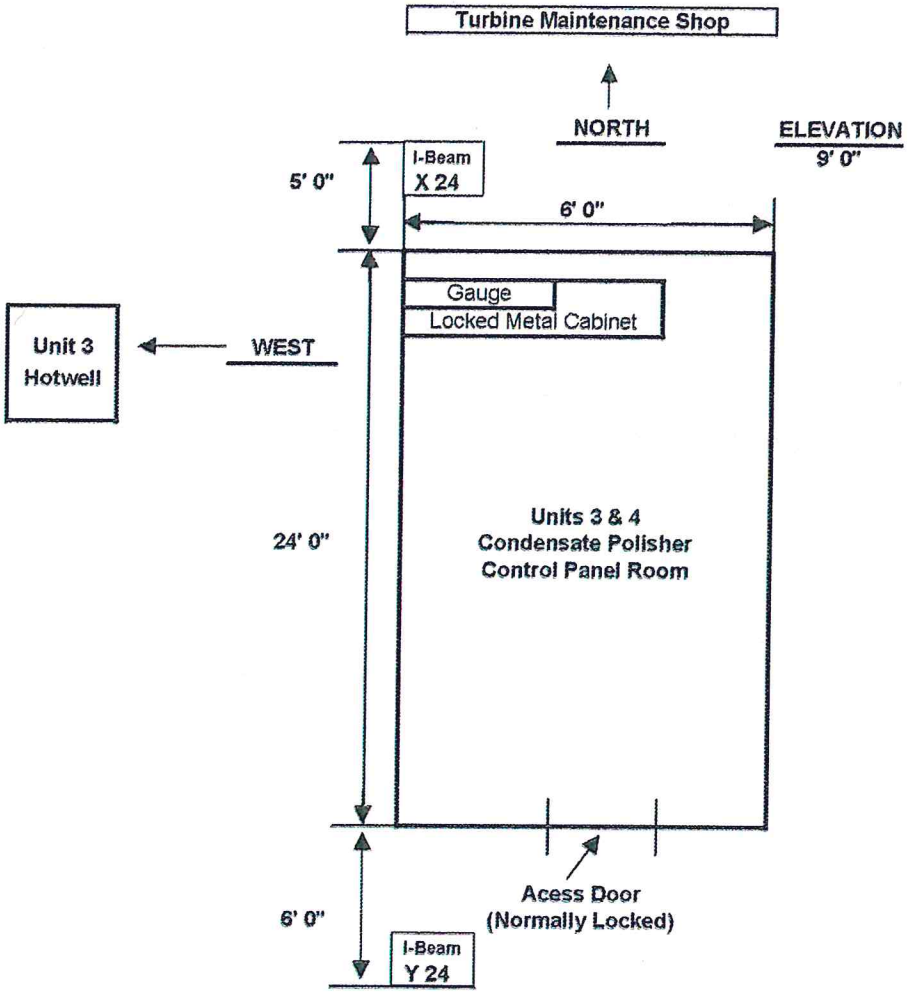

Big Bend Station
Rad-Mat Sources
9
TURBINE ROOM
FGD 3,4
LIMESTONE
7
8
1
2
3
4
5
6

TAMPA ELECTRIC COMPANY

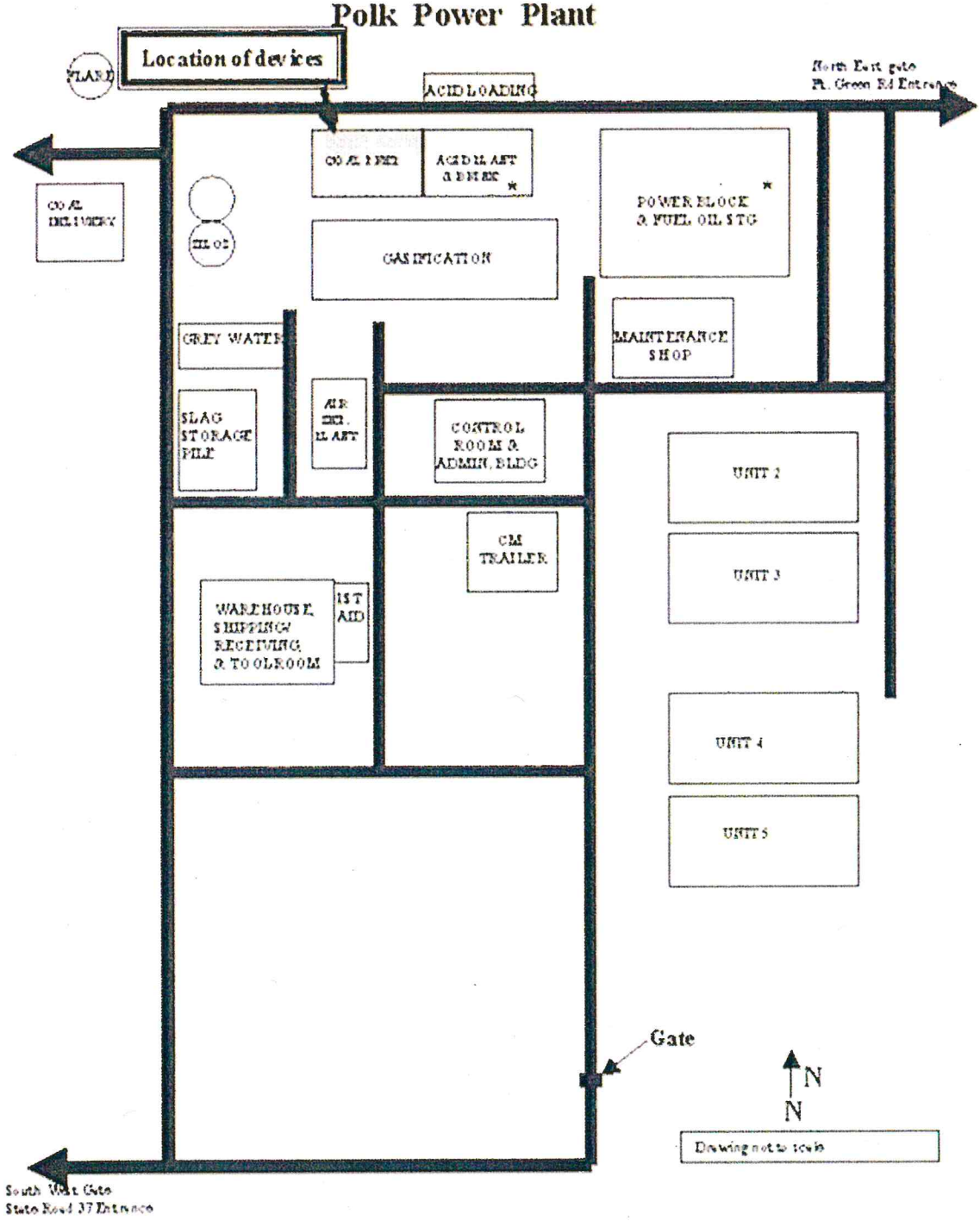
BIG BEND STATION
RAD-MAT SITE MAP LEGEND

	SERIAL NUMBER	LOCATION
1	9919GG	FGD A1 MILL SLURRY PP
2	5796GK	FGD A2 MILL SLURRY PP
3	0750GK	FGD B2 MILL SLURRY PP
4	5799GK	FGD B1 MILL SLURRY PP
5	7779GK	FGD C1 MILL SLURRY PP
6	7666GK	FGD C2 MILL SLURRY PP
7	8545GK	BB1&2 ABSORBER-REAGENT
8	B3214	BB1&2 ABSORBER-BLEED
9	TROXLER	
	34824	CONDENSATE POLISHER

Tampa Electric Co. - Big Bend Station
Location of Portable Troxler Gauge
S/N 34824



RADIATION DEVICES
Polk Power Plant



APPENDIX H
NOTICE TO EMPLOYEES

FLORIDA DEPARTMENT OF HEALTH
NOTICE TO EMPLOYEES

STANDARDS FOR PROTECTION AGAINST RADIATION; NOTICES, INSTRUCTIONS AND REPORTS TO WORKERS; INSPECTIONS

POSTING REQUIREMENT

THIS NOTICE MUST BE POSTED IN PLACES THAT PERMIT EMPLOYEES IN A RESTRICTED AREA TO SEE A COPY ON THE WAY TO OR FROM THEIR PLACE OF EMPLOYMENT.

YOUR EMPLOYER IS REQUIRED TO:

- Post or provide you a copy of the Department of Health rules and operating procedures that apply to your work and explain them to you.
- Apply the rules to work involving radiation sources.
- Post or provide you any Notice of Violation involving radiological working conditions, proposed civil penalties, and orders.

YOU ARE REQUIRED TO:

- Become familiar with the rules and the operating procedures that apply to your work.
- Observe the requirements to protect yourself and your co-workers.

WHAT IS IN THESE RULES:

- Limits on exposure to radiation and radioactive material in restricted and unrestricted areas
- Actions to take after accidental exposure
- Personnel monitoring, surveys, and equipment
- Caution signs, labels, and safety interlocks
- Exposure records and reports
- Options for workers about Department of Health inspections
- Related matters

REPORTS ON RADIATION EXPOSURE

Your employer must give you a written report if you receive an exposure above the limits in the rules or in the license. The maximum limits for exposure to employees are in Part III of the rules. However, your employer should keep your radiation exposure as low as reasonably achievable.

If you work where personnel monitoring is required:

- Your employer must give you a written annual report of your radiation exposures.
- Your employer must give you a written report of your radiation exposures when you terminate employment.

INSPECTIONS

Representatives of the Department of Health inspect all licensed and registered activities. Any worker or worker representative who believes that there is a violation of Chapter 404, Florida Statutes; Chapter 64E-5, Florida Administrative Code; or the terms of the employer's license or registration can request an inspection by contacting the Bureau of Radiation Control, Bin C21, 4052 Bald Cypress Way, Tallahassee, FL 32399-1741 (850) 245-4266. The request must state specific reasons for the inspection. During inspections, Department of Health inspectors can confer privately with workers and any worker can bring to the attention of the inspectors any past or present condition that they believe contributed to or caused any violation.

Copies of Chapter 64E-5, F.A.C., the license or registration, operating procedures, any notice of violation about working conditions, penalty orders issued, and responses can be examined at:

Notice to Employees – 3/01