UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

In the Matter of FLORIDA POWER & LIGHT COMPANY (Turkey Point Nuclear Generating Unit Nos. 3 and 4)	))))))	Docket Nos. 50-250-SP 50-251-SP (Proposed Amendments to Facility Operating License to Permit Steam Generator Repairs)

AFFIDAVIT OF HARVEY F. STORY ON CONTENTION 2

My name is Harvey F. Story. My business address is 6040 S.W. 82 Avenue, Miami, Florida 33143. I am a certified Health Physicist and President of Nuclear Power Resources, Inc. A statement of my professional background and qualifications is attached to this testimony.

I was employed by Florida Power & Light Company (FPL) from September, 1970 until March 31, 1981. During the last five years, I was the Corporate Health Physicist. I am familiar with the programs and procedures to be followed by FPL during the repairs in order to maintain occupational radiation exposures as low as is reasonably achievable and the measures which will be taken to limit individual exposures within regulatory limits.

This affidavit addresses Contention 2 which states:

A. The programs and procedures proposed to be followed by the Licensee in making the steam generator repairs demonstrate that it will not make every reasonable effort to maintain occupational radiation exposures as low as is reasonably achievable (ALARA) within the meaning of 10 CFR Part 20 or that it will not comply with 10 CFR 20.101, in that the Licensee intends to use transient workers with unknown radiation exposure histories.

B. A sufficient work force, both skilled and unskilled cannot be obtained to perform the repairs without violating the limits on individual exposures contained in 10 CFR 20.101.

This affidavit is divided into two parts. The first part demonstrates that FPL's proposed program for controlling occupational exposures to radiation satisfies the ALARA principle. The second part demonstrates that FPL's procedures for transient workers complies with 10 CFR Part 20.

I. Maintaining Exposures ALARA

10 CFR 20.1(c) requires licensees to make every reasonable effort to maintain radiation exposures as low as is reasonably achievable (ALARA).

FPL is committed to the ALARA principle. Independently of the repairs, FPL has established an extensive Health Physics Program. The Florida Power & Light Company Health Physics Manual contains the radiation protection policies of the Florida Power & Light Company Health Physics Program. The manual has been prepared by the Power Resources Department Nuclear Staff of FPL to describe the requirements and procedures for implementing a program for maintaining occupational exposure to ionizing radiation as low as is reasonably achievable. The plant staffs, with support and review by the Corporate Health Physics Staff, have written over 50 detailed procedures covering all aspects of the program. This Health Physics Program will be utilized during the repair.

The bases for the Health Physics Manual are the requirements and recommendations set forth by the following documents and/or agencies:

Title 10, Code of Federal Regulations (10 CFR Parts 19 & 20)

Chapter 10D-56, Control of Radiation Hazards, State of Florida

National Council on Radiation Protection and Measurements (NCRP)

International Commission on Radiation Protection (ICRP)

International Commission on Radiation Units and Measurements (ICRU)

International Atomic Energy Agency (IAEA)

NRC Regulatory Guides 8.8 and 8.10

It should be stressed that the Steam Generator Repair Project (SGRP) does not involve any new concepts or problems from the standpoint of health physics. Additionally, it should be noted that the majority of the repair operations will occur in relatively low radiation areas, (10-50 mrem/hr). However, the following represent the principal work operations which will require some people to work in high radiation areas ($\geq$100 mrem/hr whole-body dose rate):

1) Removal of the existing steam generator manway covers, installation of the reactor coolant pipe nozzle inflatable seals, and installation of the temporary manway covers, all of which are required prior to decontamination of the steam generator channel heads.

2) Cutting of the steam generator in the transition cone area and fit-up of the tube bundle cover plates for the existing steam generators.

3) Cutting and welding of the existing steam generator at the

channel head area just below the tubesheet.

4). Fit-up of the existing steam generator lower assembly tubesheet cover plates.

Although the dose rates estimated for the above work operations are not insignificant, many FPL projects, such as replacing reactor coolant pump seals, have required work in areas of high radiation fields, and have been successfully performed frequently in the past.

In short, FPL's normal Health Physics Program will be adequate for the repairs. Experience gained in past projects has been and will be used to ensure that all necessary precautions will be taken during the repairs to guarantee that the purpose of ALARA is fully satisfied.

FPL's Health Physics Program, together with dose-reduction measures planned for the repairs, is described in detail below.

A. Management Commitment

1. Current Program

One of the most important aspects of any health physics program is the commitment to the ALARA principle by management. The following is a brief statement of the corporate radiation protection policy, quoted from the Health Physics Manual:

> The operation and maintenance of a nuclear power plant requires that some personnel be exposed to an environment of ionizing radiation. Doses received under limits recommended by the National Commission on Radiation Protection (NCRP) and those adopted by the NRC involve a risk that is small as compared to every day hazards of life. Nevertheless, every effort should be made to reduce the exposure from ionizing radiation to the lowest level that is reasonably achievable.

The organization, practices, and procedures described below reflect the extent of that commitment.

2. Steam Generator Repair Program

FPL personnel were assigned to the Surry steam generator repair. Persons employed by FPL participated in, observed, and analyzed the Surry Units 1 and 2 steam generator removal and replacement projects. These individuals represented various FPL departments and have provided FPL with valuable information in such areas as Quality Assurance, Construction, Health Physics, Project Management, Engineering, Plant Operations for the Turkey Point steam generator replacement planning and scheduling effort.

FPL Plant Health Physics technicians and supervisors who will be responsible for health physics operations, training and administration at Turkey Point, spent more than a week at the Surry 2 repair. They made observations and received valuable information on such things as logistics of health physics processing and training, dosimetry control, man-rem evaluations, shielding requirements and decontaminating operations. Health Physics plant technicians, supervisors and Health Physics staff personnel also spent about a week at the Surry 1 repair project.

Another example of FPL Management's commitment to the ALARA program is the use of an on-site mini-computer system to provide real-time accumulation of personnel exposures for more accurate and timely analysis and evaluation of man-rem data during the steam generator project.

3. Conclusion

In short, FPL Management is committed to the extensive Health Physics Program that is designed to meet the corporate radiation protection policy and to ensure full compliance with the intent of the applicable NRC regulations and guidelines, including the ALARA philosophy. It should be pointed out again that this is not a new or one time program set up for the steam generator repair project. The program, the commitment to it, and all the requirements and reasons for it have existed since FPL entered the nuclear industry, and will be used to complete safely the steam generator repairs.

B. Organization

1. Current Program

The Corporate Health Physicist establishes the corporate radiation protection policy and program, and is also responsible for ensuring that the ALARA principle is implemented. The Staff ALARA Specialist's primary responsibility, under the direction of the Corporate Health Physicist, is to develop, review, and upgrade the ALARA program in accordance with regulatory guidance. The Health Physics Supervisor at each plant is responsible for establishing detailed radiation protection procedures at the plant and is responsible for maintaining exposures ALARA. The present complement of Plant Health Physics personnel is thirty-seven. The average health physics experience for health physics supervisors and health physics operational personnel is over ten years. The plant ALARA engineer's primary responsibility, under the direction of the

Health Physics Supervisor, is to ensure that ALARA practices are implemented in all areas of plant operations and maintenance. Plant health physics personnel have the authority to stop a job in progress if they feel unsafe work practices are being followed.

The Health Physics Supervisor at each plant has a direct line of communication to the Plant Manager and the Corporate Health Physicist, who in turn reports to the Manager of Power Resources Nuclear Services. The Manager of Power Resources Nuclear Services reports to the Manager of Power Resources - Nuclear, who is responsible for all matters concerning the operation and maintenance of FPL's nuclear plants. Those who are responsible for FPL's Health Physics Program have sufficient access to management, on both a corporate and plant basis, to ensure that the ALARA principle is implemented.

2. Steam Generator Repair Program

The individual responsible for supervising and coordinating the Health Physics Program for the repair project is the steam generator repair health physics supervisor (SGR-HPS). He reports to the Health Physics Supervisor and is assigned full-time to the project. He will have approximately seven supervisory and three technical personnel reporting to him for the project. In addition, there will be at least sixty Health Physics Technicians (contract Health Physics Technicians) assigned to the project.

In addition to the Health Physics Shift Supervisors assigned to him for the repair, the SGR-HPS will be supported by the ALARA Engineer, the ALARA Technician, and the Rad-Waste Supervisor. He will also receive routine review and assistance from the Plant

Health Physics Supervisor and the Corporate Health Physicist.

3. Conclusion

The FPL health physics organization is designed to ensure that the Health Physics Program, including the ALARA concept, is properly implemented. FPL believes that its current policy and current organization, expanded for the project, are appropriate and sufficient for application to the steam generator repair project.

C. Training

1. Current Program

All unescorted personnel working in the Radiation Controlled Area (RCA) are required to attend an approximately twenty-hour Radiation Protection Training Course which covers in detail the basic theory and practice of radiation protection principles, emergency planning, and FPL's radiological protection program. The course includes lectures, films, practical demonstrations, and other material. Additionally, all such personnel are required to take a comprehensive written examination and to pass it with a grade of 70% or greater in order to receive an unescorted access badge, which allows them to enter the RCA without an escort. Personnel who pass the examination must be reexamined every two years (with a six month grace period) in order to retain their unescorted access badge. Individuals who score between 55% and 70% on the health physics exam are required to repeat the course and pass the exam prior to working in the Radiation Controlled Area. Any individual who scores less than 55% is excluded from the RCA and is not permitted to retake the exam until the Health Physics Supervisor has determined that a reasonable time has elapsed. Individuals with

prior nuclear experience may waive part or all of the twenty-hour course at the discretion of the Health Physics Supervisor but are required to pass the comprehensive examination.

In special cases in which an individual with unique skills is required to work in the Radiation Controlled Area, the Health Physics Supervisor may waive any of the above requirements if he establishes alternate control measures. These may include continuous escort control with a trained escort assigned to each individual or group of individuals. Similarly, visitors and non-radiation workers (personnel who normally work outside the RCA) are required to be escorted while in the Radiation Controlled Area.

A full-scale mock-up of the steam generator channel head has been used for the past one and one-half years to train personnel for working on and in the channel head.

2. <u>Steam Generator Repair Program</u>

Additional facilities are being prepared for essentially continuous training activities. The steam generator repair operations will be emphasized in the training program by pointing out special considerations in the repair effort. The steam generator channel head mock-up and the various scale models (see description under D.2. below) will be used extensively for training.

3. <u>Conclusion</u>

FPL has an extensive, proven radiation protection training program in operation which will be geared toward the steam generator repair to ensure that all personnel working in the Radiation Controlled Area will be adequately trained.

D. Task Planning

1. Current Program

All activities in the Radiation Controlled Area are evaluated for dose-rates or estimated man-rem and are performed pursuant to a Radiation Work Permit (RWP). Activities which entail significant exposure (e.g. 50 mr/hr whole body exposure rates) are preplanned. Activities for which whole-body exposure rates are expected to be 50 mr/hr will be analyzed for man-power planning and estimated man-rem. 50 mr/hr is a guideline number that, based on experience, may cause accumulation of significant man-rem. Areas less than 50 mr/hr may be looked at if the activity requires a large expenditure of man-hours. If a particular activity is estimated to produce greater than 1-2 man-rem of exposure it will be evaluated further to determine if effective action can be taken to reduce the occupational exposure associated with that activity. Such action, if taken, may consist of any or all of the following:

- Temporary Shielding
- Decontamination
- Mock-up Training
- Dry Runs
- Equipment Modification

As part of the evaluation and implementation of necessary ALARA actions, a RWP is written which specifies the following:

a. Description of the Task
b. Radiological Conditions
   Radiation levels
   Contamination levels
   Airborne contamination levels
c. Protective Clothing Requirements
   Type and quantities

d. Monitoring Requirements
   Any special personnel monitoring such as extremity badges, neutron badges, etc.

   Portable survey instruments required to monitor general radiation levels

   Special or periodic surveys by Health Physics personnel.

e. Special Considerations
   Decontamination required
   Special shielding required
   Containment of radioactive materials
   Special notifications

The RWP is posted at the entrance to the Radiation Controlled Area and at the entrace to the job location.

In addition to the use of Radiation Work Permits, it is FPL's practice to provide periodic coverage by health physics personnel for all work in the Radiation Controlled Area. Continuous health physics coverage is provided for those activities which present the potential for significant radiation exposures. An example would be steam generator channel head entry.

2. Steam Generator Repair Program

The majority of work activities associated with the repair effort will be accomplished by utilizing standard construction practices. Nevertheless, FPL will employ several planning aids to facilitate performance of the activities and to reduce occupational exposures.

The full-scale mock-up of the steam generator channel head will be utilized for the purpose of training personnel in removal of

the steam generator manway covers, installation of temporary manway covers required for channel head decontamination, and cutting of the channel head divider plate.

Additionally, a ½" = 1'0" scale model of the Unit 4 containment and major component internals, and the Unit 3 containment in the area of the equipment hatch, and a ½" = 1'0" scale model of the steam generator and internals have been constructed. The containment model is a valuable tool in determining occupational radiation exposure and studying methods for reducing doses. For example, the model will serve the following purposes:

a. <u>Shielding</u>

The model, in conjunction with actual field survey data, can be used to study radiation fields to assist in determining temporary shielding requirements.

b. <u>Man-Rem Assessment</u>

The model has been an aid in predicting the expected man-rem doses for activities in high radiation areas. Decisions related to radiation exposure, such as employing local decontamination or determining the number of people required for an activity, can be made early in the design phase of the project in order to incorporate the most effective solutions to the reduction of exposures.

c. <u>Craft Training</u>

The model can be used for the orientation and training of supervisory and key craft personnel to supplement construction work plans, to achieve the most efficient utilization of manpower in high radiation areas, and to reduce overall man-rem doses by minimizing the time spent in these high radiation areas.

The containment model, the steam generator channel head mock-up, and the steam generator internals model have been used to develop construction work plans. For example, these plans consist of the organization of task activities, methods of movement and operation of equipment, and other procedural steps to provide efficient use of manpower and to ensure that occupational exposures are maintained ALARA. Most of the activities associated with the repair have been preplanned with ALARA considerations taken into account. This includes projecting man-hours and man-rem for each task. FPL Health Physics preplanning has been underway since 1977. For example, the steam generators will be filled with water on the secondary side and will not be drained until immediately before the channel head cut. The water in the filled steam generator will provide shielding for the workers from the radiation inside the steam generator. Finally, when beneficial, post-

operational debriefings will be used for activities involving major radiation exposure to utilize the experience gained during the activities for planning future tasks.

3. Conclusion

Preplanning for routine and special activities has always been an FPL operating philosophy and is necessary to provide for an efficient, organized, and safe operation. This necessary planning is expanded and emphasized for the steam generator repair project.

E. Administrative Controls

1. Current Program

a. Access Control

Security personnel and Health Physics technicians control access to the Radiation Controlled Area (RCA) and to the containment, where individuals are checked for access requirements. Daily pocket dosimeter readouts of individual radiation exposures and compliance with existing plant health physics administrative procedures are used to limit access to the Radiation Controlled Area and containment building only to those individuals who have little potential for exceeding their weekly, quarterly, or yearly FPL radiation exposure guidelines. Those guidelines are themselves more stringent than the NRC established radiation exposure limits. A computer output indicates individuals that are very near or at administrative exposure limits. Additionally, individuals are checked for accumulated dose on pocket dosimeters when leaving the containment, and when leaving the RCA.

b. Protective Clothing

The fundamental purpose of radiological protective clothing is to provide a barrier between contamination existing in a work area and personnel who enter the area. All persons working with radioactive material where contamination of the person is possible are required to wear protective clothing appropriate to the work involved, as stated in the Radiation Work Permit. Such clothing provides protection against loose contamination. Additional protective clothing may be required for highly contaminated areas. In order to reduce the spread of contamination, the outer set of protective clothing will be removed when leaving the work area and deposited in a container. The final set will be removed in a designated area outside the containment and also deposited in a container.

c. Respiratory Protection Equipment

Under normal working conditions, airborne radioactive material concentrations are controlled by engineering measures, such as enclosures or confinement and the ventilation and filtering of work areas. Respiratory protection equipment is used when effective engineering control measures are not feasible or cannot be applied.

All activities in the Radiation Controlled Area are evaluated for potential or existing radioactive airborne contamination. Respiratory protection equipment is individually assigned to qualified persons by Health Physics as needed and is specified on the Radiation Work Permit.

Individuals who wear respirators are trained in their use and fitted in a test atmosphere to ensure a proper seal prior to working in a radiological atmosphere requiring such controls. They must also pass a physical before they are considered qualified to wear a respirator.

d. Low Background Waiting Areas

Proper planning and scheduling of work activities in relatively high radiation areas is required to ensure that workers in these areas receive prompt support in order to accomplish their tasks in the least amount of time possible and to maintain occupational exposures as low as is reasonably achievable. Since these tasks involve work in relatively high radiation areas, it is not desirable to allow support personnel to remain in these areas for appreciable lengths of time. Consequently, support personnel will remain in low background waiting areas, or relatively low radiation areas, until needed.

The low background waiting area is based upon the criterion that the radiation field within the area is no greater than a designated Zone III (equal to or less than 15 mr/hr). Low background waiting areas are not established outside of the containment because of the requirement that workers remove their protective clothing when leaving the containment.

Low background waiting areas are established by the Turkey Point Health Physics staff based on radiation surveys taken periodically by Health Physics personnel. Signs are

posted in various areas of the containment buildings to specify those areas designated as low background waiting areas. Signs are also used to warn personnel of high radiation areas in the containment, as required by FPL's health physics procedures. Health physics personnel work with the job supervisors so that personnel not required immediately in the work area remain in a low background waiting area.

2. Steam Generator Repair Program

a. Access Control

The following is a brief description of the access control pathway currently contemplated for entering and exiting the containment:

Personnel will enter the locker area, disrobe, and, after proceeding through the radiation control point, pick up their protective clothing in a connecting area and dress before entering the equipment hatch into the containment. Personnel leaving the containment will remove their rubber shoe covers and rubber gloves at an access control point just outside the equipment hatch before stepping onto the step-off pad. These personnel will immediately proceed to the undressing area to undress and be frisked for residual contamination. They will then exit through the radiation control point and return to the locker area for their street clothes.

Access control by Health Physics personnel will be provided at the radiation control point and the equipment hatch. Additionally, access will be restricted to "contaminated areas" and high radiation areas. The contaminated area is defined as that area where transferable beta-gamma contamination is greater than or equal to 1000 dpm/100 cm^2 averaged over a major portion of the area. A high radiation area is defined as any area accessible to personnel, in which there exists radiation at such levels that a major portion of the body could receive in any one hour a dose in excess of 100 mrem. Entry into contaminated areas or high radiation areas is subject to control procedures established by Health Physics and the Nuclear Plant Supervisor. Those areas are either barricaded or posted and an RWP is required for entry.

b. Protective Clothing

The requirements for protective clothing during the steam generator repair will be the same as the existing program. The containment will be decontaminated (see section I.H.2 of this affidavit) resulting in decreased need for protective clothing in some areas.

c. Respiratory Protection Equipment

Personnel in the containment during the repair will wear respiratory protection equipment when necessary. However, most of the workers inside the containment during the repair will have no need to wear respiratory protection equipment, since the airborne concentrations to which they

will be exposed are expected to be insignificant. Only one activity during the repairs, cutting of the channel head, is anticipated to produce significant levels of airborne concentrations. Airborne activity generated by cutting of the channel head will be contained within the contamination control envelopes, as described in Section I.I infra, and workers inside these envelopes during these operations will wear respiratory protection equipment commensurate with airborne concentrations as determined by sampling and monitoring. Similarly, workers involved in removing contaminated nonmetallic insulation will also wear respiratory protection equipment. Since experience at the plant indicates that containment airborne radioactivity does not show a measurable increase, except locally, during insulation removal, other workers in the containment will not need to wear respirators to protect against the airborne activity produced by removal of the insulation. It is normal practice to wet this insulation just prior to removal which reduces the amount of material becoming airborne.

Other activities in the containment during the repair, such as cutting and removal of concrete, are not expected to produce significant levels of airborne activity. Nevertheless, airborne radioactivity inside containment during the steam generator repair effort will be controlled, monitored and ultimately released via the plant vent stack.

d. Low Background Waiting Areas

Low background areas already established for previous shutdowns will be used for the steam generator repair. Additional low background areas may be established as needed during the progress of the repair project.

F. Monitoring Relevant to Maintaining Occupational Exposures ALARA

1. Current Program

In order to implement the Health Physics program and maintain exposures ALARA, the presence of radiation and contamination levels must be detected and measured.

The personnel monitoring program tracks both external and internal exposures. For internal exposures, airborne activity is monitored to ensure that proper respiratory protection is provided when needed and to account for potential inhalation of radioactivity. Additionally, a bioassay program, including whole body counts, is used to audit internal doses to personnel. The Respiratory Protection Manual and implementing procedures further amplify the instructions in the Health Physics Manual.

For external monitoring, Thermo-Luminescent Dosimeters (TLDs) are used and processed at least monthly or whenever an administrative limit is approached. The program provides for special neutron TLDs whenever the possibility of neutron exposure exists. (Due to the removal of all fuel from the reactor vessel and containment, neutron exposure will not be a factor in the Steam Generator Repair Project.) The Health Physics Manual specifically discusses the use of additional TLDs to provide backup monitoring of

the extremities. For instance, depending on dose rates, wrist TLDs are utilized to ensure that exposures to the extremeties (hand and forearms) are properly monitored.

In addition to the TLDs worn by all personnel entering the Radiation Controlled Area, all personnel will also carry self reading pocket ionization chambers (pocket dosimeters). These devices can be quickly and easily read by the individual simply by looking into the device while pointing it at a light. This allows the individual, his supervisor, or Health Physics personnel to determine his exposure at any given time. These devices are read and the individuals' exposures recorded at the completion of a work period, or at least daily, to provide assurance that applicable limits are not exceeded. FPL's Health Physics Program specifically provides for using the total of the latest TLD reading and the recorded pocket dosimeter readings to track accumulated exposure for the period of interest (day, week, quarter and year) to ensure that no exposure limits are exceeded. Pocket dosimeter readings are recorded at the exit to the Radiation Controlled Area for specific jobs. These numbers can then be used to determine if total exposures on a task are excessive and ensure that the ALARA concept is met for both individual exposure and total man-rem. It is an NRC and corporate requirement that detailed records of all these monitoring programs be maintained and that all personnel receive cumulative exposure information upon termination of employment.

Additional protection for the workers will be provided by the plant monitoring system. Plant monitoring refers to detection and measurement of radiation and contamination in and around the

plant. Part of the plant monitoring is performed automatically by the Area Radiation Monitoring Systems (ARMS). The ARMS consists of radiation monitors with indication and alarm capabilities located strategically throughout the plant. The ARMS provides continuous monitoring with alarms to give early indication of changes in local radiation levels. Additional radiation, contamination, and airborne activity surveys are performed throughout the plant. The frequency of these surveys depends on the potential for changes in radiological conditions and the personnel occupancy. Finally, continuous Health Physics monitoring of areas with a high potential for changing radiological conditions is provided.

In addition to various regularly scheduled surveys within the Radiation Control Area (RCA), surveys are regularly performed in areas outside the RCA to verify the effectiveness of the Health Physics Program designed to control and contain radiation and contamination. TLDs are strategically located both inside and outside the generating station area and are periodically replaced and measured dose determined to ensure the program is working properly.

It should be stressed that the monitoring procedures described above are normal practices required by regulations, and they are not special programs implemented just for the Steam Generator Repair Project. This monitoring program has been in existence and tested for effectiveness over a period of years, and FPL believes the monitoring program is satisfactory.

2. <u>Steam Generator Repair Program</u>

An adequate number of TLD reading machines, TLDs, and pocket dosimeters will be available for the repair project; additionally one or two whole-body counters will be used. As indicated above, a new computer will provide real-time exposure tracking capability.

G. <u>Use of Automatic Tooling</u>

1. <u>Current Program</u>

Automatic tooling is continuously evaluated, improved and implemented where applicable. For example the positioning tool for steam generator tube testing has been modified to require fewer steam generator entries for manuvering. In addition, the electronic monitoring equipment has been moved outside the containment to a remote trailer for remote test monitoring, using closed circuit television.

2. <u>Steam Generator Repair Program</u>

Automatic tooling will be utilized to the maximum extent practicable to:

a. Reduce the manhours required to perform a special task, and/or

b. Allow the workers to be further away from the radiation source, and/or

c. Allow the workers to remain behind a shield while the task is being performed by an automatic device.

The state-of-the-art for remote cutting and welding apparatus is continuously changing throughout the industry. The

developments in the field will be followed, and selection of such tools for use during the steam generator repair project will be made at a time consistent with supporting the repair outage. These tools and techniques will be evaluated using the following considerations:

a. Manhours required to set up the equipment.

b. Manhours required to perform the task

c. Experience with the use of the proposed equipment.

d. Cost and schedule impact associated with development of the equipment.

e. Space limitations within the steam generator cubicles inside the containment building.

For example, an automatic, track-mounted oxy-acetylene torch assembly may be utilized for making the steam generator channel head and upper girth cuts. Track-mounted, automatic milling machines may be utilized for making the channel head and upper girth cut end-weld preparations. Track-mounted, automatic/combination cutting/weld prep machines may be utilized for removing sections of the main steam and feedwater piping; track-mounted, automatic welding machines may be utilized for re-welding these previously removed portions of main steam and feedwater piping.

All of the above techniques and tooling devices, which are currently available in the industry, will be evaluated using the above mentioned considerations. Any new developments in the field will be followed and selected at a time consistent with supporting the repair outage.

H. Decontamination

1. Current Program

Decontamination of local or general areas and equipment is a current and continual practice. Decontamination processes are used primarily to reduce transferable contamination levels but also are used in removing fixed contamination to reduce radiation levels. The frequency of decontamination is highly dependent on the accessibility and use of the area and/or the specific work to be performed. Several reasons for decontamination are:

a. minimize the potential for personnel contamination
b. reduce the need to use additional protective clothing
c. reduce the potential of airborne contamination
d. reduce the amount of radioactive waste generated
e. lower and/or control contamination and radiation levels to confined areas
f. release or reuse tools and equipment which have been contaminated

The need to decontaminate is reviewed on the basis of ALARA effectiveness.

2. Steam Generator Repair Program

To lessen the total man-rem accumulated, a general decontamination of the containment is planned during the initial phases of the steam generator repair. This operation consists of cleaning most of the exposed surfaces of the containment in the areas where work tasks in support of the steam generator repair are

scheduled. The removal of a significant portion of the slightly radioactive surface dust and dirt from such areas has two beneficial effects: 1) the overall background radiation level is lowered in those areas due to removal of a significant contributing source; hence exposure of the work force during the remainder of the outage is reduced; and 2) the spread of transferable surface contamination is significantly reduced, so clean areas remain clean and the incidence of contamination of workers in such areas is greatly lessened.

In the channel cut approach, some decontamination of the channel head region of the steam generators would be advantageous in maintaining exposures to a minimum. Consequently, interior surfaces of the channel head and divider plate will probably be decontaminated.

Finally, local work areas will be monitored for contamination on a periodic basis and will be decontaminated as necessary. It may be necessary to stop work activities to decontaminate areas for reasons stated under Section H.I., above.

I. Use of Contamination Control Envelopes

1. Current Program

When specific activities dictate, localized envelopes or enclosures are utilized to contain airborne particulates generated during cutting, weld preparation, welding activities, and any other activities that generate radioactive airborne contamination.

2. Steam Generator Repair Program

It is anticipated that localized envelopes will be required for the steam generator channel head work. Enclosures have been designed to

accomodate the work operations in these areas. However, it is not anticipated at this time that localized envelopes will be required for cutting, weld preparation, and welding on the steam generator upper assemblies, because the contamination levels are so low that they should not present an airborne contamination problem.

The design of the contamination control envelopes consists of galvanized steel enclosure structures (one for each steam generator channel head area) which makes use of existing concrete walls where practicable. Each enclosure structure has two (2) windows, a ventilation inlet with roughing filer, and a double door access area. The structures will be joined to the concrete walls and steam generators by angle irons and sealed with an air setting sealing compound for relative air tightness.

Each enclosure has a roughing air inlet filter which will provide make-up air to satisfy the exhausted air flow requirements. This inlet air will be ambient air coming in from the equipment and personnel hatches.

The first of both doors associated with each enclosure allows personnel entrance into a vestibule area. The second door allows entrance into the enclosure itself. Each enclosure has been designed to operate at a continuous negative air pressure. Therefore, any momentary opening of either door allows air to rush into the enclosure assuring that there is no release of enclosure air except through the designed filter exhaust system.

Each enclosure is exhausted in parallel to the filter exhaust unit. This unit is a combined base-mounted unit, will be located in an area adjacent to the three steam generators, and consists basically of pre-filters (30-60 per cent efficient), HEPA filters (99.97 per cent efficient), and an exhaust fan. Discharge of the filtered air will be to the existing plant purge exhause system which will be operating continuously.

The filter exhaust unit has been designed so that isolation of one enclosure does not defeat exhaust capabilities of the others. Pressure drops across the pre-filters and accross the HEPA filters will be separately monitored to determine replacement needs.

Finally, it should be noted that the contamination control envelopes will be monitored.

J. Use of Shielding

1. Current Program

Temporary shielding is used in FPL's Health Physics Program. However, the use of such shielding involves trade-offs.

For example, installing two inches of temporary lead shielding around component "X" will generally reduce the dose rate at adjacent work location "Y" from 1 rem/hour to only 0.1 rem/hour. Thus, for a 2 man, 3 hour job at "Y", the exposure could be cut from 6 man-rem to .6 man-rem. However, it should also be noted that one 4" by 8" by 2" thick lead brick weighs about 30 pounds. Installing and removing lead bricks requires the expenditure of both man-hours and man-rem. Obviously, installing a dozen bricks on a small hot spot would probably be ALARA effective. Just as obviously, installing several thousand bricks probably would not, since the man-rem incurred by installing and removing the lead brick shield would probably exceed the man rem savings which result from the lower radiation fields. Most cases involving temporary shielding fall somewhere between these two extremes.

Lead brick, lead sheet and various sizes of iron plate are available and have been used frequently in the existing program to reduce dose rates. For example, during a previous modification of

the steam generator internals, lead blankets were placed around the tube bundle to reduce dose rates.

2. Steam Generator Repair Program

For the activities associated with the repair, the need for temporary shielding will be determined on a case by case basis. This determination will include a consideration of the estimated exposure that would be received by personnel performing the installation and the removal of the shielding and the estimated exposure to be received for the job to be performed without the use of shielding. Also taken into account in evaluating the need for temporary shielding will be the dose rate, the time required to install and remove the temporary shielding, and weight and space limitations. If it is determined that installation of temporary shielding is ALARA, the type and amount of shielding will be determined by Health Physics personnel.

In general during the repairs, temporary shielding will be used, as necessary, to reduce the dose rates from components such as the reactor coolant pumps and reactor coolant piping. Although the steam generator shell, cover plates, and secondary coolant will provide some shielding for activities performed outside the steam generators, temporary shielding will also be used, as necessary, inside the channel-head while it is being prepared for fit-up to the new steam generator section.

K. Conclusion

FPL's Health Physics Program embodies all of the principles inherent in a good radiation protection program. Administrative controls

will be combined with training, the proper equipment and facilities, dose reduction techniques such as shielding and decontamination, and competent and qualified Health Physics personnel for the purpose of maintaining occupational exposures ALARA during the repairs.

II. Transient Workers

Contention 2 also questions whether FPL's procedures regarding transient workers will comply with 10 CFR Part 20.

The concern expressed in this part of the contention arose from the promulgation of a rule regarding occupational exposures of transient workers at 44 Fed. Reg. 32349 (June 6, 1979). See Dr. Paris' opinion, Ordering Ruling on the Petition of Mark P. Oncavage (August 3, 1979), pp. 46-47. This rule establishes the following relevant requirements:

1) A licensee may not allow a transient worker to enter into a restricted area in which the individual is likely to receive an occupational exposure in excess of 25% of the standards of 10 CFR 20.101(a), unless the individual first supplies a written statement disclosing his prior occupational exposure for the current calendar quarter.

2) A licensee may not allow a transient worker to receive an occupational exposure in excess of the standards of 10 CFR 20.101(a), unless a licensee first obtains a certificate on Form NRC-4.

3) A licensee may not allow a transient worker to exceed the standards in 10 CFR 20.101(a) for all sources of occupational exposure, including sources other than the licensee's.

The wording of 10 CFR 20.101, before its amendment at 44 Fed. Reg.

32349, left a possibility that a worker employed by two or more companies in the same quarter could receive the dose limit of 1.25 rem (3 rem if certain conditions are met) from each of the companies involved. Thus, an individual could, consistent with the wording of the regulation, receive more than the prescribed limiting exposure. The regulation has now been reworded to eliminate the possibility.

FPL would expect to be use some transient workers for the repairs. Consequently, the new rule on transient workers will undoubtedly apply to at least some of the manual workers employed during the repairs. However, the new rule is academic as far as FPL's practices are concerned. It has long been the policy of FPL to ensure that total occupational exposure, whether received at FPL or elsewhere, is maintained at or below the applicable limits.

It is FPL's practice to limit all radiation workers to a maximum exposure of 250 mrem/quarter until their current radiation exposure history for the quarter is known. In addition to the quarterly history, every reasonable effort is expended to assure that the information projected in the individuals completed NRC Form 4 document is complete and accurate. No worker is allowed to receive more than 1100 mrem/quarter until his lifetime exposure history is known. The maximum accumulated quarterly exposure that FPL allows any individual has always been less than established federal limits.

III. Conclusion

As demonstrated above, FPL's Health Physics Program for the repairs complies with the ALARA principle and FPL's procedures for handling transient workers satisfies 10 CFR Part 20.

FURTHER AFFIANT SAYETH NOT.

Date 4/9/81

Harvey F. Story
H. F. Story

STATE OF FLORIDA)
) SS.
COUNTY OF DADE)

SWORN to and subscribed before me this 9th day of April, 1981.

Cheryl L. Fredrick
Notary Public

My Commission Expires:
Notary Public, State of Florida at Large
My Commission Expires October 30, 1983
Bonded thru Maynard Bonding Agency

STATEMENT OF PROFESSIONAL QUALIFICATIONS

Harvey F. Story

Present

Certified Health Physicist
President, Nuclear Power Resources, Inc.
6040 S. W. 82 Avenue
Miami, Florida 33143

Professional Experience

1976-1981

FPL Power Resources Nuclear Staff-Corporate Health Physicist. Responsible for all staff activities in the areas of Radiation Protection, Emergency Planning, Radiological Environmental Monitoring, Radiochemistry, and Waste Management. Directly supervised six staff personnel. The entire company program was implemented by a total plant staff of about seventy Health Physics and Radiochemistry permanent personnel plus various consultant and service personnel.

1974-1976

FPL Power Resources Nuclear Staff Health Physicist. Developed and administered FPL corporate radiation protection program. Established centralized in-house personnel monitoring system. Spent several days each month at plant sites during shutdown and operation.

1973-1974

Assigned to St. Lucie Plant as Health Physicist. Responsible for establishing and implementing complete Radiation Protection Program, including decontamination, waste management, environmental monitoring, and emergency planning.

1971-1973

Health Physics dept., Turkey Point Plant (PTP). Acted as Assistant Health Physicist in organizing and developing Health Physics program. Wrote the majority of all health physics procedures. Responsible for the Health Physics night crew during fuel loading of Units 3&4 at PTP. Directly supervised many activities such as calibration of area monitors, changing reactor coolant filters, decontamination, etc. Assumed all of the Health Physicist's responsibilities during his absence.

1970-1971

FPL Turkey Point Plant. Assigned to procedures group. Wrote preoperational and operational procedures on primary systems such as process and area monitoring systems, reactor coolant system, and auxiliary systems.

1969-1970	Attended graduate school at Texas A&M University on a teaching assistantship. Gained limited experience in radiochemistry, reactor engineering, and health physics.
1967-1969	Freshman Chemistry Instructor; taught laboratory courses in General Chemistry & Qualitative Analysis.

Education

B.S., Chemical Engineering, Georgia Institute of Technology
M.S., Nuclear Engineering, Texas A&M University
Additional Course Work:
- Nuclear Reactor Engineering, University of Missouri
- Health Physics, Rockwell International
- Health Physics, University of Michigan
- Various industry business and management courses.

Professional Recognition

Health Physics Society
EEI Health Physics Task Force
EEI Technical Committee on Low Level Exposure
AIF Working Group on Occupational Exposure
AIF Working Group on Appendix I Technical Specifications
Member of American Board of Health Physics Examining Board for Power Reactor Health Physics Certification.
Certified by American Board of Health Physics in both General and Power Reactor Health Physics