UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

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

AFFIDAVIT
OF
ALAN J. GOULD

My name is Alan J. Gould. My business address is 9250 West Flagler Street, Miami, Florida 33152. I am employed by Florida Power & Light Company (FPL) as a Power Resources Radwaste and Radiochemistry Specialist. A statement of my educational and professional qualifications is attached to this affidavit and made a part hereof.

The purpose of this affidavit is to address the Licensing Board's Memorandum and Order of May 28, 1981, which directed the parties to file "detailed information concerning the handling, storage, transportation or other disposition to be made of low level solid waste that may be produced at the Turkey Point facility as a result of the proposed steam generator repairs."

As a result of my employment with FPL, I am familiar with FPL's plans for disposal of solid low-level waste generated during the repairs.

The Board's Memorandum and Order dated May 28, 1981, references paragraphs 4 and 7 of the Affidavit of Douglas King dated May 13, 1981,

concerning low level solid waste in "loosely stacked, sealed drums in roped off areas." The drums observed by Mr. King during his April 19, 1981, visit to the Turkey Point Plant were the approximately 1,312 55-gallon steel drums currently located within the protected area of the Turkey Point site. These drums are located as follows:

a) 792 in an open area east of Unit 3 outside of the Radiation Controlled Area (RCA).

b) 108 east of Unit 4 just outside the RCA fence.

c) 156 just east of Unit 4 within the RCA.

d) 256 to the south of Unit 4 also within the RCA.

Approximately 1,162 of the drums contain about 5,810 cu-ft of dirt[1/] with an estimated average specific radioactivity concentration of about 71.4 pci/g or a total activity of about 21 mCi. All of the drums currently located outside the RCA contain such dirt. Additionally, another approximately 100 drums (all located within the RCA) contain concrete rubble with an estimated specific activity of about 100 pci/g or an additional 2.5 mCi. The remaining 50 drums (all located within the RCA) contain compacted dry trash or decontamination solids and have a total estimated activity of about 270 mCi. It should be emphasized that these 1,312 drums have no relationship to the repairs and are not attributable to the repairs. Indeed, it is expected that some of the drums will be shipped off site prior to the conclusion of the repairs. Nevertheless, as demonstrated herein, even if all of these drums are

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1/Each drum has a capacity of about 7.5 cu-ft, but due to weight limitations, is only filled with approximately 5 cu-ft of dirt.

included in the evaluation of the solid low-level waste which will be handled during the repairs, this poses no radiation hazard of consequence. In fact, the concentration of radioactivity in about 1,262 of these drums is so low that transportation of the drums would be exempt from the Department of Transportation's (DOT) and NRC's regulations which govern shipments of radioactive materials.

In view of the recent restrictions on low-level radioactive waste (LLW) imposed by the burial sites upon nuclear waste generators, it is expected that FPL will generate more low-level waste during the repair period than will be allocated to FPL at the Barnwell waste disposal site. As a result, the following have already been initiated:

1) A volume allocation policy regarding priority of shipments has been instituted by FPL in order to assure that all materials with higher specific radioactivity are removed from the Turkey Point site, and that whatever materials which must be retained will contain relatively low concentrations of radioactivity.

2) In addition to FPL's estimated regular monthly allocation, FPL may obtain additional burial allocation from the first come, first serve pool at Barnwell. From past experience, it is expected that an additional allocation from this source of between 700 cu-ft to more than 1,000 cu-ft will be available to FPL each month.

3) FPL is seeking a permit for shipment of LLW to an alternate waste disposal facility.

FPL's policy for "priority of shipments" works as follows: From FPL's monthly allocation of burial space at Barnwell, FPL initially schedules shipments of low-level wastes which contain relatively high concentrations of radioactivity (e.g., resin, filters, decontamination sludges, etc.). FPL's regular monthly allocation is sufficient to ship to Barnwell all of this type of waste generated during the repairs. The remaining burial allocation is then used for the low-level waste with low concentrations of radioactivity.

The volume of low-level waste that I estimate will be produced by the steam generator repairs is provided in Table 1. The solid low-level waste generated by the repairs will be handled in accordance with approved plant procedures in the same manner as low-level waste which is generated from routine plant operating and maintenance practices. Such provisions include the compaction of dry radioactive compressible trash (i.e., rags, paper and clothing) using a highly efficient waste compactor in order to reduce the volume of this type of waste. Low-level waste which contains a high concentration of radioactivity is kept inside the Turkey Point Radwaste Building during the brief period it is on site (e.g., 2 - 3 months) pending preparations for shipment and transportation. All solid low-level waste located on site will be monitored by portable monitors and swipe tests in accordance with approved plant operating procedures. Shipments offsite will be conducted in accordance with approved plant procedures and applicable DOT and NRC regulations.

To address fully the Board's Order, I have provided in Table 2 an estimate of the total volume[2/] of low level waste which will be produced at Turkey Point 3 & 4 during a two-year period which encompasses the repair. Table 3 provides a comparison between FPL's projected burial space allocation and the low level waste expected to be generated at Turkey Point 3 & 4 during the same two-year period.

As shown in Table 3, the difference between the volume of low level waste with low concentrations of radioactivity which will be generated at Turkey Point 3 & 4 during the repairs (55,253 cu-ft) and the Turkey Point 3 & 4 Portion of Remaining Allocation (19,498 cu-ft) is the volume of low level waste generated during the repairs which Turkey Point may not be able to expeditiously ship to a burial site (35,755 cu-ft). The estimated average concentration of radioactivity in this material is low, approximately 0.00064 Ci/cu-ft. The total activity contained in this amount of waste therefore would be approximately 22.9 Ci.

Although FPL expects this volume to be significantly reduced by shipping LLW to an alternate burial facility and/or by obtaining additional burial allocation at the Barnwell site, due to current Turkey Point facility space limitations, much of this type of waste which will be generated during the repairs may have to be temporarily retained on site in outside areas.

In the event this low concentration LLW must be retained on site, it would be packaged as follows:

2/Excluding Steam Generator Lower Assemblies (SGLAs), which will be stored in the Steam Generator Storage Compound.

1) Compressible trash is compacted into wooden boxes known as LSA boxes which meet the criteria of a strong, tight package under 49 CFR Part 173. These boxes are lined with steel plates and plastic liners. When the boxes are filled, the lids are nailed in place. A steel lid cover is then nailed over the previous lid. The entire box is cross banded with five steel straps. A plastic cover is then placed over the entire box, and the box is rebanded with another five steel straps.

2) Non-compressible solid waste with low concentrations of radioactivity would normally be packaged in steel drums meeting DOT specifications for Type A packaging in accordance with 49 CFR Parts 173 and 178. Drum lids are clamped into place and held securely by a bolting ring.

As previously discussed, solid LLW which contains relatively high concentrations of radioactivity is kept in the Turkey Point Radwaste Building until shipment. This facility has been designed to withstand the forces of hurricanes and tornados, and consequently this waste does not contribute to the potential for a radioactive release during one of these events. In order to minimize the potential for any release of radioactivity from LLW with relatively low concentrations of radioactivity produced during the repairs, the following precautions will be taken:

1) Only LLW containers with low concentrations of radioactivity may be retained in outside locations.

2) Outside retention areas for waste produced during the repairs will be within the Turkey Point 3 & 4 RCA at elevation 17.5 ft MLW.

3) LSA boxes weigh approximately 4,000 lbs. each when filled. LSA boxes which must be retained outside because they cannot be expeditiously shipped will be tied or banded together in blocks of four providing a subassembly weighing approximately 16,000 lbs. They will be stacked no more than two high. Additionally, tie downs will be used for groups of these subassemblies. Plastic covers and/or tarps will be used to protect these containers from inclement weather.

4) Drums containing LLW which must be retained outside because they cannot be expeditiously shipped, will be palletized and tied or banded together in groups of four. They will be stacked no more than two high. When stacked, the top and bottom subassemblies will be tied or banded together, providing an assembly weighing approximately 4,000 lbs. Additionally, tie downs will be provided for those assemblies which will be grouped together.

5) In the event that FPL receives a warning of an approaching hurricane or imminent tornado, additional measures would be taken as necessary to further secure these waste containers in accordance with the Turkey

Point 3 & 4 Plant Procedure governing natural emergencies.

Additionally, the radioactivity contained in about 1,262 of the 1,312 drums which have been discussed previously is extremely low, approximately 23.5 mCi total. Seven hundred ninety two (792) of these drums are currently located at an elevation of approximately 5 ft MLW within the protected area. The remaining number are located at an elevation of 17.5 ft MLW. To minimize the potential release of this material due to a hurricane or tornado, all of the drums not currently at elevation 17.5 ft MLW will be moved to that elevation. They will be placed on a foundation of compacted crushed rock, palletized, banded together and additionally secured as discussed above. Consequently, all of the 1,312 drums which cannot be expeditiously shipped will be located at elevation 17.5 ft MLW and will be appropriately secured.

Based on the following, I have concluded that the impact of a hurricane or tornado on the LLW which might be retained at Turkey Point during the steam generator repairs poses no radiological hazard of significance:

1) The total estimated burial volume of LLW with low concentrations of radioactivity that might have to be retained outside on site during the repairs (including the 1,312 drums) is approximately 45,600 cu-ft. This represents a total estimated quantity of radioactivity of about 23.2 Ci. FPL expects that the actual volume which will have to be retained will be significantly less than this estimate because of additional Barnwell burial allocation or disposal at an alternate site.

2) The volume of waste retained would not reach a maximum until the end of the repair of the second unit.

3) Due to the protective measures which are being taken to stabilize the waste containers against impacts from a hurricane or tornado, it is extremely unlikely, even if such an event would occur, that a large number of the packages would be breached.

4) Due to the integrity afforded by the packaging, it is unlikely that all of the radioactivity would be released from a breached container. In this regard, it is appropriate to refer to analyses which have been previously performed by the NRC of breaches of waste containers during waste handling or transportation accidents, in which the release factors for the breach of a container range from 10^{-3} to 10^{-6} of the amount of activity in the containers.[3/]

5) In the event of a breach of a container and the release of the waste therein, most of the radioactivity contained in the waste would be bound by the waste itself and would not be released as particulates. Studies[4/] have been conducted which

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3/ Final Programatic Environmental Impact Statement related to decontamination and disposal of radioactive wastes resulting from March 28, 1979 accident, Three Mile Island Nuclear Station, Unit 2 (NUREG - 0683), March 1981; and

Environmental Survey of Transportation of radioactive material to and from nuclear power plants - U.S. Atomic Energy Commission, December 1972.

4/ Brodsky in the Health Physics Society Journal (Volume 39, No. 6, Pages 992-1,000, December 1980).

indicate that empirical data exists to confirm "real world" values for resuspension in air of the radioactivity to be in the range of 10^{-6} to $10^{-9} m^{-1}$. A resuspension factor of $10^{-5} m^{-1}$ would be conservative. Consequently, the most significant impact for any waste which is released from a breached container would be that the waste might be physically displaced and redeposited in unrestricted areas. However, it is very unlikely that a significant quantity of waste material would be displaced to unrestricted areas. Even if this occurred, most of the activity associated with this type of release would have a high probability of being recovered.

6) No credit has been taken for the normal radioactive decay process.

Even if an extremely conservative assumption is made that 10 percent of the 23.2 Ci of radioactivity were released into the environment from this LLW due to the impact of a hurricane or tornado, the potential consequences (environmental radiation dose) which would result would be less than those which have been previously estimated for various postulated accidents because the postulated quantity of radioactivity released would be less than the quantity assumed to be released during the SGLA drop accident, less than the quantity assumed to be released to the groundwater from the SGLAs, and less than the quantity assumed to be released from the SGLAs to the hurricane flood

surge.[5] These references indicate that such releases would be within 10 CFR Part 20 limits, even though these limits "are applicable to normal reactor operation, rather than accident conditions."[6]

FURTHER AFFIANT SAYETH NOT.

Date June 12, 1981

Alan J. Gould
ALAN J. GOULD

STATE OF FLORIDA)
) SS.
COUNTY OF DADE)

SWORN to and subscribed before me this 12 day of June, 1981.

Cheryl L. Fredricks
Notary Public

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

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[5] See Final Environmental Statement for the Turkey Point Steam Generator Repairs, § 4.4; Letter from Robert E. Uhrig to Steven A. Varga, dated February 17, 1981, item 3; Affidavit of F. G. Flugger, H.H. Jabali and P.K. Wan on Contention 4B, pp. 15-16; Memorandum and Order of May 28, 1981, p. 35; Affidavit of Frederick G. Flugger and H. H. Jabali on Contention 4A, pp. 10-11, 16.

[6] Memorandum and Order of May 28, 1981, p. 36.

TABLE 1

SOLID WASTE FROM THE REPAIRS (PER UNIT)

	Quantity (cu-ft)
Steam Generator Lower Assemblies	10,500
Channel Head Decontamination	1,260
*Concrete	1,620
Reactor Coolant Cutting and Weld Preparation	7
*Rags, Paper and Clothing	13,050
*Sand, Miscellaneous Concrete, Tools and Scaffolding	3,000
Waste Ion Exchange Resins and Filters	765
Spent Resin	133
Non-Compressible Filters in Liners	400
*Lagging	2,100
TOTAL	32,835 cu-ft (930 cu-m)

* Waste with relatively low concentrations of radioactivity.

TABLE 2

Solid LLW Generated at Turkey Point 3 & 4 During a 24-Month Period Encompassing the Repair Project (Cubic Feet)

Volume of LLW "Priority Shipping"	Volume of LLW With Low Concentration Of Radioactivity	Total Volume of LLW Generated at Turkey Point
8,395	55,253	63,648

TABLE 3

Comparison of LLW Generated at Turkey Point 3 & 4 During a 24-Month Period Encompassing the Repair Project with FPL's Projected Allocation of Burial Space - (Cubic Feet)

FPL Total Burial Allocation at Barnwell*/	FPL Volume of Priority Shipment LLW	FPL Allocation Remaining	Turkey Point 3 & 4 Portion of Remaining Allocation	Turkey Point Volume of LLW with Low Concentration of Radioactivity	Excess Which Turkey Point May Not Be Able to Ship
46,410	15,387	31,023	19,498	55,253	35,755

*/ This only includes FPL's estimated regular monthly allocation.

Name: A. J. Gould

Position: Radwaste and Radiochemistry Specialist

Education: AA, Science

Presently enrolled at Florida International University completing upper class course work in Industrial Engineering Technology

Summary:

Florida Power & Light Company	9 Years
General Office Staff	
Radwaste and Radiochemistry Specialist	-1 Year
Nuclear Water Chemistry Specialist	-1 Year
Nuclear Water Chemistry Coordinator	-2 Years
Turkey Point Nuclear Plant	
Plant Coordinator - Nuclear Chemistry	-½ Year
Associate Plant Coordinator - Nuc. Ch.	-½ Year
Plant Test Engineer - Nuclear Chem.	-1 Year
Plant Technician - Nuclear Chemistry	-1 Year
United States Navy, Nuclear Submarine Serv.	-8 Years
Leading Engineering Laboratory Tech.	-4 Years
Engineering Laboratory Technician	-3 Years

Experience:

Mr. Gould is employed as a specialist on the General Office Staff of the Power Resources Department. His current responsibilities include operations at FPL's Nuclear Power Stations, which involve monitoring and evaluation of primary system radiochemistry parameters and/or are associated with the handling, treatment or disposal of radioactive materials.

Mr. Gould started his employment with Florida Power & Light Company at the Turkey Point Plant in August of 1972 as a Technician with the Nuclear Chemistry Laboratory. He participated in the initial start up of both of the Turkey Point units. Prior to his transfer to the General Office Staff, Mr. Gould held a position that included responsibility for supervising and coordinating the day-to-day activities of the Nuclear Chemistry Laboratory.

Mr. Gould joined the Power Resources General Office Staff as a member of the Power Resources Services Group in March, 1977. His primary responsibilities were in the area of Operations and other activities associated with Corrosion Protection of Primary and Secondary Systems at FPL's Nuclear Power Stations.

Mr. Gould transferred to the Power Resources Nuclear Services Group in March, 1980.

Prior to employment with Florida Power & Light Company, Mr. Gould served aboard a Nuclear Powered Submarine as an Engineering Laboratory Technician, Plant Operator, and Mechanic.

Professional Memberships: Member, American Nuclear Society

Industry Groups: Utility Nuclear Waste Management Group - Low-Level Waste, Edison Electric Institute

AIF Sub-committee on Solidification of Low-Level Reactor Radwaste, Atomic Industrial Forum, Inc.

Chemical Cleaning Sub-committee, Electric Power Research Institute (EPRI), Technical Advisory Committee to the Steam Generator Owner's Group

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BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

Docket Nos. 50-250-SP
50-251-SP

IN THE MATTER OF FLORIDA POWER & LIGHT COMPANY (Turkey Point Nuclear Generating Units Nos. 3 and 4	))))	(Proposed Amendments to Facility Operating License to Permit Steam Generator Repairs)

CERTIFICATE OF SERVICE

I HEREBY CERTIFY that a copy of of the foregoing Letter to Atomic Safety and Licensing Board and Affidavit of Alan J. Gould was served on the following by deposit in the United States mail, first class, properly stamped and addressed, on the date shown below:

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By Norman A. Coll
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June 12, 1981

*Additional Service By
Hand or Courier on June 15, 1981