TERA

UNITED STATES NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

In the Matter of HOUSTON LIGHTING AND POWER COMPANY (ALLENS CREEK, UNIT 1)	))	Docket No. 50-466 August 3, 1979
Madeline Bass Franzen's Robert S. Franzen's	))	SUPPLEMENT TO CONTENTIONS

Pursuant to 10 CFR 2.714 (a)(3), the petitioners' contentions of April 13, 1979, relative to a spent fuel meltdown (SFM) that is possible at ACNGS, are herewith amended and "refined"*.

1. Further substantiation of the postulation of a SFM at ACNGS is the document prepared for the USNRC, "Spent Fuel Heatup Following Loss of Water During Storage" (NUREG/CR-0649 SAND 77-1371. This study, which supports many of the findings of the WEST German Report AB 290, August, 1976, concurs that the possibility that a SFM could occur unless significant "design modifications" or "effective emergency countermeasures" are instituted. Both the NUREG/CR-0649 Report and the first and second West German Reports AB 290, August 1976 and November 1977, do not negate the possibility of a SFM, but simply rely, in such an event, that plant personnel could proceed with countermeasures in replacement of coolant to deter a SFM. It cannot be debated that such a possibility of a SFM can occur.

As previously stated in our contentions of April 13th, "Aside from the mechanism of sabotage, human and mechanical error, tornadoes and earthquakes causing a spent fuel pool meltdown, there is an alarming possibility of a reactor meltdown precipitating a fuel pool meltdown. This is a possibility because the cooling systems of the reactor and the spent fuel pool are linked together." Following such scenarios, there is every probability that radiation doses would reach such levels that plant personnel would be compelled to evacuate and abandon the reactor. Since the cooling system for the spent fuel pool (SFP) becomes non-functional, the SFP rapidly heats up and proceeds to boiledown and meltdown causing massive releases of lethal radioactivity.

Neither the applicant nor the staff have adequately considered the costs in terms of health as well as the economic costs of a possible accident in the on-site storage of spent fuel. The Final Supplement to the FES (NUREG-0470) fails to discuss the possibility of a SFM and what measures would be instituted to prevent such occurrence. Neither the applicant nor the staff have taken into consideration the requisite of plant design modification to help impede a SFM as recommended by NUREG/CR-0649.

2. Additionally, the applicant has not dealt adequately with the additional hazard involved in the possible storage of spent fuel in closer proximity than originally planned. Manufacturers of high-density storage racks which significantly increase existing storage capability also have not dealt with this additional hazard. In January 23, 1979 Prospectus of Texas Utilities Co., it stated, "...there will be on-site storage capacity for spent fuel to accommodate the operation of the units and this storage capacity can be increased if needed." While petitioners do not have access to a current HL&P Prospectus, there is no doubt ACNGS will be constructed to have a constant increment storage capacity.

If the method to be used for increasing such storage capacity is by the use of high-density storage racks, this particular question needs to be addressed by the applicant.

3. The spent fuel meltdown contention has already been accepted by various Atomic and Safety Licensing Boards on other Dockets. Enclosed is a list of some nuclear plant hearings and their respective Docket Numbers where the contention has already been accepted as valid and pertinent to hearing proceedings. Also enclosed are copies of two sets of contentions, formulated by an eminent nuclear scientist with extensive longevity experience with the Atomic Energy Commission and the nuclear industry in commercial and military reactors, that have been

*Applicant's terminology re "Applicant's Response to Texpirg's Amended Contentions", July 10, 1979.

7910050 762 6

accepted by the Atomic Safety and Licensing Boards on two dockets. The testimony of another eminent nuclear scientist (biography enclosed) on the SFM contention, representing a State on one of these Dockets is also enclosed. What is even more significant to the validity of this contention is the fact that the ASLB on one of the Dockets, in accepting the contention, went further and issued its own succinct questions relevant to a SFM to be discussed in the hearing proceedings. A copy of these ASLB questions are also enclosed. The enclosed contentions on the other Dockets, the related testimony by the expert witness, the poignant questions posed by the ASLB on the other Docket are all relevant and applicable to ACNGS. The overriding concern of the applicant and the USNRC should be safety.

It would appear to be a great incongruity if the spent fuel meltdown contentions that are already accepted by the USNRC in numerous other Dockets, not be considered apposite to the Allens Creek NGS hearings. It is incumbent upon the applicant and the USNRC in its chartered duty to allow this cardinal safety issue to be deliberated on in the ACNGS hearing proceedings.

Robert S. Framson
Robert S. Framson

Madeline Bass Framson
Madeline Bass Framson

4822 Waynesboro Drive
Houston, Texas 77035

Served to:

Chase R. Stephens
Atomic Safety and Licensing Board
Steve Sohinki, Esq.
R. Gordon Gooch, Esq.
Jack R. Newman, Esq.
Richard Lowerre, Esq.
John F. Doherty
Carro Hinderstein
Brenda McCorkle
James Scott, Jr.
F. H. Pettkoff, III
Dr. David Marrack
Wayne E. Rentfro
Katherine Hooker
Dr. Jean-Claude deBremaecker
National Lawyers Guild

SPENT FUEL POOL MELTDOWN CONTENTION IS ACCEPTED IN THE HEARINGS ON THE FOLLOWING DOCKETS:

ZION STATION UNITS 1 & 2	DOCKET NOS. 50-295 50-304
SALEM STATION UNIT 1	50-272
COMANCHE PEAK STATION UNITS 1 & 2	50-445 50-446

In its acceptance of the Spent Fuel Pool Meltdown Contention, the Atomic Safety and Licensing Board, Salem Station Unit 1, Docket No. 50-272, issued on April 18, 1979, the following questions to be part of the hearing:

1. To what extent did the accident at Three Mile Island affect the spent fuel pool at that site?
2. If there had been an explosion or "meltdown" at Three Mile Island, what affect would that have had upon the spent fuel pool? To what extent would it have mattered how much fuel was present at the pool?
3. If an accident such as the one at Three Mile Island occurred at Salem, to what extent would the accident affect the spent fuel pool? If an explosion or "meltdown" occurred at the Salem Station, to what extent would it have mattered how much fuel was present at the pool at the Salem Station?

F 211

CONTENTIONS REGARDING THE ACCIDENT HAZARDS OF SPENT FUEL STORAGE AT THE SALEM NUCLEAR POWER PLANT SALEM, NEW JERSEY

BY:
RICHARD E. WEBB, Ph.D.
February 27, 1979

An Analysis of the Accident Hazards of Storing Highly Radioactive, Spent Fuel Rods in Spent Fuel Storage Pools at Nuclear Power Plants and at Other Off-Site, Storage Facilities; With Special Reference to the Zion Nuclear Power Plant near Chicago, Illinois (Pressurized Water Reactor)

by

Richard E. Webb, Ph.D.

April 3, 1979

I. Introduction

Nuclear power plants produce extremely large amounts of radioactive substances as a by-product of operation —- substances which emit harmful nuclear radiation and which must be absolutely confined to containers and prevented from escaping into the biosphere (the human environment), in order to avoid exposing humans and other life to high levels of radiation and the high risk of cancer and other diseases that would result. These substances are considered as nuclear waste that must be safely disposed of, except possibly the by-product plutonium, which is a nuclear fuel material that can be further used, but which is also a highly toxic radioactive substance. Even if plutonium were used to fuel nuclear power plants, however, a substantial residue of it would still remain in the waste material, thereby adding to the waste's toxicity. It was originally intended to dispose of high level radioactive waste by placing it deep underground, for isolation from the biosphere in special facilities called "geologic repositories". However, there presently exist no such facilities for permanently and safely disposing of nuclear waste; nor is there any assurance that such facilities will exist in the next twenty years, or ever will exist, due to technical problems of assuring isolation of the waste for the hundreds and tens of thousands of years that will be required for the material to decay to safe levels of radiation. As a consequence, high-level radioactive waste and plutonium is dangerously accumulating in storage pits at nuclear power plants and other places in the form of <u>spent fuel rods</u> (to be described shortly). These "spent fuel storage pits", though each is enclosed in a building, are creating an

Appendix 2

Rasmussen Report's Implicit Strontium-90 ~~rs~~ Release Figure for a Spent Fuel Storage Pool Accident: 2000 curies.

The Rasmussen Report estimates that 1.88×10^6 curies of "alkaline earths" radioactivity escapes one third of a core load of spent fuel which ~~a~~ has aged for 60 days, and that 1% of this radioactivity escapes the building (Ras. Rpt., app. I, p. 103-104). Alkaline earths consists of Barium-140, strontium-89, and strontium-90, with half lives of 12.8 days, 50.5 days, and 29 years, respectively. The NRC's environmental impact statement for spent fuel (NUREG-0404) tabulates the quantities of these substances per metric ton of spent fuel. At time of discharge from the reactor (p. G-11):

Ba-140 ---- 1.72×10^6 Ci/MTU

Sr-89 ---- 9.47×10^5 Ci/MTU

Sr-90 ---- 6.4×10^4 Ci/MTU.

The mass of fuel per assembly is .45 MTU (NUREG-0404, p. G-5); and one core contains 193 fuel assemblies; hence 1/3 of a core equals 65 assemblies. From these data one can calculate the release fraction of alkaline earths and then the ~~ref~~ release quantity of strontium-90. We can compute the release fraction (F_r) implicitly assumed in the Rasmussen's estimate from the following equation for radioactive decay:

$$F_r \times .45 \times 65 \times \left[1.72 \times 10^6 e^{-\frac{\ln 2 \cdot 60}{12.8}} + 9.47 \times 10^5 e^{-\frac{\ln 2 \cdot 60}{50.5}} + 6.4 \times 10^4 e^{-\frac{\ln 2 \cdot 60}{29 \times 365}}\right] = 1.9 \times 10$$

Solving for F_r, $F_r = .12$, or roughly 10%. Therefore, the asumed ~~st~~ assumed strontium-90 release from the storage pool building (assusmed a (assumed in the Ras. Report) is

$$6.4 \times 10^4 \text{ Ci/MTU} \times .45 \text{ MT/ossy} \times 65 \text{ ossy} \times 0.1 \times 0.01 = 1872 \text{ Ci},$$

or to 2000 curies

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

IN THE MATTER OF:	)	
	)	DOCKET NOS. 50-295
COMMONWEALTH EDISON COMPANY	)	50-304
(ZION STATION UNITS 1 & 2,)	)	

SPENT FUEL POOL REPACKING

TESTIMONY OF,

Marvin Resnikoff,
on behalf of the
State of Illinois -
Office of the Attorney General

DATED: May 30, 1979