UNITED STATES OF AMERICA

NUCLEAR REGULATORY COMMISSION

In the matter of CAROLINA POWER & LIGHT CO. Et al.)	Dockets 50-400
Shearon Harris Nuclear Power Plant, Units 1 and 2)	and 50-401 O.L.

13 May 1983

RICHARD WILSON RESPONSE TO
NRC STAFF INTEROGATORIES (3/18/83)

Answers to General Interogatories

1. No particular technical education or experience is required to point out the absence of analysis (Contentions Ia-e, Ig), or the absence of enough data to support (If 1-4, IV c) the validity of assumptions or conclusions. I am the chairman of the Quality Assurance Committee of my medical group (Contention III).

I have a familiarity with physical and biological sciences gained in undergraduate and medical schools and maintained through reading periodicals such as Science, Science News, and Technology Review. My formal education is as follows:

S.B. Massachusetts Institute of Technology 1972

S.M. Massachusetts Institute of Technology 1972

M.D. Harvard Medical School 1976

2. I object to this contention on the grounds that it is overly broad. I will include all relevent calculations and analysis in my responses to the specific interogatories.

3,4,5. I do not know how much chlorine will be emitted in the cooling tower drift. Therefore I cannot know the environmental impacts of the chlorine which will be emitted. I have alleged that adverse environmental effects may occur. I know of no test of historical data which can refute my contention. I believe the issue has not been adequately studied. Further analysis will be done after receiving Applicants responses to my interogatories.

6. The biosphere that might be affected by chlorine emitted in cooling tower drift consists of all plants and animals that would be exposed to the drift.

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7. My study has not progressed to this level of detail yet.

8. My analysis of this problem is at a preliminary stage. I have identified several chlorinated hydrocarbons which are among the EPA's so-called Priority Pollutants and which are present in cooling tower blowdown. See following table.

	CONCENTRATION (ug/l or ppb)		
	Source 1	Source 2	Source 3
CHEMICAL			
Benzene	1-15		
Chloroform	1-34		.5
1,2 Dichlorobenzene	1-20		
1,4 Dichlorobenzene	1-		
1,1 Dichloroethylene	1-2		
Methylene Chloride	3-10		
Trichlorofluromethane	1		
Bromoform	0-154		.1-3.7
Chlorodibromomethane	0-7		.3-8
Phenol	1-40		
Bis (2-ethylhexyl)Phthalate	0-262		
Dichlorobromomethane	2.6		.7-1
2,4,6 Trichlorophenol	35		.7
2,4 Dichlorophenol	0-8		
Pentachlorophenol	5		
Other Chlorinated phenols		.2	.1-.7

Source 1. Development Document for Effluent Limitations Guidelines and Standards and Pretreatment Standards for the Steam Electric Point Source Category. EPA-440/1-82/029 November 1982 pages 119-130

Source 2. Chlorination of Organics in Cooling Waters and Process Effluents. Jolley, Robert L, G.Jones, WW Pitt, J.Thompson in WATER CHLORINATION Environmental Impact and Health Effects R.L. Jolley(ed). 1978 page 127

Source 3. Organohalogens in chlorinated Cooling Waters Discharged from Nuclear Power Stations. Bean, R.M., D.C. Mann, D.A. Neitzel (Batelle Pacific Northwest Laboratory) unpublished data.

Because many of these compounds are volatile, they may be lost to the atmosphere while the water is circulating in the cooling towers. The maximum concentration of the compounds in the water may therefore be considerably higher than the concentration in the blowdown. 1,2,3 Because the drift is an aqueous aerosol, the initial concentrations of compounds should equal the concentrations in the recirculating waters. 4 I have not yet calculated the quantities of these compounds likely to be discharged into the atmosphere. The data in the literature does not specify power level or season or time of day.

1. Source 1 p 119-130
2. Source 3. Authors state in draft paper that chloroform, for example, reaches concentrations of 25 ug/l in circulating water but only .1-.5 ug/l in discharge water.
3. An Experimental Assessment of Halogenated Organics in Waters from Cooling Towers and once through Systems Jolley, R.L., W.W.Pitt, F.G.Taylor, S.J.Hartman, G.Jones, J.E.Thompson in Water Chlorination Environmental and Health Effects Vol. 2, Jolley, R.L., H. Gorcher, D. Hamilton Eds 1978 p700
4. Atmospheric Emissions from Electric Power Plant Cooling Systems Smith, J.A., J.C. Harper, B.C. DaRos (SRI International) (Unpublished data).

9,10,11. I have not analyzed quantitatively the amount of sulphuric acid that may be released. I have not analyzed the impacts on any biological entities of the release of sulfuric acids.

12. The ER mentions "other chemicals" which might be added to the cooling water. It does not specify what these chemicals might be. I have asked the Applicant to provide a list of these "other chemicals". I have also asked the Applicants for a list of chemicals such as herbicides which might be added to the reservoirs. Chemicals used for corrosion, scaling, and biofouling control will presumably be on this list. Many of these chemicals may contain one or more of the so-called 126 Priority Pollutants designed by the EPA. New effluent limitations exclude many of these Priority Pollutants from regulation,5 so their effects when dispersed in cooling tower drift must still be considered.

13, 14 I have not had time to investigate the toxicology of the Priority Pollutants. I assume the EPA has this documentation. I will try to perform a quantitative analysis of toxicity when the Applicant provides a list of additives.

5. Source 1 pages 265-268

15. The biosphere consists of all plants and animals that would be exposed to the drift or to compounds in the drift deposited on the ground.

16. I do not know what specific entities could be adversely affected.

17. I have not done this calculation. The ER does not provide enough data on the amount of water which might be pumped, the frequency of pumping, the models for mixing in the reservoir, or the amounts of make-up water needed in specific circumstances. I have asked the Applicants to provide this information.

18. I have found no compilation of this information. I believe it is the Applicants' responsibility to provide it.

19. I have not done this analysis yet.

20. There is no documentation of the comparison of rainfall in the Buckhorn Creek Watershed and the Middle Creek Watershed. The "synthesized" estimate of Buckhorn Creek flow (90cfs). based on Middle Creek estimates, differed from the measured flow for the period 1973-1977 (79cfs) by 12%. I have performed no further analysis.

21,22. I have no experience or training in soil mechanics or hydrology.

23. I do not know.

24, I do not know.

25. That is the only assumption I have questioned. I have requested that the Applicants produce documents which form the basis of their analysis. I will study the assumptions of these documents.

These responses are true and correct to the best of my information, knowledge and belief.

RWilson

Richard Wilson

UNITED STATES OF AMERICA

NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

In the Matter of	)	
CAROLINA POWER & LIGHT COMPANY AND NORTH CAROLINA EASTERN MUNICIPAL POWER AGENCY	)	Docket Nos. 50-400 OL 50-401 OL
(Shearon Harris Nuclear Power Plant, Units 1 and 2)	)	

AFFIDAVIT OF RICHARD WILSON

County of Wake)
)
State of North Carolina)

The information in the following documents was true and correct to the best of my information, knowledge, and belief at the time the documents were filed. I did not understand when they were filed that affirmation under oath was required.

1. Response to Applicants' Interogatories and Request for Production of Documents 3 March 1983.

2. Richard Wilson Response to Applicants' Interogatories and Request for Production of Documents (second set) 29 March 1983.

3. Richard Wilson Response to Applicants' Interogatories and Request for Production of Documents (third set) 5 April 1983.

Richard D Wilson
Richard Wilson

Sworn to and subscribed before me this 10 day of May, 1983.

Linda O. Horton
Notary Public

LINDA O. HORTON NOTARY PUBLIC WAKE COUNTY, N. C.

My commission expires Nov 13, 1984

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