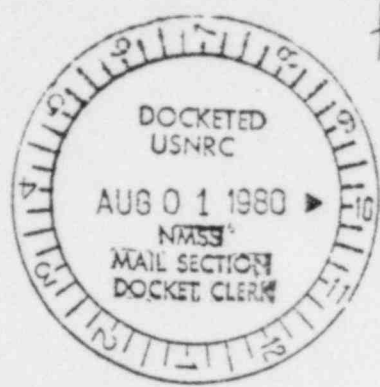


PDR

70-1113



July 21, 1980

Dr. E.Y. Shum  
Office of Nuclear Material Safety  
and Safeguards  
Nuclear Regulatory Commission  
Washington, D.C. 20555

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Subject: Environmental Impact Assessment for General Electric  
Nuclear Facility Modifications, Wilmington, North Carolina

- References:
- (1) General Electric Amendment N-2 to License SNM-1097, Docket Number 70-1113, 21 December 1979.
  - (2) General Electric Amendment N-4/S-15 to License SNM-1097 Docket Number 70-1113, 27 December 1979.
  - (3) Environmental Report, General Electric Nuclear Facility, Wilmington, North Carolina, NEDO-20197, January 1974.

Dear Dr. Shum:

Science Applications, Inc. (SAI) is to prepare an Environmental Impact Assessment (EIA) for two modifications proposed by General Electric for the fuel fabrication plant in Wilmington, North Carolina. The first of these modifications is the addition of two process lines which would increase the plant UF<sub>6</sub> to UO<sub>2</sub> conversion capacity by about 40%. The second is the construction of a waste incinerator of modern design to replace the incinerator facility previously approved by NRC on May 14, 1971. We propose to prepare a single EIA document for the two plant modifications. The detailed environmental changes associated with the plant modifications will be clearly specified such that the environmental effects of each of the modifications can be assessed separately.

General Electric has applied for authorization to expand the conversion facility in Reference 1 and to replace the incinerator facility in Reference 2. Each of these referenced applications was supported by information contained in an appropriate appendix.

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**FEE EXEMPT**  
*add wife*

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Science Applications, Inc. 7946 Ivanhoe Avenue, P.O. Box 1454, La Jolla, CA 92038, (714) 454-3811

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We have reviewed the referenced Amendments submitted by General Electric in detail, and have found several areas that require further clarification. The underlying data concerning the environmental impacts for the Wilmington Plant were contained in Reference 3. Since this document was prepared, several of the criteria and environmental concerns necessary to support an environmental report have been altered, and consequently we have found that additional information is necessary.

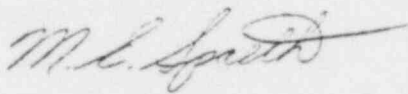
We have prepared questions for your office to forward to General Electric, Wilmington. The first series of 20 questions refer to the conversion facility amendment N-2 and Attachment 1. These questions are noted as 1.1 to 1.20 in Enclosure 1. The second series of 10 questions refer to the incinerator facility N-4/S-15 and its attachment. These questions are noted as 2.1 to 2.10 in Enclosure 2. The third series of 13 questions refer to document NEDO-20197, January, 1974 and are designated 3.1 to 3.13 in Enclosure 3. In each series of questions, the section and the page number are given for reference. You, of course, may elect to edit these questions before submitting them to General Electric.

As discussed on July 11, 1980 and confirmed with you on July 15, 1980, Mr. S.E. Donelson and myself will visit the General Electric Wilmington Plant August 11 and 12, 1980. The objective of the visit will be to gain additional insight into planned plant modifications and to obtain first hand knowledge of the plant operations that will assist us in preparing the EIA. We also tentatively plan to visit the regional offices of the EPA, and the office of the North Carolina Department of Water and Air Resources as these are the primary Agencies with responsibilities for the environmental effects that may arise from the Wilmington Plant operations. Although several other agencies are and may become concerned with the environment in the

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plant area relative to these plant modifications, we do not feel it is necessary to visit these agencies in person. We may request information from additional agencies as the work proceeds either by letter or by telephone. If this should become necessary, we will keep both you and G.E. informed prior to any contacts.

Sincerely,



M.E. Spaeth  
Principal Investigator

MES/idd

cc: S.E. Donelson  
R.W. Starostecki, SAI McLean

Enclosures: (1) Questions on Conversion Plant Expansion (Reference 1)  
(2) Questions on Incinerator Replacement (Reference 2)  
(3) Questions on Environmental Report (Reference 3)

## ENCLOSURE 1

### QUESTIONS ON CONVERSION PLANT EXPANSION (Reference 1)

#### 1.1 AMENDMENT LETTER, PAGE 1

To make a statement of negative declaration in the EIA, the proposed action must be necessary and no other action more attractive. The letter states that the addition "would increase the conversion capacity by 40%". In NEDO-20197 (page 4-42), it is stated that the "Wilmington plant can supply the annual feed requirements for more than a hundred 1000/MWe light-water reactors". Can an additional statement be provided that clearly demonstrates the present need for the plant expansion?

#### 1.2 ATTACHMENT 1, PAGES 2 AND 3

In NRC NUREG-1.109 it is stated that the radiological effects of plant operations be assessed for the population residing in an area within a 50 mile radius of the plant. Can a population distribution be provided for this area? Can the analysis presented in NEDO-20917 for the population within a 5 mile radius (page 4-2-1) be extended to the population within a 50 mile radius?

#### 1.3 ATTACHMENT 1, PAGES 2 AND 3

Can the population figures for the plant environs be updated to the late 1970's (or 1980) and expected growth extended to 1985-1990?

#### 1.4 ATTACHMENT 1, PAGE 12

It is mentioned that a cooling tower and 200-ton water chiller will be installed. Will these units occupy any of the previous open land on the site or will they be located in areas in which construction has already occurred?

1.5 ATTACHMENT 1, PAGE 13

Hydrogen for the conversion reactor and the defluorinator is supplied from a dissociated ammonia (DA) system. Where is this unit located and what provisions are made to avoid hydrogen fires or explosions in the production unit and the hydrogen distribution system?

1.6 ATTACHMENT 1, PAGE 16

What provisions are made to ensure that hydrogen cannot pass through the converter reactor, particularly under upset conditions?

1.7 ATTACHMENT 1, PAGE 16

What is the fate of the small amount (0.001%) of the  $U_3O_8$  and  $UO_2F_2$  powders that pass through the primary filter?

1.8 ATTACHMENT 1, PAGES 16 AND 17

Is the  $UF_6$  introduced to the conversion reactor completely reacted under upset conditions? Is uranium carried on occasion into the vacuum system scrubber?

1.9 ATTACHMENT, PAGES 16 AND 17

What provisions are made to ensure that unreacted hydrogen from dissociated ammonia is not discharged to the offgas from the defluorinator?

1.10 ATTACHMENT 1, PAGE 17

Are the gas streams from the defluorinator, the primary filter and the vacuum system combined into a single stream?

1.71 ATTACHMENT 1, PAGES 13, 16, 17

Can a block flow diagram showing the flow of uranium and other chemical reactants be provided? A diagram would be of great benefit in clarifying the routing of process streams.

1.12 ATTACHMENT 1, PAGE 18

The enrichment stated in Section 3.3.1 is phrased awkwardly. Can this statement be clarified?

1.13 ATTACHMENT 1, PAGE 24

The statement that "the dry conversion process does offer an environmental advantage due to the lower volume of liquid wastes generated per unit weight of uranium hexafluoride converted" does not seem to be substantiated by the data given in the table in Section 6.5. The projected volume in the table is 50% greater than the initial volume (1.8 MGPD vs 1.2 MGPD) and the plant throughput increase is given as 40%. Can this be clarified?

1.14 ATTACHMENT 1, PAGE 27

Is the data given in the table in Section 6.5 for fluoride and nitrogen correct? With the plant throughput increased by 40%, why are the releases of fluorides increased by a factor of 2.7 and nitrogen releases by a factor of two?

1.15 ATTACHMENT 1, PAGES 29 and 30

In relation to the data given in Section 6.7, with a 50% increase in plant releases to the river, it would be expected that the concentrations of copper, nickel and chromium, would be affected to some degree as the total quantities of these materials is expected to remain constant. Can this point be clarified?

1.16 ATTACHMENT 1, PAGES 29 AND 30

Are the "present" values given in the table in Section 6.7 based on the measurements made for these contaminants?

1.17 ATTACHMENT 1, PAGE 30

What are the units for the activity concentration at the site boundary for discharges to the atmosphere?

1.18 ATTACHMENT 1, PAGE 31

The pH of the discharge is apparently corrected from a pH greater than 10 to a pH in the 6-9 range. What is the agent used for pH adjustment and what is its concentration (Table, Section 6.7) when it enters the river?

1.19 ATTACHMENT 1, PAGE 32

Calculations have been made regarding the radiation exposure of an infant living in the vicinity of the facility. Can the details of the calculational methods used and the assumptions made for the exposure estimates be provided?

1.20 GENERAL

Will the addition to the conversion facilities cause any change in the number of personnel at the Wilmington plant?

ENCLOSURE 2

QUESTIONS ON INCINERATOR REPLACEMENT (Reference 2)

2.1 ATTACHMENT, PAGE 1

Over what period is the quantity of combustible waste generated?

2.2 ATTACHMENT, PAGES 1 AND 2

The dimensions for the wastes boxes are given as 4 x 4 x 4 ft., or 64 cubic feet. The volume of a box is given in the table as 60 cubic feet. Which value is correct?

2.3 ATTACHMENT, PAGE 2, ITEM 8

The quantity of boxes indicated to have been accumulated in one year is 600. The production data on page 1 is based on 400 boxes. Can this point be clarified?

2.4 ATTACHMENT, PAGE 8

It is stated in Section 3.1 that "no organics" will be incinerated, however "paper, wood, plastics" are organics. Can this point be clarified?

2.5 ATTACHMENT, PAGE 8 AND FIGURE 3

The process flow diagram shows a heat recovery unit in the offgas stream, however, no mention of this unit is made in the process description on page 8. Can this point be clarified?

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2.6 ATTACHMENT, FIGURE 3

There are no flame sensors or flame control devices for the incinerator or the afterburner indicated on the diagram. What provisions are made to insure that unburned natural gas or propane will not enter the remainder of the system?

2.7 ATTACHMENT, PAGE 8

It is stated in Section 3.2 that "The scrubbing efficiency will be 99.5% of the entering HCl,  $\text{NH}_4\text{F}$  and  $\text{HNO}_3$ ". With the wide variability in contaminants in "as is" waste (page 2), how can this criteria be satisfied?

2.8 ATTACHMENT, PAGE 8

It is stated in Section 3.2 that "stack emissions level will be continuously monitored to measure activity levels in the gaseous effluent". How will the levels of other contaminants, F, Cl, and  $\text{NO}_x$  in the offgas stream be determined?

2.9 ATTACHMENT, PAGE 14

Are the air emission quantities given in Section 6.2 to be added to those given on page 28 of Attachment 1 for the Wilmington plant?

2.10 GENERAL

Will the operation of the incinerator cause any change in the staffing levels for the Wilmington plant?

ENCLOSURE 3

QUESTIONS ON ENVIRONMENTAL REPORT (Reference 3)

NOTE: These questions arise primarily because of the changes in environmental concerns that have occurred and by the necessity to update the data since the report was prepared in 1974.

3.1 PAGE 1-23

Will the new incinerator stack be visible from off-site locations?

3.2 PAGE 1-24, TABLE 1-2

Have the energy requirements differed from the projections for years 1973 - 1978?

3.3 PAGES 1-24 AND 1-25

Will the expansion of the conversion facility and the replacement of the incinerator cause a change in energy or water requirements per unit of production?

3.4 PAGE 1-25

Has the plant continued to operate in a safe manner since 1974?

3.5 PAGE 2-1 (1st Paragraph)

Has there been any significant change in the land use patterns in the region around the site since 1974?

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3.6 PAGE 2-17

Have there been any significant changes in the North Carolina Water Quality Standards or in the designation for the Northeast Cape Fear River since 1974?

3.7 PAGE 2-17

Have there been any significant changes in the EPA requirements or standards that may affect the National Pollutant Discharge Elimination System Discharge Permit NC 0001228?

3.8 PAGE 4-3

Ground water samples are taken from the vicinity of the calcium fluoride pits on a periodic basis. Do the analytical results continue to show no increase in fluoride?

3.9 PAGE 4-5 AND TABLES 4-1 AND 4-2

Will the planned modifications to the conversion process or the incinerator cause any significant changes in the storage quantities or locations of chemicals used on-site?

3.10 PAGE 4-5 AND TABLE 4-3

Are the quantities of contaminants listed in Table 4-3 based on measured or calculated values?

3.11 PAGE 4-40 AND TABLE 4-41

Will the planned modifications to the conversion process or the incinerator cause any significant changes in the resource commitments listed in Table 4-26?

3.12 PAGE 5-16

The analysis of the amount of radioactivity during a criticality excursion was based on  $10^{18}$  fissions with the accident lasting one second. The regulatory position as given in NUREG 3.34 is that an excursion is assumed to occur in a vented vessel and multiple excursions occur with bursts lasting 0.5 seconds at intervals of 10 minutes for a period of 8 hours. A total of  $1 \times 10^{19}$  fissions occur during the excursions. Can the criticality analysis given on pages 5-16 to 5-18 be extended to cover the conditions set forth in NUREG 3.34?

3.13 PAGE 6-3 AND TABLE 6-1

Can the information given in Table 6-1 be extended to include the latest available data on water impurities?