November 4, 1998

Dr. Carl A. Paperiello, Director
Office of Nuclear Material Safety and Safeguards
U.S. Nuclear Regulatory Commission
Two White Flint Center
Washington, D.C. 20555-0001

REFERENCE:10 CFR Part 70 Regulation of Chemical Hazards

Dear Dr. Paperiello:

At the September 29th *NRC-Nuclear Industry Workshop on Part 70 Regulation* you acknowledged that the language in the draft Part 70 revisions addressing regulation of hazardous chemicals required clarification. You requested the Nuclear Energy Institute (NEI)[1] to propose corrections to this draft language.

Attachment 1 to this letter presents the changes that NEI recommends be incorporated to accurately reflect NRC's regulatory jurisdiction over hazardous chemicals. Attachment 2 provides background information and explanations for each recommended change. Attachment 3 is a red-lined version of SECY-98-185 which incorporates NEI's recommended changes.

[1] NEI is the organization responsible for establishing unified nuclear industry policy on matters affecting the nuclear energy industry, including the regulatory aspects of generic operational and technical issues. NEI's members include all utilities licensed to operate commercial nuclear power plants in the United States, nuclear plant designers, major architect/engineering firms, fuel fabrication facilities, materials licensees, and other organizations and individuals involved in the nuclear energy industry.

NEI is pleased to have had the opportunity to provide this input to the NRC towards clarifying the draft rule language. We look forward to continuing the dialogue on the Part 70 rulemaking and to addressing any questions which you or your staff may have on the industry's concerns and positions.

Sincerely,

Marvin S. Fertel

cc: Chairman Shirley Ann Jackson
Commissioner Edward McGaffigan, Jr.
Commissioner Nils J. Diaz
Commissioner Jeffrey S. Merrifield
Commissioner Greta Joy Dicus
William D. Travers, Emeritus Director of Operations

bc: Joe Colvin
Ralph Beedle
Angie Howard
Robert Bishop
Facility Operation Steering Committee

ATTACHMENT 1

NUCLEAR ENERGY INSTITUTE (NEI)
RECOMMENDED LANGUAGE CHANGES TO PART 70
FOR REGULATION OF CHEMICAL HAZARDS

I. Deficiencies in Draft Language

Proposed revisions to 10 CFR Part 70 will provide NRC regulatory jurisdiction over all "*chemical hazards resulting from the processing of licensed*" radioactive material. The breadth of this jurisdiction exceeds that described in SECY-98-185 and in the 1988 NRC/OSHA Memorandum of Understanding (MOU). Proposed language in Part 70 can be construed to extend NRC regulation to *any* chemical hazard at a licensed fuel fabrication facility. NEI's principal objection to the draft Part 70 language is its failure to clearly separate the regulatory responsibilities of the NRC and OSHA as established in the MOU. As written, the draft rule will result in redundant, overlapping regulatory oversight that will not improve public or worker health and safety.

II. Proposed Language Modifications

The draft language can be corrected primarily through clarification of the term "*hazardous chemicals*" in Part 70.60 and addition of a new definition for "*hazardous chemicals produced from radioactive materials*."

The MOU grants NRC the responsibility of protecting against "*chemical risk produced by radioactive materials.*" Chemical risk results from hazards posed by either (i) the radioactive material itself, or (ii) compounds created by reaction of the radioactive materials with other substances. To clarify NRC jurisdiction over these two chemical hazards the following changes are recommended:

(i) the term "*hazardous chemicals*" should be replaced by "***radioactive materials or hazardous chemicals produced from radioactive materials***" This change would apply to §70.60(b)(1)(ii)(B), §70.60(b)(1)(iii)(c), §70.60(b)(2)(i)(B) and §70.60(b)(2)(ii)(B) of the draft rule and throughout SECY-98-185.

(ii) the majority of the chemicals listed in Appendices A (AEGLs) and B (ERPGs) are non-radioactive, are not used in SNM processing and are not capable of being produced from radioactive materials. The proposed Rule revisions could be simplified by retaining references to the AEGL and ERPG standards, but deleting the actual tables of exposure limits which will be continually updated and modified.

(iii) the definition of "*Hazardous Chemicals"* includes the phrase "…cause significant damage to property or…" The NRC should not attempt to exercise jurisdiction over damage to property because such damage is not related to public health and safety. This clause should be deleted. The definition should, therefore, read as follows:

> "Hazardous Chemicals means substances that are toxic, explosive, flammable, corrosive or reactive to the extent that they can endanger life if not adequately controlled."

(iv) inclusion of a definition for "***Hazardous Chemicals Produced from Radioactive Materials***" is required. This definition will reinforce the clear distinction between chemicals whose hazards are to be regulated by the NRC or by OSHA. Chemical hazards which could produce radiological consequences of concern are already regulated by the NRC. The new definition should build upon the existing definition of Hazardous Chemicals and should read:

> "Hazardous Chemicals Produced from Radioactive Materials means Hazardous Chemicals either having radioactive material(s) as precursor compound(s) or formed through interaction with radioactive materials. They do not include chemicals merely added to, or used in, or recycled from, the processing of special nuclear material (SNM)."

III. Concluding Remarks

The foregoing suggested changes more accurately reflect the language and intent of the NRC/OSHA MOU and more clearly demarcate the regulatory responsibilities of the NRC and OSHA with respect to chemical safety. Adoption of these suggested changes will provide clarity of the areas over which the NRC has authority to regulate the chemical hazards of radioactive materials without engaging in the regulation of purely chemical hazards.

ATTACHMENT 2

NUCLEAR ENERGY INSTITUTE (NEI)
BACKGROUND INFORMATION ON
RECOMMENDED LANGUAGE CHANGES TO PART 70
FOR REGULATION OF CHEMICAL HAZARDS

I. Introduction

The U.S. Nuclear Regulatory Commission (NRC) issued SECY-98-185, "*Proposed Rulemaking - Revised Requirements for the Domestic Licensing of Special Nuclear Material*" on July 30, 1998 to obtain Commission approval to publish a proposed rule amending 10 CFR Part 70. One proposed amendment addresses chemical safety standards. This amendment would extend NRC regulatory jurisdiction to all "*chemical hazards resulting from the processing of licensed*" radioactive material, a much broader scope than was originally mandated in the rulemaking.

The chemical safety standard amendment (§70.60) should reflect the separation of regulatory jurisdiction of hazardous chemicals between the Occupational Health and Safety Administration (OSHA) and the NRC as detailed in the "*Memorandum of Understanding Between the Nuclear Regulatory Commission and the Occupational Safety and Health Administration; Worker Protection at NRC-Licensed Facilities*," 53 Fed. Reg. 43950 (Oct. 31, 1988) (NRC/OSHA MOU). The draft rule, however, extends NRC regulatory oversight to eighty-eight chemicals, a majority of which are neither used in fuel cycle operations nor pose radiation hazards to facility workers or the public. The proposed §70.60 specifies concentrations of these chemicals, exposure to which constitutes a "consequence of concern," necessitates assessment in the licensee's Integrated Safety Analysis (ISA) and requires design and implementation of adequate safety measures. Language in the draft rule can be construed to appreciably broaden the scope of NRC authority into areas reserved for OSHA regulatory oversight.

At the September 29th *NRC-Nuclear Industry Workshop on Part 70 Regulation* the NRC concurred that the chemical safety rule amendment should conform to the NRC/OSHA MOU and that the NRC should only regulate those hazards falling within its jurisdiction. The NRC requested NEI to offer suggestions to clarify the language of the draft rule to ensure that the regulatory authority of the NRC and OSHA is clearly demarcated.

This Attachment 2 summarizes NEI's understanding of the scope of the NRC's authority to regulate chemical hazards at fuel-cycle facilities and explains the basis for each change in the draft Rule language presented in Attachment 1.

II. NRC Authority to Regulate Chemical Hazards

The NRC/OSHA MOU identifies "four kinds of hazards that may be associated with NRC-licensed nuclear facilities":

1. "Radiation risk produced by radioactive materials;"

2. "Chemical risk produced by radioactive materials;"

3. "Plant conditions which affect the safety of radioactive materials and thus present an increased radiation risk to workers. For example, these might produce a fire or an explosion, and thereby cause a release of radioactive materials or an unsafe reactor condition; and,"

4. "Plant conditions which result in an occupational risk, but do not affect the safety of licensed radioactive materials. For example, there might be exposure to toxic non-radioactive materials and other industrial hazards in the workplace."

The NRC/OSHA MOU states that the NRC shall have the responsibility for protecting against the first three hazards, while OSHA shall be responsible for protecting workers from the fourth hazard.

NRC's sole responsibility for protecting the health and safety of the public from the first hazard (radiation risk) is clear and unambiguous.

NRC's responsibility with respect to the second hazard is limited to a narrow class of chemical hazards. "Consequences of concern" which the NRC is responsible for regulating are chemical hazards which either: (1) result from the hazardous properties of the radioactive material itself, or (2) are created by the chemical reaction of the radioactive material and one or more other substances. For example, radioactive compounds UF_6 and UF_4 exhibit toxic properties whose hazards are subject to NRC regulation. The NRC would also regulate generation of HF formed through interaction of UF_6 and moisture (humidity) in the conversion process to ensure that any exposures are kept below ERPG threshold concentrations. NRC regulatory oversight would not, however, extend to an HF

recovery circuit once the HF off-gas scrubber condensates leave the conversion plant and are confirmed to contain only residual concentrations of radionuclides. Protection of workers from HF chemical hazards at that point in the HF plant would, instead, revert to OSHA jurisdiction. Acids, ion exchange eluants and solvent extraction organic chemicals used in UO_2 scrap recovery would also be subject to NRC regulatory oversight only when actually used in uranium recovery processing and regeneration; regulation of chemical hazards from their bulk storage and handling (prior to use or after regeneration) would be an OSHA responsibility.

Determination of whether or not a particular chemical should be regulated by the NRC is often a process-specific issue. For example, nitric acid to be used in the UO_2 scrap recovery process may be stored on site prior to use and would not be regulated by the NRC (so long as it could not affect the safety of licensed material). However, once the acid is used in the dissolution process and combines with UO_2, the radiological and chemical hazards of the mixture would be subject to NRC regulation. On the other hand, once the UO_2 is stripped from the acid (via ion or solvent exchange) to leave the acid sufficiently free of radiological contamination to permit its handling as a non-radioactive material, the acid would only be subject to NRC regulation if it was stored or used in a manner that could affect the safety of licensed material. Off-gas scrubber condensates of gaseous and volatile radionuclides may be subject to NRC oversight depending upon their composition and upon the radiation hazard they pose. Licensees will need to evaluate their own processes and chemical inventories to determine the relevant controls that should apply to a particular chemical at various stages in their manufacturing processes. In summary, NRC regulatory authority over chemical hazards extends only to those chemicals stored at a licensed fuel facility that may affect the safety of SNM.

NRC's responsibility with respect to the third hazard entails protecting workers against increased radiation risk caused by plant conditions affecting the safety of radioactive material. Radiation releases could originate directly from fires or explosions or indirectly from releases of hazardous, non-radioactive substances that might incapacitate an essential plant operator who would then be unable to respond to an emergency and prevent a release of radiation. In all cases the consequence of concern to the NRC is the increased radiation risk to the worker -- <u>not</u> the occupational risk of the precursor fire, explosion or chemical release event. It is this radiation risk that should be of concern to the NRC. The occupational risks associated with the precursor events are the responsibility of OSHA.

With respect to the fourth hazard, OSHA retains the responsibility for ensuring the occupational safety of workers including their protection from unacceptable exposures to toxic, non-radioactive chemicals and other industrial hazards. In this

case the consequence of concern is the (non-radiation) risk associated with a particular plant condition.

III. Prior NRC Guidance on Chemical Hazards

NUREG-1601 (*Chemical Process Safety at Fuel Cycle Facilities*) provides guidance for licensees to address chemical safety issues. In accordance with the MOU, it acknowledges that the NRC's responsibility is assurance of the safety of licensed material and that its oversight of the risk posed by hazardous chemicals is limited to their effect on licensed material and increased radiation risk to workers:

> "*Most NRC fuel cycle licensees possess materials that are chemically hazardous and/or pose some sort of non-radiological risk. Chemical and radiological risks have been known to compound one another, and in many cases, radioactive materials are also chemically hazardous. A chemical explosion in a fuel cycle facility could disperse radioactive material, just as the radiation environment could make it more difficult to respond to a hazardous chemical spill. . . . The MOU between NRC and OSHA on chemical safety issues makes provision for the NRC to assume responsibility for the control of risks which may affect radioactive materials*. (NUREG-1601, § 2)

NUREG-1601 goes on to state that:

> *"Thus the NRC does not regulate chemicals per se; rather, the NRC verifies that the interactions of chemicals with NRC-licensed nuclear materials and/or with equipment which processes, transports, or stores these licensed materials have been considered in the design of the equipment and facilities and in the operating and maintenance procedures*."
> (NUREG-1601, §2).

NUREG-1601 instructs licensees to conduct hazard audits to identify:

> *"potential chemical hazards of radioactive materials and radiation hazards caused by chemicals . . . .* "
> (NUREG-1601, §2.2.1).

Although it advises licensees to identify non-radioactive chemicals, it does so in order to ensure the safety of licensed material:

> *"Chemicals which do not contain licensed materials should also be identified as potential chemical hazards because . . . release of such chemicals may affect the process by releasing the licensed material or may affect the confinement of the licensed material in a favorable geometry".* (NUREG-1601, §2.3.1.1 emphasis added).

With regard to the effect of chemical hazards on the environment, the NRC emphasizes that a licensee need only identify those:

> *"[c]hemicals which can cause a release of licensed material to the environment above NRC-prescribed limits…"*
> (NUREG-1601, §2.3.1.2).

IV. NEI Recommended Changes to Part 70

The chemical safety standard amendment in §70.60 should be rewritten to clarify NRC's regulatory jurisdiction over chemical risks posed by:

(1) Special Nuclear Material (SNM)
(2) radioactive compounds (e.g. UF_6)
(3) radioactive compounds produced from radioactive materials during the processing of SNM (e.g. HF)

NRC jurisdiction shall not extend to chemical risks originating from non-radioactive reagents stored at a fuel fabrication facility, either prior to their use or following their regeneration, and to non-radioactive by-product chemicals produced in the fuel fabrication operation.

To clarify the separate regulatory jurisdictions of the NRC and OSHA over chemical hazards, the following language changes are recommended:

(i) Definition of "*Hazardous Chemicals*"

The MOU grants NRC the responsibility of protecting against "*chemical risk produced by radioactive materials.*" Chemical risk results from hazards posed by (i) the radioactive material itself (e.g. UF_6), (ii) compounds created by reaction of the radioactive materials with other substances (e.g. HF) or (iii) compounds contaminated by SNM or radioactive chemicals (e.g. HNO_3, TCE, $NaCO_3$). Chemicals produced by reaction with, or contaminated by, SNM (instances (ii) or (iii) above) are subject to NRC authority. Once, however, they are sufficiently free of radiological contamination to permit handing as a non-radioactive

material they would no longer be subject to NRC oversight. All chemicals used in the facility, whether or not they are radioactive or hazardous, could fall under NRC jurisdication if they in any way impacted the safety of licensed material. To clarify NRC jurisdiction over these two chemical hazards the following changes are required, the term "*hazardous chemicals*" should be replaced by "***radioactive materials or hazardous chemicals produced from radioactive materials***" This change would apply to §70.60(b)(1)(ii)(B), §70.60(b)(1)(iii)(c), §70.60(b)(2)(i)(B) and §70.60(b)(2)(ii)(B) and throughout SECY-98-185.

- §70.60(b)(1)(ii)(B):
  "Radioactive materials or hazardous chemicals produced from radioactive materials in concentrations exceeding AEGL-3 (Appendix A) or ERPG-3 (Appendix B) criteria; or"
- §70.60(b)(1)(iii)(C):
  "Radioactive materials or hazardous chemicals produced from radioactive materials in concentrations exceeding AEGL-2 (Appendix A) or ERPG-2 (Appendix B) criteria; or"
- §70.60(b)(2)(i)(B):
  "Radioactive materials or hazardous chemicals produced from radioactive materials in concentrations between AEGL-2 (Appendix A) or ERPG-2 (Appendix B) criteria and AEGL-3 (Appendix A) or ERPG-3 (Appendix B) criteria; or"
- §70.60(b)(2)(ii)(B):
  "Radioactive materials or hazardous chemicals produced from radioactive materials in concentrations between AEGL-1 (Appendix A) or ERPG-1 (Appendix B) criteria and AEGL-2 (Appendix A) or ERPG-2 (Appendix B) criteria; or"

As a result of these proposed changes, a licensee would need to provide reasonable assurance that:

(i) concentrations of those radioactive materials listed in the AEGLs or ERPGs will not exceed the relevant consequences of concern, and that

(ii) concentrations of hazardous chemicals listed in the AEGLs or ERPGs that may be produced through interactions with radioactive materials will not exceed the relevant consequences of concern.

(ii) ***Deletion of Appendices A and B***

A majority of the chemicals listed in Appendices A (AEGLs) and B (ERPGs) are non-radioactive, are not used in SNM processing and are not capable of being produced from radioactive materials. The proposed Rule revisions would be simplified by retaining references to the AEGL and ERPG standards, but deleting the actual tables of exposure limits which will be continually updated and

modified. If the Appendices are not deleted, each should include the following statement:

> *"The values listed should only be used as a consequence of concern if the chemical in question is radioactive, or is produced from radioactive material at a particular facility."*

(iii) ***Reference to Property Damage***

The definition of *"Hazardous Chemicals"* includes the phrase "…cause significant damage to property or…" The NRC should not attempt to exercise jurisdiction over damage to property because such damage is not related to public health and safety. This clause should be deleted. The definition shall, therefore, read as follows:

> "Hazardous Chemicals means substances that are toxic, explosive, flammable, corrosive or reactive to the extent that they can endanger life if not adequately controlled."

(iv) "***Hazardous Chemicals Produced from Radioactive Materials***"

Definition of an additional term – Hazardous Chemicals Produced from Radioactive Materials – should be added to reinforce the clear distinction between chemicals whose hazards are to be regulated by the NRC and those to be solely regulated by OSHA. Chemical hazards which could produce radiological consequences of concern are already regulated by the NRC. The new definition should build upon the existing definition of Hazardous Chemicals and should read:

> "Hazardous Chemicals Produced from Radioactive Materials means Hazardous Chemicals either having radioactive material(s) as precursor compound(s) or formed through interaction with radioactive materials. They do not include chemicals merely added to, or used in, or recycled from, the processing of special nuclear material (SNM)."

Ref: I:\files\Part 70\Chemical Comments (MLB)(13-10-98)