

April 5, 2004 (3:36PM)

**UNITED STATES OF AMERICA  
NUCLEAR REGULATORY COMMISSION  
ATOMIC SAFETY AND LICENSING BOARD PANEL**

OFFICE OF SECRETARY  
RULEMAKINGS AND  
ADJUDICATIONS STAFF

**Before Administrative Judges:**  
**Michael C. Farrar, Presiding Officer**  
**Charles N. Kelber, Special Assistant**

**In the Matter of  
CFC Logistics, Inc.**

**Docket No. 03036239**  
**ASLBP No. 03-814-01-ML**

## Materials License

Date: April 2, 2004

## INTERVENORS' REPLY TO RESPONSES OF NRC STAFF AND CFC LOGISTICS REGARDING STAFF QUESTIONS AND PENDING MOTIONS

Pursuant to 10 C.F.R. §§ 1263 and 2.788, Intervenors hereby request the Atomic Safety and Licensing Board (“ASLB”) to stay the issuance of a license to CFC Logistics, Inc., for a cobalt-60 irradiator in Milford Township, Pennsylvania. Herein, Intervenors expand upon their reasons established in the Renewed Motion for Stay dated November 10, 2003 and support their filing with the 3<sup>rd</sup> Declaration of Dr. Marvin Resnikoff, Ph.D. dated March 17, 2004 (Exhibit A).

## I. PROCEDURAL HISTORY

The Intervenor<sup>1</sup> hereby reply to briefs filed by NRC Staff on February 27, 2004 (“Staff Brief”) and CFC Logistics on March 5, 2004 (“CFC Brief”). The Staff and CFC Briefs contain responses to a Prehearing Order (Regarding NRC Staff Participation and Other Matters) issued by the Presiding Officer on February 17, 2004. The Presiding Officer directed the NRC Staff

<sup>1</sup> The Intervenor currently include 32 residents of Milford Township, Pennsylvania. Seven individuals were added to the Intervenor list in the *Petition for Leave to Intervene*, dated December 4, 2003, filed in response to the *Notice of Hearing and of Opportunity to Petition for Leave to Intervene*. That Notice was posted in the *Federal Register* on

(Staff) to furnish its views on the Intervenor's "Renewed Motion for Stay" (Renewed Stay Motion) dated November 10, 2003 and their "Request for Reference to Commission" dated December 1, 2003 (Reference Request). The Stay Motion renews two prior Motions for a Stay of the issuance of the materials license granted to CFC Logistics, Inc. ("CFC"). The license currently authorizes CFC to use one million curies of cobalt-60 to operate a nuclear food irradiator ("irradiator") located adjacent to the Quakertown interchange of I-476. The Reference Request seeks certain essential design drawings and correspondence between CFC and its suppliers, Gray\*Star, Inc. ("Gray\*Star") and REVISS Services Ltd. ("REVISS") not included in CFC's license application file.

In his order dated February 17, the Presiding Officer also requested the Staff to answer specific questions contained in the Appendix to the Prehearing Order, on pp. 7-9. These questions were culled from suggestions submitted by the Intervenor and CFC<sup>2</sup> at the request of the Presiding Officer. His request was made on December 11 during the prehearing conference held in Milford Township, Pennsylvania. The Staff opted not to participate in that proceeding pursuant to 10 C.F.R. § 2.1213.<sup>3</sup>

On Thursday, March 11, Intervenor filed a Motion seeking a briefing extension from Friday, March 12 to Wednesday, March 17 for the response to Staff and CFC Briefs regarding the pending motions for a stay and related relief. Because of the unavailability of Intervenor's expert witness for much of the briefing period, as well as the indication by CFC that it had no objection to the extension, the Presiding Officer granted the Motion and issued an Order Extending Briefing Time on Monday, March 15, 2004.

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November 5, 2003. After becoming an original petitioner on June 23, 2003, Andrew Ford, whose previous address was 1730 Red Bud Road, sold his home and moved away.

<sup>2</sup> See Intervenor's *Questions to the Staff* dated December 15, 2003 and *Response of CFC Logistics, Inc. to Presiding Officer's Request* dated December 16, 2003.

Also on March 15, Intervenors filed a Motion to Release Filing from Protective Order, for Extension and Sanctions. The Motion resulted from the unexpectedly wide-ranging briefs, including extensive arguments and supporting materials, submitted by CFC on March 5 and March 12 in reply to the Staff briefs filed on February 27 and March 5. Further, Intervenors' Motion requested the lifting of a Protective Order, filed by CFC on September 12, 2003 and approved by the Presiding Officer, designed to keep certain documents out of the public view. These documents detail design reviews and underlying contractual discussions between CFC and its suppliers, Gray\*Star and REVISS. They characterize the design of the GENESIS I Category III irradiator as a "prototype," "developmental," and "experimental."

On March 16, the Presiding Officer suspended the briefing schedules on all pending matters until the matters addressed in Intervenors' March 15 Motion could be resolved. Further, he directed that counsel for CFC file a response by March 19 including procedures to be followed to (1) determine the validity of Intervenors' claim that "certain information is proprietary (or business confidential or trade secret); and (2) the authority, if any, that we have in the realm of 'sanctions' generally."<sup>4</sup> Counsel for all three parties, including the Staff, were directed to participate in a transcribed telephone conference call at 3:00 PM on Tuesday, March 23 regarding these matters.

In their response on March 19, counsel for CFC submitted a Status Update to the Presiding Officer stating that the Company had no objection to releasing its brief dated March 12, 2004 and related attachments from the protective order. CFC also indicated that it had no objection to allowing Intervenors a reasonable time extension to respond to the NRC Staff and CFC submissions.

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<sup>3</sup> See *Letter to Administrative Judges* dated November 21, 2003.

<sup>4</sup> See *March 16 Order (Regarding Intervenors' March 15 Motion)*

On March 22, counsel for CFC provided a Second Status Update Regarding the Presiding Officer's Order dated March 16, 2004. CFC indicated in the Update that it had obtained permission from REVISS to release the brief and all attachments comprising CFC's submission dated March 5 from the protective order. CFC asserted that, because "each of Interveners' concerns regarding the public availability of the aforementioned documents have been resolved,"<sup>5</sup> the Interveners' should withdraw their request for sanctions dated March 15 or, in the alternative, the Presiding Officer should deny the Interveners' request.

During the scheduled conference call on March 23, the Presiding Officer requested that counsel for the Interveners prepare a brief, due on April 2, containing an argument for authority and justification of sanctions. CFC will have an opportunity to respond thereafter. If Interveners' motion is successful, a discussion of punitive and compensatory monetary damages will follow. The Interveners' briefing schedule was discussed during the call and the Presiding Officer directed that all previously postponed briefs are now due on April 2, including this reply brief.

In their briefs dated February 27 and March 5, respectively, the Staff and CFC challenge the validity of several "serious concerns" raised by the Interveners and request that the Presiding Officer deny Interveners' Renewed Stay Motion. However, the arguments of the Staff and CFC are without merit, as discussed in Section II below.

## **II. ARGUMENT**

### **A. Prototypical differences exist between the GENESIS I irradiator designed by Gray\*Star and other Category III models previously licensed. These**

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<sup>5</sup> See CFC Logistics, Inc.'s *Second Status Update Regarding The Presiding Officer's March 16, 2004 Order* (dated March 22, 2004).

differences have serious and imminent consequences related to health and safety, not merely production efficiency.

Contrary to the contentions of NRC Staff and legal representatives for CFC Logistics, the contents of the sales agreement between CFC and Gray\*Star are indeed relevant. The startling language of the sales contract, detailed in Intervenor's Renewed Stay Motion, is indicative of the radically different, unproven, and risky nature of the design for the irradiator, licensed on August 27, 2003 and now operating in Milford Township, Bucks County. It is significant that this language was not included in the license application or considered by the Staff as part of that application, because the terms "prototype," "developmental," and "experimental" accurately describe the irradiator as a major leap – not a small, incremental step – away from previous Category III irradiator designs.

The Staff contend on page 3 of their response that the terms "prototype" and "experimental," used in the sales contract, do not fairly characterize the GENESIS I irradiator consistent with their dictionary definitions. Rather, the Staff and counsel for CFC describe novel structures and procedures surrounding the irradiator as "evolutionary" (*id.*).

The facts are at odds with this contention that, in any event, is not comforting. The GENESIS I irradiator is unique and revolutionary among Category III irradiators because in it radioactive sources, while stored and utilized under water, must be maintained within a dry space created within the plenum. Dry storage of the cobalt-60 sources creates unique characteristics that significantly increase the risk of mechanical failure of the Gray\*Star prototype in comparison to earlier models in the same category. These include:

- the necessity for operation of air pumps and air filtration devices not required in other Category III irradiators;
- insertion of a check valve at the base of the irradiator's plenum, intended to purge water from its interior but now viewed by Intervenor's technical expert<sup>6</sup> and REVISS engineers as a potential point of mechanical failure;
- the potential for leakage of small quantities of water onto the cladding of the sealed sources that could result in the production of live, corrosive steam capable of damaging the sources, plenum, filtration, and pumping devices. (While counsel to CFC has observed that sources are designed for use under water, the presence of thousands of gallons of water in direct contact with the sources serves as a heat sink in ordinary Category III irradiator designs. This is not the case for the GENESIS I, an experimental design which might allow small amounts of water to contact the cobalt-60 sources and then be converted to steam that could corrode the sources.) See 3<sup>rd</sup> Declaration of Marvin Resnikoff, Ph.D. in support of Petitioners' Motion for a Stay ("3<sup>rd</sup> Declaration").

The Staff response contends that "it is common for an application for an NRC license to contain some 'new' or 'unique' aspects...There is nothing inherent in an application having 'prototypical' aspects that prevents the applicant from meeting the NRC licensing requirements." The Staff concluded "that the application met NRC's licensing requirements and that the new design aspects did not represent a radiological health and safety issue." (*id.*, page 4) On page 6 of the CFC Brief, Thompson *et al.* also contend that "use of the term 'developmental' is not relevant to any potential health and safety issues associated with the Irradiator." CFC states that

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<sup>6</sup> See 3<sup>rd</sup> Declaration of Marvin Resnikoff, Ph.D in Support of Petitioners' Motion for a Stay dated March 17, 2004 (p. 3).

the obligation of the NRC Staff to evaluate the irradiator's design has been fulfilled. However, Intervenor's disagree, based on analysis and Dr. Resnikoff's Declaration.

Once again, assertions by NRC Staff and CFC counsel are not consistent with the facts. On the contrary, as stated in Dr. Resnikoff's 3<sup>rd</sup> Declaration:

- It has not been proven by technical experts from REVISS that cladding on radioactive sources could withstand the lack of forced air ventilation and cooling precipitated by an extended loss of power. Dr. Resnikoff also observes that heat calculations completed by REVISS are not consistent with the orientation of sources in the plenum. Degradation of sources would result in contamination of air within the plenum and air circulation system, including HEPA filters, and perhaps the pool water and steel pool liner. From there, contamination might be propagated to sanitary sewers, ground water, and the air within the plant and beyond should this experimental system fail to perform as expected.
- The lack of an on-site electrical power backup generator, another serious shortcoming of this experimental irradiation facility, is not a plant "efficiency" issue. It is one of safety. A power source is necessary for protective systems. Dr. Resnikoff observes that this constitutes a failure of the Licensees to comply with 10 C.F.R. § 36.53 (b) (6), in that they have no emergency procedures for accidents involving a prolonged loss of electricity. As mentioned above, cooling of the radioactive sources cannot be achieved by direct contact with pool water because of the unique and radical variations between the GENESIS I design and foregoing Category III irradiator models. Rather, it is the forced air ventilation and filtering system that accomplish this critical end. In the extended absence of electrical power, the Licensee has failed to demonstrate that safety would not be compromised. As stated by Dr. Resnikoff, and not contradicted, "Without clear

measures for recovering from a prolonged loss of electricity, the safety of neighboring members of the public cannot be assured.”<sup>7</sup>

The CFC Brief offers Exhibit A, executed by Mr. Russell Stein from Gray\*Star on March 4, 2004, to show a lack of safety issues at the irradiation facility. Counsel contends that this exhibit provides a more reliable and exact report of Mr. Stein’s conversation with Dr. Sattar Lodhi. Note that Mr. Stein was speaking on his cell phone while driving on the Pennsylvania Turnpike; Dr. Lodhi’s Telephone Conversation Record was composed while he was seated in his office on the actual date of their conversation (September 30, 2003).<sup>8</sup> In Paragraph 18 of his recent affidavit, Mr. Stein contends that his exact words to Dr. Lodhi were that the irradiator plenum would be “no less safe” as a result of the check valve’s removal — not “better and safer” as Dr. Lodhi reports in his official Record. Mr. Stein lacks credibility as demonstrated by the denial of his application for a materials license for an irradiator design using cesium-137.<sup>9</sup>

This correction is more than a trivial modification in the Staff’s understanding of the dialogue. It is important to CFC because the Company contends that replacement of the check valve represents no diminishment in the integrity or safety of the irradiator, and that the irradiator was safe as licensed. Intervenors need hardly point out the significance of the actual language, “better and safer,” with reference to the modified plenum. Nor do we need to stress the superiority in evidence of a contemporaneous record of a phone conversation, entered into the public record by a highly experienced health physicist from the Nuclear Regulatory Commission, compared to recollections made over six months later by Mr. Stein, the irradiator’s designer. It is

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<sup>7</sup> See 3<sup>rd</sup> Declaration, p. 3.

<sup>8</sup> See *Telephone Conversation Record* prepared by Sattar Lodhi on 9/30/03 regarding “Changes in the Plenum.”



obvious that the irradiator's supplier, Gray\*Star, has considerable commercial interest in the success of the Milford Township irradiator project, particularly since the company's prior risky irradiator design was denied a license by the NRC Region I office, a decision that was upheld upon appeal.<sup>10</sup>

**B. The check valve, operated "as licensed" at the base of the irradiator's plenum, poses an imminent threat to public health and safety.**

Contrary to the contentions of the Staff and counsel for CFC, the check valve at the base of the plenum represents an imminent risk to the integrity of the radioactive cobalt-60 sources. It is also a risk to the systems that cool cobalt-60 pencils and trap possible contaminants, and therefore to the purity of pool water and the pool lining, and to the health and safety of plant workers and the community at large. Intervenors contend that this risk could reach the status of a crisis as soon as the steam compromises the stainless steel cladding on just a *single* cobalt-60 pencil among the sixty used in normal plenum operations.

The Staff Brief contends that replacement of the check valve and restoration of the plenum to its originally licensed configuration satisfy the requirements of protection of the public health and safety from radiological hazards (see page 5). The Staff write that they "...discussed these matters with representatives of CFC-L and C.H. Landis, CFC-L's engineering consultant." (*id*) They add, "CFC-L and Landis reported that they had removed the

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<sup>9</sup> See *Program Management Information: Gray\*Star, Inc. – Denial of Application for Sealed Source Registration Certificate (STP-01-018)* dated March 9, 2001. Upon appeal, the ASLB upheld the denial of Gray\*Star's materials license application for the use of cesium-137 sources in "caked power form."

<sup>10</sup> *Id.*

check valve because REVISS had expressed a concern that leakage of the valve might cause deposits on the sources which, in turn, might affect the cladding over time.”

Based on the evidence, it is clear REVISS engineers have not been properly represented on the check valve matter, during the valve replacement snafu or since. It is plainly apparent that the Staff did not show due diligence because they failed to interview REVISS engineers directly regarding the true nature and severity of their expressed concerns. Additionally, the phrase “over time” in the above passage is at odds with the apparent depth of concern on the part of REVISS. The cobalt-60 supplier appears to have demanded immediate, substantial changes in the irradiator design that precipitated the arbitrary, reckless actions of CFC Logistics – in direct violation of their materials license agreement. (Whether there was some material in the plenum at the time is only relevant in that the incident shows that CFC’s Radiation Safety Officer, who describes herself as experienced, is apparently careless regarding license conditions, or disingenuous.)

NRC Staff correctly observe that “(t)he sources are qualified for in-air and in-water storage and CFC-L must maintain the water in the pool at the high level of purity required by 10 C.F.R. § 36.63....” (*id*). In its response, however the Staff failed to address the fact that this irradiator design, in radical departure from foregoing models, creates an operating environment within the plenum that is “neither fish nor fowl.” Surrounded by water, but needing to be completely dry when purged of water through the check valve after source loading, the plenum’s interior could easily receive an ingress of water droplets through that same valve.

Intervenors believe that REVISS, Gray\*Star, and CFC’s Radiation Safety Officer all recognized the imminent potential safety hazard posed by the check valve, then hastily and arbitrarily acted to remove that valve. The purpose of REVISS’ recommended course of action

was to prevent a real problem - the eventuality of entrance of small quantities of water into the plenum that could lead to corrosive steam which would compromise source cladding and become contaminated with cobalt-60. This would immediately clog HEPA filters and provide a pathway for radioactive cobalt-60 to escape from ruptured air supply lines into the irradiator, plant, and surrounding community. Intervenors submit that, with the subsequent reinstallation of the check valve as required by NRC Staff, a serious and imminent risk to the community remains.

The CFC Brief contends that letters from REVISS dated November 7, 2003 and December 3, 2003 indicate “that the check valve on the plenum does not present any threat to the integrity of its registered cobalt-60 ‘sealed sources’ or to public health and safety” (see page 11). This quote, again artfully framed to give a positive impression, is at odds with the actual letters from REVISS, referenced above (see Appendices C and D to CFC Brief). Stipulation in the two REVISS letters, respectively, that “...our concerns are resolved...” and that “...we do not have concerns about the environment in which our source products are being used ...” are based upon “...a clear and definite assurance from CFC that the plenum environment is dry.” (See Appendix C.) Via footnote, in that same letter, REVISS defines “dry” in the following manner:

*“...there is absolutely no liquid water present [in the plenum] in normal operation and that the atmospheric humidity in the plenum chambers can be demonstrated to be indistinguishable from the humidity of air in the surrounding neighbourhood.”*

Intervenors hereby submit that the above conditions required by REVISS are far from assured. Indeed, the REVISS letters significantly deepen, rather than ameliorate, concerns for public safety and welfare.

**C. Intervenor's request for discovery of essential drawing and correspondence between CFC Logistics and its suppliers should be granted, and sanctions awarded.**

The actions of CFC are clearly beyond what was contemplated by the Commission in enacting a No Discovery Rule. The No Discovery Rule could not have been contemplated to have been manipulated by one side in an ASLB proceeding, normally the licensee, so that the licensee could pull documents from its own files or those of its vendors and generate documents supportive of its position while, at the same time, conducting undiscovery to prevent the opposing side from ascertaining the facts. In essence, the production of documents by CFC (i.e., the REVISS letters and their own affidavits) shows that they are not living within the record created for the purpose of furnishing documents to the Staff – they are going beyond it.

The surreal circumstances described herein could not have been contemplated by the Commission. As such, it creates a unique situation warranting certification to the Commission.

While there is the theoretical option available to the Board to ignore or strike the information generated by the abusive conduct of the licensee, this is both unrealistic and unsatisfactory, since the appearance of the consideration would obviously remain, even given the best efforts of the Board.

Another option is available, and if the Board does not certify, then the Intervenor suggests that it be applied:

- treat the withholding of half of the information under the circumstances as proof or indication there is a problem that the unproduced documents would show; and,

- stay the license until the applicant produces the full set of documents (i.e., its communications with REVISS, Gray\*Star, the fabricator, and others involved in the consideration, as well as the fee calculations for the case at issue).

Such a stay would effectively put the Licensee where it would have been potentially, had it released the information. Short of this remedy, however, it is clear that it is unfair to proceed in the present situation because it thwarts justice.

#### The Issue of Sanctions.

As stated in our submission of March 23, which is incorporated herein, there is ample authority in relevant statutory law, the Administrative Procedure Act, for sanctions. As the Board has recognized, non-monetary sanctions may be appropriate in situations where monetary sanctions are not. As stated by the Staff, the Commission has never determined that its internal procedures authorize Boards to impose monetary sanctions. In any case, non-monetary sanctions (even combined with monetary sanctions) are relevant. As a sanction, the license could be stayed and should be stayed pending CFC's compliance with the requirement to release the remaining documents (now that the Company has chosen to release certain documents) and because of the abuse of the Board's process through the extension of its arguments well beyond those which were authorized regarding safety standards required by REVISS.

The Commission has often employed shut-down or other operating restrictions as a sanction, although Intervenor are not familiar with the details.

**D. Important documents and testing protocols are absent from CFC Logistics' application file, in violation of NRC regulations and guidelines. Lapses in analysis and testing create conditions within the irradiation facility that pose an imminent radiological threat to the community.**

In Argument B (above), Intervenor have documented a consistent pattern of lax enforcement and slipshod investigatory practice on the part of NRC Staff. During the period in which CFC was engaged in construction, testing, and loading of the irradiator, and during its initial phases of commercial operation, the NRC Staff:

- claim they did not know and then argued against the significance of terms such as "experimental" and "prototype" in the contract agreement, rather than adequately investigating why they were used by Gray\*Star, the irradiator's designer;
- failed to adequately conduct firsthand investigation of concerns expressed by REVISS underlying the arbitrary and abrupt change in plenum design accepted by Gray\*Star and CFC, then implemented by C.H. Landis, the fabricator of the irradiator.

These failures of the NRC Staff show the issuance of a materials license to CFC Logistics was improper. They occurred within the context of a substantial public challenge to licensure of the irradiator. Aware of this pattern of lax enforcement and investigation in the face of public outcry, Intervenors have examined that license application carefully and have found that some important documents are missing.

Intervenors believe that the Staff have not fully adhered to all required NRC regulations during the review of the license application before its approval and that, as a result, conditions exist that pose an unexamined imminent and significant radiological threat to the community.

CFC's application file lacks the following essential items assuring safe operations:

1. Heat calculations consistent with the full load and operational orientation of radioactive sources in the plenum and cask.

In license application materials, REVISS includes calculations claiming to assure the safety of an arbitrary source configuration (six sources within a single tube surrounded by water at 100° F). In his 3<sup>rd</sup> Declaration, the Intervenors' technical expert, Dr. Resnikoff, shows that these calculations "are not applicable to the CFC Logistics configuration" (*id*). No one has shown calculations within CFC's license application materials demonstrating that the heat generated by the sources in the actual plenum configuration at CFC's irradiation facility would be safe, and would constitute no threat to source integrity.

Rather, available data suggest the opposite – that sources would reach a temperature within the plenum significantly higher than that predicted by the calculations performed by REVISS, with the result that source cladding might be compromised and environmental contamination could occur. Intervenor submit that imminent, significant radiological threat to the community is consistent with existing REVISS calculations, and that the current irradiator apparatus is deficient as currently licensed. Additional scrutiny is warranted by third party technical experts with no commercial interest in the irradiator project. Further, Intervenor contend that NRC Staff, whose independent judgment is being questioned in the context of this ASLB proceeding, should not be the authority on the safety of the GENESIS I irradiator designed by Gray\*Star and operated by CFC Logistics.

As with the actual plenum configuration, there is no discussion of source safety within any specific cask in the application materials file. Following his examination of that file, Dr. Resnikoff states in his 3rd Declaration (see pages 2-3) that REVISS nowhere addresses any particular cask in their heat calculations.

2. Certificates of Compliance indicating that the cobalt-60 pencils and pool liner would not be damaged by the uncontrolled descent of a specific shipping cask in which sources are shipped and stored.



According to their license application, up to sixty cobalt-60 rods might be stored in the irradiator pool during the insertion and removal of the shipping cask via electrically-powered hoist. During cask insertion and removal, the radioactive source materials would be stored in the open pool, unprotected by the plenum or plenum guide. As a result, a cask might drop onto the sources, compromising their integrity and seriously contaminating the pool water and stainless steel pool liner, according to Dr. Resnikoff (see 3<sup>rd</sup> Declaration). Under NRC regulations 10 C.F.R. § 36.39 (C), an applicant must show that the design will prevent the possibility of such a failure, with catastrophic implications for the plant and community. Apparently, staff have failed to investigate this aspect of the design. The application does not include specifications for the cask and a demonstration that pertinent NRC regulations are satisfied.

Also required by 10 C.F.R. § 36.39 (C) is certification regarding the integrity of the pool liner or sources in the event of a *particular* cask involved in unrestricted descent. Any breach in the stainless steel pool liner would immediately cause the loss of contaminated shielding water into the underlying subsoil and groundwater. This represents an immediate and plausible pathway for radioactive cobalt to escape from the plant into the surrounding environment. Such certification is entirely absent from the application materials, once again demonstrating the failure of CFC to clear a

licensing hurdle, and disregard by NRC Staff to adequately examine application documents.

In addition, no certification has been provided demonstrating that the electrical hoist used during cask insertion and removal is single-failure proof or that shipping casks could not crash onto unprotected radioactive sources. On the contrary: 1) the cask is permitted by crane design to pass directly over the unprotected radioactive sources, and 2) operator competence and diligence are the sole insurance against cask fall onto the radioactive rods (*id*). Therefore, Intervenors submit herewith that CFC's current license and irradiator configuration contravenes 10 C.F.R. § 36.39 (C) requiring that "a dropped cask would not fall on sealed sources."

On September 10, 2003, in his presentation during an Oral Argument in Allentown, Pennsylvania, NRC Staff Attorney Stephen Lewis stated that compensating for loss of pool water during a power outage could be accomplished with a "garden hose."<sup>11</sup> While true, this contention demonstrates a poor understanding of how the plant operates, its novel design, and how sources are cooled and kept safe. Nonetheless, Mr. Lewis does acknowledge the serious risk to the community posed by a cask drop caused either by mechanical breakdown or lack of operator diligence. Following is an excerpt from pages 254-255 of the transcript of that proceeding:

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<sup>11</sup> See page 254 of the *Transcript of Oral Argument held in Allentown, PA on 9/10/03*; pp. 120-267.

**Chairman Farrar:** So they don't need diesel generators?

**Mr. Lewis:** No. No, they need a garden hose. The cast [sic] drop analysis, the information that we have been provided on this – and once again I think that this is in Mr. Kinnerman's [sic] affidavit, but the record will show if it is there or not. I don't have that right in front of me – is that the analyses that were done by the licensee were driven by the operating procedures they were going to use.

And the operating procedures that they were going to use per event, the cast [sic], with the replacement sources in it or new sources in it, from moving over the sources, and that was discussed in today's site visit.

Could something happen that resulted in that not being met? Yes. Does it rise to the level of believing that there is irreparable harm associated with that event? I think not.

In order for that to have to happen, I think that there would have to either be a serious mechanical background [sic] which could happen, or the operators, whom we have met today, would have to somehow not properly stop the cast [sic] motion where it was supposed to.

Records from the Nuclear Regulatory Commission Office of Nuclear Material Safety and Safeguards further document the cause for this serious concern. They add urgency to scrupulous enforcement of the above-referenced regulation against the possibility of cask descent onto cobalt-60 sources, and shed a spotlight onto the importance of the documents missing from CFC's materials license application authorized by NRC Staff. An *Information Notice from Office of Nuclear Material Safety and Safeguards (Information Notice No. 89-82: Recent safety-related incidents at Large Irradiators)* documents an unrestricted cask fall of nineteen feet before an alert operator activated a manual braking device to prevent it from crashing into the rods and pool structure. In the absence of this alert response, " ... [the cask] ... could have damaged the

radioactive sources in the pool or the pool itself.” (*Id.*) This Information Notice is attached hereto as Exhibit B.

Intervenors submit that the irradiator designed by Gray\*Star and operated by CFC Logistics, as currently licensed, is deficient in providing adequate measures to prevent the uncontrolled descent of shipping casks that could damage the sealed sources or pool liner. This equipment therefore constitutes a significant and imminent radiological threat to the surrounding community.

The Staff contend that the NRC docket contains all the information they reviewed to support their issuance of a materials license. Further, they assert that the information at hand was sufficiently complete to assure the safety of the GENESIS I irradiator design. Intervenors submit that NRC Staff’s review of license application materials is deficient and that the latter contention is patently untrue.

More generally, Dr. Resnikoff further observes that there is absolutely no mention *at all* about the eventuality of shipping cask failures or drops in any of the license application materials. NRC staff members have clearly not done their job in reviewing these aspects of the application, and have misled Intervenors and the ASLB Administrative Judges by contending that all necessary materials were examined.

Intervenors’ technical expert must evaluate the risks inherent in a cask drop and use of the cask as a storage device. Consequently, Intervenors request that the NRC Staff immediately locate and place within CFC’s file the specific design of casks supplied by REVISS used to ship and store radioactive cobalt-60 sources.

### III. CONCLUSION

For the foregoing reasons, the Atomic Safety and Licensing Board should stay the effectiveness of the materials license issued to CFC Logistics (prohibiting the use and further shipments of cobalt-60), certify for discovery, and impose sanctions.

Respectfully submitted,



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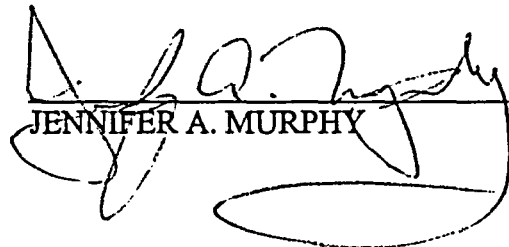
COUNSEL FOR INTERVENORS

**CERTIFICATE OF SERVICE**

I, Jennifer A. Murphy, hereby certify that I have served a copy of the Intervenor's Reply to Responses of NRC Staff and CFC Logistics Regarding Staff Questions and Pending Motions by first-class mail, email, and facsimile on the following persons on this date:

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JENNIFER A. MURPHY

DATED: April 2, 2004

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# **EXHIBIT A**

UNITED STATE OF AMERICA  
NUCLEAR REGULATORY COMMISSION  
ATOMIC SAFETY AND LICENSING BOARD

Before Administrative Judges:  
Michael C. Farrar, Presiding Officer  
Charles N. Kelber, Special Assistant

In the Matter of  
CFC Logistics, Inc.

Materials License Application

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Docket No. 03036239  
ASLBP No. 03-814-01-ML

**3<sup>rd</sup> DECLARATION OF MARVIN RESNIKOFF, Ph.D.  
IN SUPPORT OF PETITIONERS' MOTION FOR A STAY**

Under penalty of perjury, I, Dr. Marvin Resnikoff, hereby declare that:

1. I am a physicist with a Ph.D. in high-energy theoretical physics from the University of Michigan and also the Senior Associate of Radioactive Waste Management Associates (RWMA), a private technical consulting firm based in New York City. I previously filed declarations in support of a stay motion. My credentials to discuss the technical issues involved in the CFC Logistics irradiator were previously stated in that declaration and will not be repeated here.
2. In the four month period since the last declaration, I have reviewed additional documents in order to prepare this declaration. I reviewed additional documents in the NRC docket referenced by NRC Staff and believe I have now reviewed all documents in the NRC docket. For the previous declaration, I also reviewed confidential court papers from the Bucks County Court suit before Judge Kenneth Biehn. In particular I reviewed the sales agreements between CFC Logistics and Gray\*Star and Reviss Services, respectively. Gray\*Star is the designer of the contested irradiation facility and Reviss Services is the supplier of Co-60 sources. I have also toured the irradiator facility.
3. **Prolonged Loss of Electricity.** In my previous declaration I discussed a loss of electricity accident and the fact that the licensee does not have an emergency electric generator in case of an extended power failure. I pointed out that the application fails to provide specific information regarding the heat rate and the number of hours until the source cladding degrades. The application does not contain detailed information on how rapidly the sources will heat up and the consequences of overheating. This information is needed to know how long the electricity may remain off before a serious accident ensues. In the event of overheating, the cladding around the sources could fail, contaminating the air and overloading the HEPA filters. Co-60 could be released to the external environment. This previous concern is heightened by the fact that, according



to the court papers, CFC does not have the design knowledge to repair the irradiator if an accident occurs.

4. In the February 27, 2004 Staff Response, the NRC Staff pointed out that these calculations do appear in the docket, in ADAMS ML031210348. I previously briefly noted that those calculations were inadequate and therefore I still have great concern about this safety question.
5. The calculations by Reviss that appear in ML031210348 pertain to 6 sources, 100,000 Ci Co-60 total, within a 3 inch diameter tube surrounded by water at 100 °F. From the heat production within source material, the calculation uses standard Boltzman and convection equations to determine the temperature of air within the tube and of the sources themselves. This calculation is then compared to actual temperature measurements within a shipping cask. I agree with the conclusions by Reviss for the configuration considered, but they are not applicable to the CFC Logistics configuration. It does not appear the Staff carefully evaluated this matter.
6. The CFC Logistics configuration involves 1,000,000 Ci Co-60 within a larger plenum surrounded by water at 100 °F. In this configuration, the centermost 3 inch diameter tube will be hotter than the outermost tubes. The Reviss calculations do not examine the CFC Logistics source configuration. To see whether this is important, one should consider the graph RTMxxx App.2. This graph shows the temperature of one 8.3-inch-source, rising from 160 °C at the end to 255 °C at the center. Expressed in absolute temperature (Kelvin), this corresponds to a temperature increase of 22 %. Note that the sources at CFC Logistics are organized in 55-inch-pencils containing three individual sources stacked on top of each other. It can be assumed that the maximum/minimum temperature difference within a source would increase with its length.
7. In their heat transfer model, Gray\*Star calculated the average surface temperature of six sources to be 299 °C (ML031210348 at 4). They also included a maximum temperature of 338 °C, but it is not explained how this value was obtained. From the context of the calculations it appears that the maximum temperature pertains to the hottest source surface location within a single plenum pipe loaded with six sources. However, what is relevant in this context is the hottest source surface inside the plenum loaded with a total of 60 sources, distributed along the entire width and height of the plenum. Just as the temperature in the middle of a plenum pipe is greater than at the ends, the temperature in the middle of the plenum must be greater than the temperature on either side. CFC Inc. has not provided these calculations, and it is thus impossible to estimate whether or not the maximum source temperature in the center of the plenum exceeds the temperature thresholds given by Reviss. Since these temperature calculations are not in the NRC file, we assume that the NRC staff has not examined these calculations either.
8. Source surface calculations for transfer cask Reviss Model No. 3750A, the cask presumably used for the transportation of the sources (at this point, I have not seen any documents that explicitly state which cask is to be used), show that if filled to capacity

of 340 kCi, the steady-state average temperature at the source surface will reach 526 °C (ML0112105440 at 8), far above the 400 °C specified by Reviss (ML031210348 at. 2).

9. It is important to note that the sources are cooled by air circulating within the plenum, not by the water within the pool. The issue is not one of replacing pool water, but circulating air within the plenum in the absence of electricity. Petitioners will argue that the sources could degrade under high temperatures and that CFC staff do not have the design knowledge and the ability to correct the situation.
10. In addition, contrary to 10 C.F.R. §36.53(b)(6), the licensee has no emergency procedures for accidents involving a prolonged loss of electricity. In particular, CFC Logistics does not have an emergency generator. Without clear measures for recovering from a prolonged loss of electricity, the safety of neighboring members of the public cannot be assured.
11. **Cask Drop Accident.** Based on my experience with loading and unloading irradiated fuel, this stage is the most precarious and susceptible to a major accident if the equipment, training and emergency procedures were not up to this difficult task. According to the license application, a shipping cask containing up to 200,000 Ci of Co-60 sources would be inserted into the pool. Sources would be removed and placed underwater on one side of the pool, away from the cask. The plenum would be removed before this operation. The shipping cask could drop onto the sources, seriously contaminating the pool water. This contamination would have to be removed with ion exchange columns that would become extremely radioactive. The steel-liner of the pool would become radioactively contaminated. Some of this radioactivity could be released to the sanitary sewers and the air.
12. A cask drop accident could occur during loading of Co-60 into the proposed facility. It could also occur during removal of the sources from the pool. If the sources were bent out of shape it might not be possible to return them to the shipping cask for removal. Since the 0.38-inch-diameter sources are not designed to carry any weight other than their own (ML0306300360 at 24), they would be easily crushed/deformed by a cask that weighs several tons.
13. In my opinion, a cask drop accident could seriously contaminate the pool and lead to water contamination and air contamination that could be ventilated to the external environment. Given that some residents live as close as a quarter mile from the proposed facility, the resulting contamination could adversely affect public health. It would also be very expensive to clean up.
14. Following a discussion with CFC Logistics staff, it is clear that the control to prevent this type of accident is entirely administrative. The crane is not single failure proof; during loading or unloading operations, the cask can directly pass over the unprotected sources at the bottom of the pool. Only operator diligence and competence prevents an accident. This situation also directly contravenes 10 CFR 36.39(c), that requires that the facility be designed such that "a dropped cask would not fall on sealed sources."

15. **Check valve.** I have reviewed the Staff and CFC submissions concerning the deletion and replacement of the check valve. According to CFC Logistics, the check valve removal was designed to increase efficiency. While this may be true, a matter of safety was also involved, as stated by Revis. The check valve allowed for the ready removal of water from the plenum. Revis did not want water to enter the plenum because of its concern for corrosion of the sources. The staff states the sources are designed for either wet or dry environments. But the staff completely misses the point here. We are not concerned with wet or dry; we are concerned with a steam environment that is not presented with other types of irradiators. This directly relates to the prototypical and experimental nature of this system, discussed in my previous declaration. CFC Staff has not responded to the other prototype developmental issues. The rule of science and engineering is that new systems have an infinite number of possible problems, and the check valve reversals are consistent with a situation in which there is no established scientific methodology. To the contrary, it shows a trial and error situation.
16. **Decommissioning Funds.** I pointed out previously that contrary to 10CFR30.35(e), the applicant does not have a cost estimate for decommissioning. "Each decommissioning funding plan must contain a cost estimate for decommissioning and a description of the method of assuring funds for decommissioning from paragraph (f) of this section, including means for adjusting cost estimates and associated funding levels periodically over the life of the facility." I am aware that the applicant has posted \$75,000 financial assurance and that the staff will require an additional amount. My concern here is that the company has not posted sufficient funds to decommission the facility in case of an accident.
17. The staff has argued that the Permagrain, West Valley and NMI/Starmet situations are not applicable to the CFC Logistics irradiator. Of course there are differences that the staff highlights, but the staff has to come to terms with their own failures, that have left taxpayers with huge costs that should have been borne by the companies. Region 1 and specifically staff John Kinneman have been notably lax in requiring licensees to accurately estimate decommissioning costs and to provide the necessary financial assurance. Without the ready availability of cash, companies cannot easily recover in case of an accident and the community is at peril. For 15 years, the NRC was aware that the NMI/Starmet facility in Concord, Massachusetts had contaminated the underlying aquifer, yet it was never able to obtain the necessary financial assurance from the company; the federal government may have to put up over \$10 million for remediation of the facility. This is clearly an issue that must be removed from staff's hands and be put before the hearing officer.
14. If the petitioners' concerns are admitted for evidentiary hearing, I would testify regarding my opinion in support of these conclusions. The technical facts and analyses described above provide an abstract of the testimony I would give, based on the information that has been furnished to date. I would expect to be able to expand upon and refine my testimony, after having an opportunity to review materials produced by CFC and the NRC Staff.

I declare under penalty of perjury that the factual information provided above is true and correct to the best of my knowledge and belief, and that the professional opinions expressed above are based on my best professional judgment.

Executed on this 17th day of March, 2004.

Dr. Marvin Resnikoff, Senior Associate  
Radioactive Waste Management  
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New York, NY 10001  
Phone (212) 620-0526  
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# **EXHIBIT B**

UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
OFFICE OF NUCLEAR MATERIAL SAFETY AND SAFEGUARDS  
WASHINGTON, D.C. 20555

December 7, 1989

Information Notice No. 89-82: RECENT SAFETY-RELATED INCIDENTS AT  
LARGE IRRADIATORS

Addressees:

All U.S. Nuclear Regulatory Commission (NRC) licensees authorized to possess and use sealed sources at large irradiators.

Purpose:

This notice is intended to inform recipients of recent safety-related incidents at large irradiators and emphasizes the need for proper management actions and attention to preventive maintenance programs. This notice also serves to remind licensees of other safety-related incidents at irradiators covered in Information Notice 87-29. It is expected that licensees will review this information, distribute the notice to responsible radiation safety staff, and consider actions, if appropriate, to ensure both proper preventive maintenance programs and proper management actions to preclude similar situations from occurring at their facilities. However, suggestions contained in this notice do not constitute any new NRC requirements, and no written response is required.

Description of Circumstances:

A description of each of the following events is provided in Attachment 1. In summary, these events included:

- x Deliberate bypass of the radiation monitor interlock system and another safety system designed to protect individuals from radiation-produced noxious gases.
- x Significant contamination of pool water remaining unnoticed, which could have been detected sooner, had the pool water been continuously circulated and monitored through the demineralizer.
- x An uncontrolled descent of a shipping cask into an irradiator pool, due to brake malfunction on a lifting crane.
- x Leaks in the irradiator pool caused by localized caustic stress corrosion in pool liner welds.

Discussion:

Licensees are reminded of the importance of ensuring the safe performance of licensed activities in accordance with NRC regulations and the requirements of their licenses. Irradiators with high activity sealed sources are capable of delivering life-threatening exposures in a short period of time. Therefore, compliance with regulatory requirements and proper equipment maintenance is critical to safe operation.

Event Nos. 1, 2 and 3 on Attachment 1 illustrate a failure by management to assure that proper safety and maintenance procedures are followed. In June 1987, NRC brought to the attention of irradiator licensees other incidents that were caused by similar management practices. (See Attachment 2). Event No. 4 on Attachment 1 is included in this notice to remind licensees of the possibility of pool leakage, the need to investigate the causes of such occurrences, and their responsibility to take appropriate corrective action.

In view of the current and past incidents at irradiator facilities, it is strongly recommended that supervisory personnel be reminded of their responsibilities to evaluate potential safety hazards and assure safe operation at their facilities. The incidents described in Attachment 1 demonstrate the importance of:

1. Not bypassing interlock systems and other safety systems.
2. Adhering to regulatory requirements, license conditions and authorized operating procedures.
3. Continuously using demineralizers equipped with radiation monitors, or alternatively, frequently monitoring pool water conductivity and radioactivity concentration.
4. Properly maintaining equipment used with or incident to handling licensed materials.
5. Taking appropriate and effective action when operational abnormalities are observed.

Licensees are reminded that NRC must review and approve operating and emergency procedures prior to implementation at irradiator facilities. Licensees are also reminded that operating procedures approved by NRC during the licensing process are incorporated by reference into the license as requirements. Such operating procedures cannot be modified without prior approval. If you have developed alternate procedures that could be used temporarily to keep your facility operating during maintenance intervals, you must file an amendment with NRC regional offices, for review and approval, before such procedures can be used at your facility.

No written response is required by this information notice. If you have any questions about this matter, please contact the appropriate regional office or this office.

Richard E. Cunningham, Director  
Division of Industrial and  
Medical Nuclear Safety  
Office of Nuclear Material Safety  
and Safeguards

Technical Contact: Tony Huffert, NMSS  
(301) 492-0529

Attachments:

1. Events That Occurred at Large Irradiator Facilities
2. Information Notice No. 87-29
3. List of Recently Issued NMSS Information Notices
4. List of Recently Issued NRC Information Notices

RECORD NOTE:

Event No. 1 occurred at Isomedix, Inc. (Docket Nos. 030-08985 and 030-19752) at their Parsippany, NJ and Northboro, MA plants in August 1987.

Event No. 2 occurred at Radiation Sterilizers, Inc. (State of GA licensee) at the Decatur, GA plant in June 1988.

Event No. 3 occurred at Radiation Sterilizers, Inc. (State of GA licensee) at the Decatur, GA plant in July 1989.

Event No. 4 occurred at the Defense Nuclear Agency's Armed Forces Radiobiology Research Institute (Docket No. 030-06931) in Bethesda, MD in April 1989.



## EVENTS THAT OCCURRED AT LARGE IRRADIATOR FACILITIES

1. A licensee deliberately bypassed the radiation monitor interlock systems and substituted an administrative procedure for the engineered safeguard provided by the radiation monitor interlock. The substituted cell entry procedure was implemented without NRC review, approval and incorporation in the license. The alternate procedures did not constitute an entry control device that functioned automatically to prevent inadvertent entry and did not comply with the requirements of 10 CFR Subsection 20.203(c)(6)(i). In addition, the licensee installed jumper cables to bypass ventilation system interlock which were designed to automatically protect individuals from noxious gases produced as a result of irradiation.

Because of the extremely high radiation exposures that could result if interlock are not operational, NRC concluded this incident was a very serious violation of safety requirements. The licensee was not allowed to operate the irradiator until all safety systems were fully operational. This violation of NRC requirements, along with other safety-related violations, resulted in NRC proposing a substantial civil penalty.

2. Leaking cesium-137 source capsules contaminated pool water at Radiation Sterilizers, Inc.'s (RSI's) Decatur, GA plant and remained undetected for an extended period of time, because the licensee did not use the pool water monitoring system associated with the demineralizer. The contamination problem was finally discovered when the licensee took discrete samples and performed radiation surveys of the pool water, after activation of the radiation-level monitoring system, which had automatically locked the sources in the safe storage position, due to excessive radiation levels while the sources were in the stored position.

Failure to continuously use the demineralizer/pool-water monitoring system was contrary to the licensing Agency's understanding of the operations. Had the demineralizer been operated continuously, pool water contamination possibly could have been detected earlier and enabled the licensee to begin mitigating the contamination.

The facility has been shut down since June 1988. The U.S. Department of Energy (DOE), its contractors, and the State of Georgia are managing decontamination efforts at the site, which have been estimated to cost several million dollars so far. The DOE and RSI are also in the process of removing all the Waste Encapsulation Storage Facility sources from the RSI facilities at Decatur, Georgia and Westerville, Ohio and shipping them to DOE.

EVENTS THAT OCCURRED AT LARGE IRRADIATOR FACILITIES

(continued)

The State of Georgia and DOE are conducting investigations of other aspects and lessons learned as a result of this event. NRC has been periodically providing information in the NMSS Licensee Newsletter on the status of the DOE investigation into the cause of the source leakage. Licensees will be sent further information when it becomes available.

3. A contractor providing lifting crane services at a licensed facility was moving a shipping cask from the source storage pool to a mezzanine area, when the cask made an uncontrolled descent of approximately 19 feet. The cask stopped its descent approximately five feet below the surface, only after an operator activated a manual brake. No personnel were injured and there was no damage to, or contamination of, the licensee's facility or equipment as a result of this event. However, had the cask not been secured quickly, it could have damaged the radioactive sources in the pool or the pool itself.

This incident was a result of improper brake adjustment of the crane hoist. The crane brake was subsequently repaired and recertified for normal operations in accordance with current Occupational Safety and Health Administration regulations. Braking system inspection and adjustment, as well as functional load testing, are now established daily procedures before crane operation.

4. A licensee experienced a loss of pool water for several weeks that was approximately three times higher than expected from evaporative losses. The licensee performed tests to characterize the nature and quantity of the water loss and began daily assays of the pool water to determine compliance with release limits for unrestricted areas. Suspecting a leak in the irradiator pool, the licensee inspected the stainless steel liner and found localized caustic stress corrosion in many welds.

Apparently, welds made during construction of the facility in 1968 were not in accordance with industry standards. Thus, these faulty welds were subject to caustic stress corrosion which resulted in the recent pool water losses.

The facility has been shut down pending completion of repairs.

SUGARMAN & ASSOCIATES, PC

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April 2, 2004

VIA ELECTRONIC MAIL, FACSIMILE AND U.S. FIRST CLASS MAIL

Administrative Judge Michael C. Farrar  
Presiding Officer  
Atomic Safety and Licensing Board Panel  
U. S. Nuclear Regulatory Commission  
Washington, DC 20555-0001

U.S. Nuclear Regulatory Commission  
Office of the Secretary  
Attn: Rulemaking and Adjudications Staff  
One White Flint North  
11555 Rockville Pike  
Rockville, MD 20852

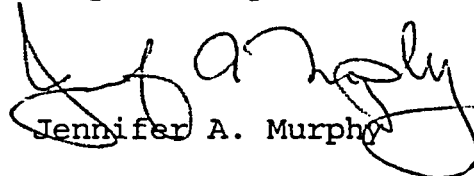
RE: CFC Logistics, Inc.  
Docket No. 30-36239-ML  
ASLBP No. 03-814-01-ML

Dear Judge Farrar and Secretary:

Please find enclosed Intervenors' Reply to Responses of NRC Staff and CFC Logistics Regarding Staff Questions and Pending Motions in the above-captioned matter.

Thank you for your consideration.

Respectfully,

  
Jennifer A. Murphy

Enclosure

cc: Stephen Lewis, Esquire  
Anthony Thompson, Esquire