40-7102

SHIELDALLOY METALLURGICAL CORPORATION

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September 15, 1995

Mr. Gary C. Comfort, Jr.
Licensing Section 2
Division of Fuel Cycle Safety and Safeguards, NMSS
U. S. Nuclear Regulatory Commission
Washington, D.C. 20555-0001

Re: Request for Additional Information for Safety Evaluation Report for License Renewal Application (TAC No. L21474)

Dear Mr. Comfort:

Shieldalloy Metallurgical Corporation (SMC) is in receipt of your June 15, 1995 request for additional information in regard to our license renewal application. Enclosed are our responses to *your specific questions.*

As advised in your letter, SMC is re-submitting its license renewal application to reflect current conditions and operational parameters. This submittal has been forwarded to you along with the above referenced response. The implementing procedures referenced in the application are being supplied for your review under separate cover. However, they are not to be incorporated as license conditions. If you have any questions or if I can provide you with additional information, please contact me at (609) 692-4200.

Sincerely,

C. Scott Eves
Radiation Safety Officer and
Vice President, Environmental Services

cc: H. Nils Schooley
Jay E. Silberg, Esq.
John Kinneman, USNRC Region 1

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NRC

ADDITIONAL INFORMATION TO SUPPORT THE LICENSE RENEWAL APPLICATION FOR SHIELDALLOY METALLURGICAL CORPORATION AT NEWFIELD

RSO's Authority to Stop Work (pg. 21)

1. USNRC Request: Provide a copy of the procedure(s) stating when and how the Radiation Safety Officer (RSO) is permitted to use a stop-work order.

> **Licensee Response:** The RSO is permitted to stop work when, in the opinion of the RSO, it is necessary to prevent unnecessary exposure to radioactivity. A Radiation Safety Procedure (RSP-017) will be developed to guide implementation of this authority.
>
> **Action Taken:** The stop work authority of the RSO is more clearly described in the new license renewal application.

2. USNRC Request: Are there any designees that also have the RSO's authority to stop work if the RSO is not available?

> **Licensee Response:** The Alternate RSO (ARSO), and authorized users may stop work if necessary to prevent unnecessary exposure to radioactivity.
>
> **Action Taken:** The stop work authority of these individuals is more clearly described in the new license renewal application.

Monitoring

1. USNRC Request: Provide a detailed description of all of your radiological monitoring programs. Include frequencies types of data recorded, etc., in your response. Copies of procedures may be used to supplement the response.

> **Licensee Response:** Radiation Safety Procedure No. RSP-008, "Instrumentation and Surveillance" contains the methodology by which routine surveillance is performed.
>
> **Action Taken:** A more detailed description fo the radiological monitoring program is included in the new license renewal application.

Airborne (Proposed Condition 5)

2. USNRC Request: Provide the latest quarterly results of airborne monitoring that will be retained as a record.

Licensee Response: None required.

Action Taken: A copy of the latest quarterly air monitoring results are attached. (See page 14).

Ambient External (Proposed Condition 8)

3. USNRC Request: The proposed condition states that ambient external monitoring will be conducted quarterly, and page 30 states that the deployment of the area monitors will be at the discretion of the RSO. Since the results of this program may be used (as proposed by the application) for assignment of external doses in place of personnel dosimeters, what procedures are used by the RSO to ensure that placement of the monitors adequately models personnel exposures?

Licensee Response: See new license renewal application.

Action Taken: The reference to the use of ambient exposure rate monitoring for personnel dose assessment has been removed in the new license renewal application.

4. USNRC Request: What are the highest quarterly area dosimeter results to date? At what location was this measurement detected?

Licensee Response: The highest dosimeter result for Quarter 2 of calendar year 1995 is 1265 millirem over a 51 day deployment period. The dosimeter that provided this result was located in D102 in the immediate vicinity of a stockpile of CANAL®.

Action Taken: None required.

5. USNRC Request: What actions are to be taken if abnormally high results are detected by the dosimeter? What level of exposure results in these actions?

Licensee Response: SMC no longer intends to use the results of ambient exposure rate monitoring to assign personnel exposures. The results obtained from such placement are for informational purposes only.

Action Taken: The reference to the use of ambient exposure rate monitoring for personnel dose assessment has been removed in the new license renewal application.

Offsite Exposure (Proposed Condition 9)

6. USNRC Request: Without an on-line monitoring system at the stacks, what information/data is used to evaluate the dose to the maximally exposed off-site individual? Who has responsibility for this calculation?

> **Licensee Response:** In 1993, SMC evaluated the airborne emissions from the plant in a report entitled "Radiation Dose Estimates for Members of the General Public at the Newfield New Jersey Facility".[1] This analysis, which combined known baghouse efficiencies and the results of atmospheric dispersion modeling, were used to determine the population dose estimate pursuant to 10 CFR 20.1301 and 40 CFR 61. A methodology for confirmatory sampling is being developed, the results of which will be incorporated into RSP-010, "Exposure Control".
>
> **Action Taken:** RSP-010 will be modified, as necessary, to incorporate the new confirmatory sampling methodology. Pursuant to RSP-003, "Control of Radiation Safety Procedures" and the new license renewal application the USNRC is an authorized recipient of copies of all Radiation Safety Procedures. Therefore, the USNRC will be notified of the modification immediately upon implementation.

Internal Monitoring

7. USNRC Request: What is the frequency for random internal personnel surveys, as discussed on page 29 of the application?

> **Licensee Response:** SMC no longer intends to implement random internal personnel surveys.
>
> **Action Taken:** The reference to random personnel surveys has been removed in the new license renewal application.

8. USNRC Request: Which internal radiation monitoring method (e.g., urinalysis, whole-body detector, etc.) will be used for the types and quantities of radioactive material used by the employees?

> **Licensee Response:** SMC intends to implement a combination of stationary air monitoring, breathing zone sampling, and indirect bioassay for evaluating internal radiation exposures. Radiation Safety Procedure No. RSP-010, "Exposure Control" contains the methodology by which internal radiation monitoring and dose assessment will be performed.

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[1] IT Corporation, "Radiation Dose Estimates for Members of the General Public at the Newfield, New Jersey Facility", IT Corporation Report No. IT/NS-93-107, February 16, 1993.

Action Taken: None required.

Radiation Safety Committee (RSC) (Proposed Condition 4)

1. **USNRC Request:** What are the RSC membership requirements (e.g., experience, training, etc.)?

   Licensee Response: RSP-006 "Training and Qualifications of Radiation Protection Personnel-Newfield Facility" outlines the requirements for RSO, ARSO, radiation surveyors, authorized users and radiation safety committee members.

2. **USNRC Request:** Other than annual meetings to establish ALARA goals, how and when is it determined necessary for the RSC to meet to review procedural changes, etc.?

   Licensee Response: Since the RSC is responsible for reviewing and approving all elements of the radiation protection program, the RSC will meet whenever a Radiation Safety Procedure must be reviewed and approved as adequate.

   Action Taken: None required.

3. **USNRC Request:** How many RSC members form a quorum?

   Licensee Response: More than fifty percent of the seven permanent members of the RSC form a quorum. Additional members, as needed to address specific issues, will be brought into the meeting. There is no quorum of additional members.

   Action Taken: None required.

4. **USNRC Request:** Submit an update of your RSC membership by job title (e.g., RSO, Vice President of . . ., etc.).

   Licensee Response: The permanent members of the RSC include the RSO, the ARSO, the Vice President of Human Resources, the Training and Safety Manager, the Vice President/General Manager, Production Superintendent and a Certified Health Physicist may participate, on an as-needed basis, depending upon the particular topic that is being addressed.

   Action Taken: The composition of the RSC is described in the new license renewal application.

5. **USNRC Request:** During its meetings, does the RSC analyze monitoring data to determine trends in exposures or effluents as part of its ALARA review? Identify the senior management to which the RSC reports its findings.

Licensee Response: The types of monitoring data to be reviewed by the RSC include, but are not limited to those outlined in the attached Radiation Protection Program Plan. Significant findings of the reviews are reported to the President.

Action Taken: None required.

Contamination Surveys (Proposed Condition 6)

1. USNRC Request: The definition of "Restricted Area" in your application (page 15) refers to areas with limited access for purposes of controlling radioactive material exposures to individuals. Therefore, the term "Unrestricted Area" seems to refer to areas other than restricted within the controlled area. Is this a correct interpretation?

Licensee Response: In RSP-002, "Definitions", the SMC controlled area is defined as any area within the Newfield site (fence line) boundaries. A restricted area is defined in RSP-002 as an area at the Newfield facility, accessible to humans, to which access is limited by SMC for the purpose of protecting individuals against undue risks from exposure to radiation and radioactive materials. At the Newfield facility, a restricted area has an ambient exposure rate and/or contamination levels that may result in an individual receiving a total effective dose equivalent in excess of 100 millirem per year. An unrestricted area is defined in RSP-002 as any area to which access is not controlled for the purposes of protecting individuals from exposure to radiation and radioactive material.

Action Taken: None required.

2. USNRC Request: Based on the interpretation of unrestricted area above, what portion of the unrestricted area is surveyed for contamination? How are survey locations determined?

Licensee Response: At Newfield, contamination levels that exceed the release criteria are not permitted in the remainder of the plant. If elevated activity should be identified anywhere other than restricted areas, it would indicate a breakdown in the routine contamination control program, or signify that an unidentified contamination incident may have occurred. Therefore, monitoring of common areas, provides reassurance that control has been maintained. Radiation Safety Procedure No. RSP-008, "Instrumentation and Surveillance" describes the survey locations evaluated during surveillance activities.

Action Taken: A copy of RSP-008 will be made available for review as supplementary information to the new license renewal application.

3. **USNRC Request:** For fixed and removable ("loose") contamination limits presented on pages 34-35 of your application, are these limits total disintegrations from all sources of radiation (e.g., alpha, beta, and gamma sources)?

Licensee Response: SMC has modified the contamination limits for the Newfield facility to address the isotopic ratios that are present. These limits are described in RSP-009, "Contamination Control".

Action Taken: A copy of RSP-009 is made available for review as supplementary information to the new license renewal application.

Organization

1. **USNRC Request:** Update your radiation safety organization, including the use of Health Physics consultants, as appropriate. For each position, list the educational, experience and training requirements and provide a short summary of duties and responsibilities.

Licensee Response: The radiation safety organization will be more clearly described in RSP-008.

Action Taken: None required.

2. **USNRC Request:** Currently, Mr. H. Nils Schooley, President of SMC, is responsible for the overall control and authority for radiological protection. In the future, is this responsibility defined by position or by individual?

Licensee Response: This responsibility is defined by position.

Action Taken: None required.

3. **USNRC Request:** Rather than listing specific individuals in your license, we recommend license conditions that authorize the Radiation Safety Officer to approve an individual who has completed the authorized users and the radiation workers training programs and has met any other conditions (if any) as defined by the position's requirements. Please indicate if such a condition is acceptable.

Licensee Response: Concur.

Action Taken: None required.

4. **USNRC Request:** Describe how your radiation protection personnel interact, in a timely manner, with production personnel to ensure that methods and techniques for reducing occupational radiation exposure are incorporated in facility operations.

Licensee Response: The primary mechanism for interaction between radiation protection and operations personnel is via the RSC. In addition, monthly safety meetings are held, at the department level, wherein radiation safety issues are discussed, if applicable.

Action Taken: None required.

5. USNRC Request: Describe what health physics personnel (as per proposed condition 7) are available to SMC. Include position requirements, responsibilities, and their reporting chain in question 1 of this section. Does the RSO and assistant RSO meet the requirements of health physics personnel as stated in the definition on page 13?

Licensee Response: SMC no longer intends to use the term "health physics personnel" in describing the radiation safety organization.

Action Taken: The radiation safety organization is more clearly described in the new license renewal application.

6. USNRC Request: What methods of interaction are employees given to notify management of unsafe conditions at the facility? Is there a method for tracking such comments and recording their disposition?

Licensee Response: Communication mechanisms for employees are provided during general employee training, radiation worker training, monthly safety meetings, and other health and safety training programs. All Unsafe Condition Reports relating to radiation protection issues will be presented to the RSC, who will initiate corrective actions and document the closure status in RSC meeting minutes.

Action Taken: None required.

Procedural Changes

1. USNRC Request: How is the review of procedural changes documented (from initiation to RSC review to employee training)?

Licensee Response: The methodology for control, issue and distribution of Radiation Safety Procedures is contained in the new license amendment application.

Action Taken: None required.

2. USNRC Request: How soon after (or before) implementation of new procedures are employees notified of their existence and trained in their use?

Licensee Response: The methodology for control, issue and distribution of Radiation Safety Procedures is contained in the new license amendment application.

Action Taken: None required.

Material Control

1. USNRC Request: Is an inventory log available which tracks licensed material in the slag storage yard for slag and dust pile accumulation as separate inventories? If so, how often is it updated?

Licensee Response: The original inventory of stockpiled material was determined in the early 1990's from the results of a fly-over of the Newfield plant that produced volume estimates of the slag and baghouse dust piles. Using the volume estimates, along with mean concentrations of source material in each pile, an initial inventory estimate was produced. Since that time, source material is added to the inventory based on the concentration of U and Th in the pyrochlore received. However, it is not possible to distinguish between the form of the materials after ferrocolumbium production. The log is updated once each quarter.

Action Taken: None required.

2. USNRC Request: Submit updated inventories of radioactive material accumulation, preferably for each individual storage pile. If possible, these inventories should include pile volumes, pile weights, and weights of radioactive isotopes for each licensed isotope.

Licensee Response: Radioactive materials inventory log for calendar year 1995 is included herein as an attachment. As stated previously, the log does not distinguish between the form of materials on the inventory.

Action Taken: The radioactive materials inventory log is attached.

Quality Assurance

1. USNRC Request: What is the makeup of personnel/contractors in the SMC Quality Assurance Group discussed on page 54 of the application?

Licensee Response: The makeup of personnel/contractors in the SMC Quality Assurance Group is more fully discussed in the new license renewal application.

Action Taken: None required.

2. USNRC Request: What types of audits are expected to be performed as envisioned by proposed condition 10?

Licensee Response: Audits of the radiation protection program are described in the new license renewal application.

Action Taken: None required.

Ventilation Systems

1. USNRC Request: Are there any minimum operating requirements of the ventilation system (e.g., flow velocities, differential pressure across filters, etc.) under which operations would be required to be ceased or postponed?

Licensee Response: Operations with source material in D111 are ceased if the ventilation system becomes inoperable or performs outside of performance specifications.

Action Taken: None required.

Fire Protection

1. USNRC Request: What sources of ignition and combustibles are available in restricted areas?

Licensee Response: The primary source of ignition in restricted areas is the furnace in D111 where smelting operations take place. There are minor amounts of combustibles used in the vicinity of this operation. There are no other major sources of ignition in restricted areas.

Action Taken: None required.

2. USNRC Request: Submit an evaluation of combustion and release of pyrochlore to both the public and workers. Include statements of all assumptions. If release of such material is unlikely through fire dispersion, please explain why.

Licensee Response: The ores and slag are refractory materials that are incapable of combustion, and no flammable materials are stored or used in their vicinity.

Therefore, dispersion of source material by fire is not considered to be a credible accident scenario.

Action Taken: None required.

3. USNRC Request: What type of fire suppression equipment is available? What employee training is provided for this equipment?

Licensee Response: Hand-held extinguishers (Type A, B. C, and D) are located throughout the restricted area. Training in proper operation of hand-held equipment is provided annually by the Safety Manager.

Action Taken: None required.

4. USNRC Request: If off-site fire crews are expected to participate in fire suppression, is any training or notification of hazards provided to these personnel? Is there any written correspondence with such emergency crews (e.g., response pacts)?

Licensee Response: SMC routinely meets with the local fire and police departments to discuss general emergency response issues. On-site training and site familiarization is provided. In addition, training in any special measures that may be necessary is provided to security guards and shift supervisors that might serve as escorts for emergency crews.

Action Taken: None required.

ATTACHMENTS

URANIUM & THORIUM INVENTORY LOG FOR 1995 (YTD)

	01/95	02/95	03/95	04/95	05/95	06/95	07/95
Original Thorium Inventory (kg)	292988	294303	294690	295210	295210	295210	295210
Ore Received (kg)	187050	55100	73950				
% Th in ore	0.70	0.70	0.70				
Thorium Received (kg)	1309	386	518	0	0	0	0
CANAL Shipped (kg)	0	0	0				
% Th in CANAL	0.51	0.51	0.51				
Thorium Shipped (kg)	0	0	0	0	0	0	0
Current Thorium Inventory (kg)	294297	294689	295208	295210	295210	295210	295210
Original Uranium Inventory (kg)	39115	39527	39648	39811	39811	39811	39811
Ore Received (kg)	187050	55100	73950	0	0	0	0
% Uranium in ore	0.22	0.22		0.22			
Uranium Received (kg)	412	121	163	0	0	0	0
CANAL Shipped (kg)	0	0	0	0	0	0	0
% U in CANAL	0.10	0.10	0.10				
Uranium Shipped (kg)	0	0	0	0	0	0	0
Current Uranium Inventory (kg)	39527	39648	39811	39811	39811	39811	39811
Current Source Material Inventory (kg)	333824	334337	335019	335021	335021	335021	335021

QUARTER-2 AIR MONITORING RESULTS

QUARTER-2 AIR MONITORING RESULTS

Status	Type	Description	Date	Time (min)	Activity (dpm)	Volume (ml)	GrossAlpha Activity (uCi/ml)	Th-232 Activity (uCi/ml)	U238 Activity (uCi/ml)
Area	Background	Maintenance	11 April 1995	400.00	136.00	1.48e+07	4.14e-12	3.13e-13	2.52e-13
Area	Routine	CANAL Packaging	12 April 1995	485.00	249.00	1.80e+07	6.23e-12	4.73e-13	3.80e-13
Area	Routine	CANAL Packaging	12 April 1995	480.00	242.00	1.86e+07	5.85e-12	4.46e-13	3.58e-13
Area	Routine	CANAL Packaging	13 April 1995	515.00	173.00	1.91e+07	4.08e-12	3.10e-13	2.49e-13
Area	Routine	CANAL Packaging	13 April 1995	515.00	246.00	1.99e+07	5.56e-12	4.22e-13	3.39e-13
Employee	Routine	CANAL Packaging	14 April 1995	215.00	11.00	7.98e+06	6.20e-13	4.72e-14	3.79e-14
Employee	Background	Maintenance	14 April 1995	215.00	13.00	8.32e+06	7.03e-13	5.34e-14	4.29e-14
Area	Background	Maintenance	14 April 1995	275.00	25.00	1.02e+07	1.10e-12	8.38e-14	6.73e-14
Area	Background	Maintenance	14 April 1995	275.00	37.00	1.06e+07	1.57e-12	1.19e-13	9.54e-14
Area	Routine	CANAL Packaging	17 April 1995	465.00	34.00	1.73e+07	8.84e-13	6.74e-14	5.41e-14
area	Routine	CANAL Packaging	17 April 1995	380.00	96.00	1.45e+07	2.98e-12	2.26e-13	1.82e-13
Employee	Routine	CANAL Packaging	17 April 1995	466.00	3.00	9.05e+05	1.49e-12	1.13e-13	9.10e-14
Employee	Routine	CANAL Packaging	17 April 1995	480.00	4.00	9.56e+05	1.88e-12	1.43e-13	1.15e-13
Employee	Routine	CANAL Packaging	17 April 1995	477.00	6.00	9.64e+05	2.80e-12	2.13e-13	1.71e-13
Area	Routine	CANAL Packaging	18 April 1995	485.00	13.00	1.80e+07	3.25e-13	2.47e-14	1.98e-14
Area	Routine	CANAL Packaging	18 April 1995	485.00	46.00	1.88e+07	1.10e-12	8.38e-14	6.73e-14
Area	Routine	CANAL Packaging	18 April 1995	485.00	155.00	1.85e+07	3.77e-12	2.86e-13	2.30e-13
Employee	Routine	CANAL Packaging	18 April 1995	496.00	3.00	9.65e+05	1.40e-12	1.06e-13	8.53e-14
Employee	Routine	CANAL Packaging	18 April 1995	496.00	5.00	9.77e+05	2.30e-12	1.75e-13	1.40e-13
Employee	Routine	CANAL Packaging	18 April 1995	496.00	2.00	1.00e+06	9.00e-13	6.82e-14	5.47e-14
Area	Routine	CANAL Packaging	19 April 1995	480.00	8.00	1.78e+07	2.02e-13	1.54e-14	1.23e-14
Area	Routine	CANAL Packaging	19 April 1995	480.00	51.00	1.86e+07	1.23e-12	9.39e-14	7.54e-14
Area	Routine	CANAL Packaging	19 April 1995	480.00	80.00	1.83e+07	1.97e-12	1.49e-13	1.20e-13
Employee	Routine	CANAL Packaging	19 April 1995	466.00	0.40	9.15e+05	1.97e-13	1.49e-14	1.20e-14
Employee	Routine	CANAL Packaging	19 April 1995	464.00	1.00	9.07e+05	4.96e-13	3.77e-14	3.03e-14
Employee	Routine	CANAL Packaging	19 April 1995	489.00	2.00	9.85e+05	9.14e-13	6.94e-14	5.57e-14
Employee	Routine	CANAL Packaging	20 April 1995	410.00	3.00	8.10e+05	1.67e-12	1.27e-13	1.02e-13

Status	Type	Description	Date	Time (min)	Activity (dpm)	Volume (ml)	GrossAlpha Activity (uCi/ml)	Th-232 Activity (uCi/ml)	U238 Activity (uCi/ml)
Employee	Routine	CANAL Packaging	20 April 1995	408.00	13.00	8.06e+05	7.26e-12	5.51e-13	4.43e-13
Employee	Routine	CANAL Packaging	20 April 1995	409.00	13.00	8.18e+05	7.15e-12	5.44e-13	4.36e-13
Area	Routine	CANAL Packaging	20 April 1995	465.00	42.00	1.73e+07	1.09e-12	8.33e-14	6.68e-14
Area	Routine	CANAL Packaging	20 April 1995	465.00	137.00	1.80e+07	3.43e-12	2.60e-13	2.09e-13
Area	Routine	CANAL Packaging	20 April 1995	465.00	87.00	1.78e+07	2.20e-12	1.68e-13	1.34e-13
Employee	Routine	CANAL Packaging	21 April 1995	421.00	4.00	8.30e+05	2.17e-12	1.65e-13	1.32e-13
Employee	Routine	CANAL Packaging	21 April 1995	421.00	13.00	8.29e+05	7.06e-12	5.36e-13	4.31e-13
Employee	Routine	CANAL Packaging	21 April 1995	421.00	8.00	8.57e+05	4.20e-12	3.19e-13	2.56e-13
Area	Routine	CANAL Packaging	21 April 1995	470.00	89.00	1.74e+07	2.30e-12	1.75e-13	1.40e-13
Area	Routine	CANAL Packaging	21 April 1995	470.00	96.00	1.82e+07	2.37e-12	1.81e-13	1.45e-13
Area	Routine	CANAL Packaging	21 April 1995	470.00	145.00	1.80e+07	3.63e-12	2.76e-13	2.22e-13