

Let's protect our earth



State of New Jersey  
DEPARTMENT OF ENVIRONMENTAL PROTECTION  
DIVISION OF ENVIRONMENTAL QUALITY

CN 415  
Trenton, N.J. 08625-0415  
(609) 987-6402  
Fax (609) 987-6390

40-7102  
POR

Jill Lipoti, Ph.D., Assistant Director  
Radiation Protection Programs

June 7, 1991

Mr. Yawar Faraz  
Advanced Fuel and Special Facilities Section  
Fuel Cycle Safety Branch  
Division of Industrial and Medical Nuclear Safety, NMSS  
Nuclear Regulatory Commission  
Mail Stop 6H3  
Washington, D.C. 20555

Dear Mr. Faraz,

We have reviewed a copy of the letter sent to you by Shieldalloy Metallurgical Company (SMC) dated March 19, 1991 requesting an exemption, modification, or amendment of their source material license to allow the handling and sale of 55,920 pounds of ferrosilicon zirconium (FeSiZr). The FeSiZr was determined to contain source material greater than 0.05 weight percent thorium and uranium. We have also reviewed your response to SMC's request dated May 20, 1991. The purpose of this letter is to document our concerns and to request clarification on issues relating to the FeSiZr which is currently stored at SMC's Newfield, New Jersey site.

We understand that the NRC has allowed SMC to possess the FeSiZr under their current source material licence. This license states that SMC may possess and store up to 100,000 kilograms of thorium and up to 5,000 kilograms of uranium for use in the processing of raw materials to produce ferrocolumbium and columbium nickel alloys. Because FeSiZr is not used by SMC in these processes, it is not clear how it can be covered by their current source material license. In addition, an inspection of the site by the NRC in May 1990 (Routine Inspection No. 040-07102/90-001) revealed that SMC was already in possession of at least 150,000 kilograms of thorium and 17,000 kilograms of uranium resulting in a Severity Level IV violation.

New Jersey is an Equal Opportunity Employer

9106180280 910607  
FDR ADDCK 04007102  
C FDR

NE 11

Four other concerns regarding the discovery, possession, and sale of this material are listed below.

1. Notification of NRC

In May 1990, SMC was notified by a customer that an exposure rate spot check of a FeSiZr shipment indicated elevated levels of radiation. SMC subsequently had samples of this material tested, revealing the presence of licensable amounts of source material. To our knowledge, SMC did not notify the NRC, however, until March 1991. In accordance with 10CFR Part 21.21, an initial notification should have been made within two days of source material identification, not months later.

2. Receipt of Source Material

It is unclear why SMC is not subject to the 10CFR Part 40.51 limits on the receipt of source material in any calendar year.

3. Exposure Rate Analysis

An exposure rate analysis was performed by SMC's consulting health physicist for a full-time worker in an unrestricted FeSiZr storage area. This analysis assumed that a forklift operator would be moving 4,000 pounds of FeSiZr at a time (one pallet box) resulting in an exposure of 54.9 uR/hr. The calculations determined that the total annual dose to such a worker would range between 114 mR (8 hrs/day, 5 days/week) and 160 mR (8 hrs/day, 7 days/week). In their conclusions, SMC compared this dose to the NRC limit of 500 mR/yr for unrestricted areas (general public). They do not consider, however, that the calculated dose received by this worker is greater than the 100 mR/year revised NRC limit for members of the general public. Nor is exposure due to other pallet boxes in the area considered in their calculations.

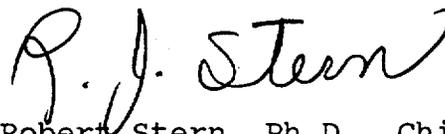
When a field measurement of a bag placed in the FeSiZr storage area on the SMC site revealed an exposure rate of 180 uR/hr at one meter, SMC explained that factors other than the FeSiZr also contributed to this measurement. These factors include background and other material stored at the SMC facility. In their conclusions, SMC stated that if "an individual were continuously present near the storage of the FeSiZr pallet boxes, the radiation levels of 2 mR/hr or 100 mR in any seven consecutive days would not be approached or exceeded." It is not clear how SMC reached this conclusion without determining exposure rates due to the other contributing factors.

4. Exposure Scenarios

SMC did not consider an exposure scenario for workers or other members of the public at the offsite warehouses where the FeSiZr was stored prior to being transferred to SMC's Newfield site. In their letter, SMC refers to these warehouses as "AA", "BB", and "CC" but does not give their location or the length of time the material was stored there. They state that 3,000 pounds of FeSiZr was stored in warehouse AA, 8,820 pounds in BB and 44,100 pounds in CC. A scenario addressing the 44,100 pounds of FeSiZr (11,025 pallet boxes) in warehouse CC should be performed.

Please provide us with your legal rationale for allowing SMC to possess the FeSiZr under their current license. In addition, we would appreciate any information that you could provide to clarify our understanding of the situation and to address our concerns. Thank you.

Sincerely,



Robert Stern, Ph.D., Chief  
Bureau of Environmental Radiation

c: Jerry J. Swift, NRC  
Marie Miller, NRC  
Patricia Gardner, Supervisor, REAS  
Donna Gaffigan, Case Manager, BFCM  
Maryanne Quinn, REAS