



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555

AUG 26 1991

Docket Nos.: 40-7102
40-8948

MEMORANDUM FOR: John W. N. Hickey, Acting Branch Chief
Fuel Cycle Safety Branch

THRU: Jerry J. Swift, Section Leader
Advanced Fuel and Special
Facilities Section
Fuel Cycle Safety Branch

FROM: Yawar H. Faraz, Project Manager
Advanced Fuel and Special
Facilities Section
Fuel Cycle Safety Branch

SUBJECT: SUMMARY OF MEETING BETWEEN U.S. NUCLEAR REGULATORY
COMMISSION (NRC) STAFF AND SHIELDALLOY METALLURGICAL
CORPORATION (SMC) HELD AT NRC HEADQUARTERS IN ROCKVILLE,
MARYLAND, ON AUGUST 14, 1991

INTRODUCTION

On August 14, 1991, Shieldalloy Metallurgical Corporation representatives met with staff members of the Division of Industrial and Medical Nuclear Safety, Division of Low-Level Waste Management and Decommissioning, Office of the General Counsel and Region III to discuss various topics regarding their Cambridge, Ohio, and Newfield, New Jersey, sites. Staff from the Environmental Protection Agency (EPA) Region V were also present as non-participants. Topics related to the Cambridge, Ohio, site that were discussed included the decommissioning of the two slag piles containing NRC licensed source material and the sampling and analysis of surface water. Topics related to the Newfield, New Jersey, site that were discussed included offsite contamination conceivably resulting from overland runoff from a lime dust pile, source material possession limits, preparation of a decommissioning funding plan, the ongoing radiological site characterization, renewal of the source material license and the leachability test recommended by the staff to be performed on the slag. The staff's position and regulatory requirements regarding these issues were explained to SMC. They were also asked to propose a plan of action related to the decommissioning of the two slag piles located at the Cambridge, Ohio, site and the reduction in the amount of source material at the Newfield, New Jersey, site.

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MEETING CONTENT

A. Cambridge, Ohio, Site (decommissioning only)

1. Decommissioning of the West Pile

NRC staff Position: The staff's biggest concern regarding SMC's application to decommission the West Pile is caused by the placement of slag and soil on the original slag pile following decontamination of the site. Originally the slag concentrations of Th-232, U-238 and Ra-226 varied from 0.4 to 3.1, 0.9 to 13, and 0.5 to 8.5, pCi/g, respectively, resulting in averages over the entire pile of 1.4, 3.0 and 2.4 pCi/g, respectively. The concentrations of Th-232, U-238 and Ra-226 in the slag and soil placed on the original pile following site decontamination varied from 0.3 to 180, 2.1 to 180, and 3.1 to 68 pCi/g, respectively, resulting in weighted averages of 42, 54, and 42 pCi/g, respectively. In order to demonstrate compliance, SMC erroneously averaged the radionuclide concentrations in the original pile (282,000 tons), the slag and soil (139,000 tons) placed on the original pile, and the proposed cover (110,600 tons) material. These averages (calculated over an area of 7.5 acres) were thus forced to concentration levels below Option 2 (50 pCi/g of natural thorium) and Option 3 (40 pCi/g of natural uranium) and almost to Option 1 concentration levels (10 pCi/g each of natural thorium and natural uranium) of the Branch Technical Position. It should be noted that averaging may only be performed over a square grid of an area of 100 m². SMC's decommissioning plan for the West Pile indicates that a large portion of the material placed on the original pile exceeded Option 2 concentrations and therefore the possibility of granting authorization to decommission and release the site for unrestricted use does not exist. To be within levels of Option 1 for natural uranium and Option 2 for natural thorium, it is imperative that no large section (i.e. greater than 100 m²) of the pile contain these radionuclides at concentrations above 10 pCi/g of U-238 + U-234 and 50 pCi/g of Th-232 + Th-228. One suggested method to achieve these concentrations would be to extract the higher concentration material, which would include more than 127,080 tons of slag and soil and dispose of the material offsite. Another alternative for SMC would be to segregate low concentration (Option 1) material and apply for insitu disposal for the remaining higher concentration material in accordance with 10 CFR 20.302. If in the application, based on a detailed pathways analysis SMC can demonstrate to the satisfaction of the NRC that the resulting dose is no greater than a few millirem, then in all likelihood insitu disposal will be authorized by the NRC. However, if the dose results in a value which is greater than 10 millirem, in all likelihood the disposal will not be authorized. SMC could also proposition for an exemption from the requirement for unrestricted release at license termination or for other disposal options under 10 CFR 20.302, the proceedings of which are fairly lengthy and the outcome uncertain. If this alternative is pursued, then SMC would be required to demonstrate to the NRC prior to its application for exemption that a reasonable chance of obtaining an exemption exists.

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SMC Response: a. SMC indicated that the radionuclide concentrations presented in the decommissioning plan were conservatively high and that there is a slight possibility that the actual concentrations are low enough to fall below Options 1 and 2. However, if the concentrations are indeed higher than Options 1 and 2, then offsite disposal would not be possible financially for SMC since the cost of disposal alone (estimated at \$1000 per cubic yard or 1 ton) would be at least \$100,000,000. This would most certainly cause SMC to go bankrupt resulting in the Government of the United States to inherit the problem.

b. Site decontamination and decommissioning was closely coordinated with the NRC. However, the problem was first indicated to SMC in April 1991, even though the site decontamination report and decommissioning plan were submitted to the NRC in January 1990, and February 1990, respectively.

c. It is SMC's opinion that the current dose levels are below background and that offsite disposal is an unreasonable requirement under these circumstances.

NRC's Response to SMC's Response: a. SMC should accurately characterize the West Pile for its radioactive content. The NRC staff is enforcing the regulations which require release of the site for "unrestricted use." Authorization for the site to be released for unrestricted use could only be granted if SMC convinces the staff that future dose impacts will be insignificant.

b. It was the staff's understanding that the radionuclide concentrations as well as the curie amounts were low enough so as not to raise the

hazardous nature of the original pile significantly. Notwithstanding this misunderstanding, the NRC was neither formally asked for, nor did it authorize SMC to add more-highly contaminated slag and soil to the West Pile, and the problem was first recognized during the review of the decommissioning plan.

c. The current direct gamma doses over the West Pile are small due to the placement of six feet of cover material whose intactness cannot be guaranteed for future times. Due to the long half lives of U-238 and Th-232, and their insoluble nature, a significant reduction in their inventories cannot be expected for hundreds of years.

2. Decommissioning of the East Pile

A conceptual decommissioning plan has been developed by SMC for the East Pile. However, its usefulness was questioned by SMC based on the NRC staff's position on the application to decommission the West Pile, since the natural uranium concentration of 21 pCi/g exceeds Option 1 of the Branch Technical Position. The Ra-226 and Th-232 concentrations for this pile (90,000 tons of slag) are estimated to be 66 and 4 pCi/g, respectively.

SMC is looking into the possibility of use of the slag as shielding for the super collider. SEG in Oak Ridge, Tennessee may show interest in this regard. SEG's use of the slag would involve a transfer of source material from one NRC licensee to another. SMC also feels that slag could have been marketed if it were not for its radioactive nature since it has a high aluminum content.

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SMC claimed that offsite disposal of the East Pile slag in a low-level waste site or even in a uranium mill tailings site is financially not possible. SMC was interested in knowing if any other NRC licensed sites were undergoing similar scrutiny.

3. Decommissioning Funding Plan

SMC was informed that a sitewide decommissioning funding plan will be required at the time of renewal of the source material license SMB-1507. An application for renewal of the license is expected to be received by the NRC from SMC before May 1992.

4. Surface Water Sampling and Analysis

EPA Region V sampled surface water and sediment in April 1990 from a stream that runs through SMC's property. Ten water and nine sediment samples were obtained and analyzed for gross alpha, gross beta, and gross gamma radiation. For gross alpha, the results varied from 0 to 5621 pCi/l with four samples exceeding the EPA action level of 15 pCi/l. For gross beta, the results varied from 1 to 476.3 pCi/l with eight samples exceeding the EPA action level of 50 pCi/l. The highest water concentrations observed were in a sample obtained upstream from the SMC facility. For this reason SMC claims that the most likely sources of surface water contamination are the strip mines located upstream from the facility. In response to the EPA report, SMC was requested to perform a more comprehensive surface water sampling and analysis by the NRC in February 1991. SMC's written response is expected before September 15, 1991. According to SMC the surface water sampling and analysis plan included in the West Pile decommissioning plan would be followed only after the decommissioning of the West Pile is authorized by the NRC. The status of EPA's resampling of the surface water is not known at this time. NRC staff indicated that SMC should determine if the surface water is indeed contaminated by characterizing the stream. Results of the characterization will also determine if the two slag piles are additional sources of contamination. The most probable transport pathway would be overland runoff since the stream is in close proximity to the piles.

5. Responses to NRC Comments

The responses to the NRC comments of September 1990 and February 1991, which were due before June 1, 1991, are being prepared by SMC's consultant ENSR. SMC committed to submitting the responses before September 15, 1991.

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B. Newfield, New Jersey Site (actively processing source material)

1. Offsite Contamination

The most likely pathway and source of contamination beyond the fence line appears to be overland runoff from the lime (bag house dust) pile which contains low concentrations of source material radionuclides. Sample analysis is underway and the results are expected from Eberline soon. A report containing the results will be prepared by ENSR, which will be published one month after the data is received. SMC will also perform a risk assessment of the offsite contamination. Remediation of both the radiological and chemical contamination will be evaluated. Following cleanup, the source will be stabilized. No measures have been taken so far to keep additional low-levels of radiological contamination from being transported offsite.

According to New Jersey's Department of Environmental Protection (NJDEP), slag may have been used on the dirt road that goes from the site between the houses to Weymouth Road. This was indicated by the higher than background dose levels observed by Oak Ridge Associated Universities (ORAU) in their survey. According to SMC, slag from the dirt road was retrieved and added to the slag pile. However, SMC pointed out that a fenced pump house, which has been shut down due to chromium contamination, was built using slightly contaminated slag. The pump house will be remediated by SMC to bring the contamination levels down to acceptable levels.

2. Possession Limits

In existing license SMB-743, granted to SMC in July 1980, possession up to a maximum of 100,000 kilograms of thorium and 5,000 kilograms of uranium is authorized. In the license renewal reapplication submitted in July 1988, SMC anticipated possessing 750,000 kilograms of thorium and 155,000 kilograms of uranium by July 1993. These amounts correspond to 165 curies of thorium and 105 curies of uranium. In February 1991, SMC possessed about 543,000 kilograms of thorium and 112,000 kilograms of uranium. A Severity Level 4 violation was given to SMC for exceeding the possession limits.

NRC is in the process of granting authorization to SMC to possess up to 750,000 kilograms of thorium and 155,000 kilograms of uranium with the condition that these limits will not be exceeded in future. On the contrary, NRC has requested SMC to propose a plan which would reduce these limits over time to "manageable levels" considered by NRC staff to be 150,000 kilograms of thorium and 30,000 kilograms of uranium. The NRC wants to avoid a future situation requiring SMC to dispose of large quantities of low level waste at the time of cessation of operations. It is NRC staff's opinion that an acceptable proposition would be if the possession limits of 750,000 kilograms of thorium and 155,000 kilograms of uranium are maintained up to the year 2000 followed by annual reductions of 40,000 kilograms of thorium and 8,000 kilograms of uranium over the next fifteen years.

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The decommissioning funding plan, which is required to be submitted and approved before the license is renewed, will be consistent with SMC's proposed scheme of reduction of the possession limits, or SMC should demonstrate to the satisfaction of the NRC that the slag will be removed by other means, such as being sold.

It was SMC's opinion that it does not have the means to fund offsite disposal of slag and that operations will have to cease once the possession limits are attained. This would hamper substantially the use of niobium in American industries since SMC supplies about 75 percent of it. SMC may seek congressional action in this matter.

3. Compliance with 10 CFR Part 20

NRC staff requested SMC to provide a plan before March 31, 1992 which would demonstrate compliance with the stricter limits contained in the proposed 10 CFR Part 20 which will become effective after December 31, 1992. Compliance with EPA's National Emission Standard for Hazardous Air Pollutants (NESHAPS) (presently in abeyance) should also be considered. SMC agreed to submit a plan before the requested date and feels that the perimeter air sampling should be sufficient to demonstrate compliance with the 10 millirem EDE being proposed by the EPA.

4. Decommissioning Funding Plan

The decommissioning funding plan is required to be submitted and approved prior to action on the license renewal application which is expected no sooner than the end of 1992. A submittal date of September 30, 1992 was proposed by the NRC and accepted by SMC. The plan should be detailed enough to demonstrate accurately the cost of decommissioning. SMC's plan to reduce its possession limits is required prior to the submittal of the decommissioning funding plan. Financial assurance should be in accordance with Regulatory Guide 3.66 and should include site decontamination. Site cleanup should be down to currently enforced concentration guidelines. Any future modifications to the guidelines would most probably not be applicable to the decontaminated regions as far as the NRC is concerned.

5. License Renewal

The license renewal application has been reviewed. NRC staff comments will be provided along with those related to the site characterization report whose submittal is expected in September 1991. SMC may be required to submit change pages or a revised application based on the review. A safety evaluation report (SER) and an environmental assessment (EA) will be prepared by the NRC. These reports will be based primarily on the information contained in the renewal application and the characterization report. It is expected to take about a year to prepare and publish these reports. The SER is anticipated to be prepared in-house while an NRC consultant will prepare the EA. Since the costs of these two reports will be borne by SMC, it will be in SMC's interest to provide any additionally needed information promptly and accurately. SMC requested sample copies of these documents so as to have an idea of the type of information they may contain.

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6. Leachability Test

It was recommended by the NRC staff that SMC conduct a leachability test in accordance with ANSI Standard 16.1 for a sample of the slag being temporarily stored onsite. Samples of the slag were obtained from freshly processed ore on July 17, 1991 and testing began at the end of the month. The results will be available in November of 1991. According to SMC, the sampled slag represents 95 percent of the slag currently being stored onsite. SMC was informed that decisions cannot be based solely on the results of the test since it does not mimic actual environmental conditions. However, the results will provide the NRC staff with an idea of the leachable nature of the contained thorium, uranium and radium.

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Yawar H. Faraz, Project Manager
Advanced Fuel and Special
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Enclosure: Attendee list

Attendees of meeting between Shieldalloy and NRC at OWFN on August 14, 1991

NAME	TITLE	AFFILIATION	PHONE #
Jerry J. Swift	Sect Ldr. Advanced Fuels & Special Facilities	US NRC, NMSS	301 492 0609
Mike Finkelstein	Attorney	U.S. NRC, OGC Rulemaking + Fuel Cycle	(301) 492-1623
GARY C COMFORT	Asst. Project Manager	USNRC/NMSS	(301) 492-0667
David R Smith	Director of Environ. Services	SMC	(609) 692-4200
Howard Larson	Engr	ACNW	301/492 7707
Keith McConnell	Geologist	USNRC/Region III	708/790-5637
Joe Cisneros	On-Scene Coordinator	U.S. EPA	312-353-1409 202-382-7731
Nancy-Ellen Zusman	Office of Regional Counsel	U.S. EPA/Region I	312-886-7161
Verneta Simon	On-Scene Coordinator	USEPA Region V	312-886-3601
John Austin	ATTORNEY	Counsel for Shieldalloy	202-625-3112
CRAIG RIEMAN	RSO	SHIELDALLOY	609 692 4200
Robert L. FOWLER	OGC/NRC		301 492-1664
John Hickey	NRC/FLSB	NRC	301-492-3330
Tim Johnson	SECTION LEADER NRC/LLDR	NRC	301-492-0550
JOHN GREEVES	NRC/NMSS		301-492-3330
Yawar Faraz	Project Manager NRC/NMSS/INMS	NRC/NMSS	301-492-0669

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