

Shieldalloy Corporation

A SUBSIDIARY OF METALLURG, INC.

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CABLE REGISTRATION
SHIELDALOY

January 10, 1978

Mr. Robert O. McClintock, Chief
Materials Radiological Protection Section
Nuclear Regulatory Commission
Region I
631 Park Avenue
King of Prussia, PA 19406

Re: License No. SMB-743
Inspection No. 77-01
Docket No. 40-7102

Dear Mr. McClintock:

We are in receipt of your letter of January 3, 1978. This letter stated that there might be a violation of 10CFR20.201 (b). This regulation requires the making of such surveys (evaluations) as may be necessary for us to comply with all sections of Part 20. You also stated "as of December 13, 1977, you have failed to make such surveys as were necessary to assure compliance with 10CFR20.106, 'Radioactivity in effluents to unrestricted areas,' ... however, [the] evaluations are inadequate in that they fail to evaluate the concentration of thorium which is released to the unrestricted area in the air leaving the filter house."

In our discussions with your Mr. Costello, we apparently failed to adequately explain the thorium emission aspect as delineated by Dr. Silvernail in Technical Project Report SC-TP-0176 dated February 21, 1977. Shortly after Mr. Costello left our plant, we once again carefully reviewed this section of Dr. Silvernail's report. It is obvious that the thorium emission problem was most thoroughly covered by Dr. Silvernail. We refer you to Page III-6, Part 3, Section A - Particulates.

Mr. Costello informed us that a letter would follow our discussions noting that a discrepancy had developed during our discussion concerning the thorium situation. At the time of our inspection, we did not imagine that the point would be subsequently termed an "infraction." Perhaps if such had been the case, a more concerted effort by Dr. Silvernail and others attending the meeting would have been made to clear up the problem. We don't really

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feel that this aspect is in violation of 10CFR20.201 (b). We feel that we are in full compliance with the regulations and present the following discussion and analysis of our position:

According to Part 20, Appendix B, Table II, Column 1, the MPC for natural thorium is $2 \times 10^{-12} \mu \text{ Ci/ml}$, which is equivalent to $5.66 \times 10^{-8} \mu \text{ Ci/ft}^3$. Annualized, this is equal to an allowable emission of $4.47 \times 10^3 \mu \text{ Ci/year}$. Let us work with assumed data as follows:

2,650 lbs. Pyrochlore per heat (present "normal" practice)
8% of material up stack (8x Dr. Silvernail's estimate)
0.8% Thorium content in Pyrochlore (2x actual value)
98% baghouse efficiency (well below actual value quoted
by manufacturer)

Please note that most of the above are considerably more "adverse" than actual data or estimates.

In this situation, 212 lbs. of Pyrochlore would report to the stack per heat. This corresponds to 1.7 lbs. of thorium going up the stack per heat, which, in turn, means 168 microcuries are going to the stack per heat. Assuming 98% efficiency in the baghouse, only 3.36 microcuries are emitted to the atmosphere per heat. Using these figures, we could produce 1,330 heats per year of Ferrocolumbium and still not exceed the total allowable yearly amount of 4,470 $\mu \text{ Ci}$. We fire an average of 960 heats per year. For example, in fiscal 1977 we fired 949 heats which is well below this figure. As was pointed out in Dr. Silvernail's report, we are now exclusively using Niobec Pyrochlore which, when analyzed by Ledoux, was found to have 0.4 percent Thorium. Our baghouse is conservatively estimated at 99% efficiency. Therefore, using the 0.4% Thorium value and baghouse efficiency of 99%, we would be able to produce considerably more than 1,330 heats making it even more difficult to exceed the yearly amount.

10CFR20.106, Part (d) states: "If the conduit discharges within the restricted area, the concentration at the boundary may be determined by applying appropriate factors for dilution, dispersion, or decay between the point of discharge and the boundary." Since the baghouse is 400 feet from the nearest property line, it would also be possible to add a dilution factor per the above paragraph. Adding this dilution factor strenghtens our argument further that there is no chance of our discharging over the allowable yearly amount.

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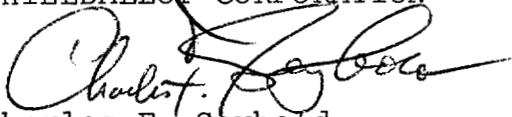
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We sincerely hope that the above discussion in conjunction with Dr. Silvernail's presentation has shown that we are in full compliance and that there is no way our present operation could violate 10CFR20.106.

We trust we have cleared up this matter to your satisfaction. If you have any questions concerning this discussion or any other aspects of the Shieldalloy Radiation Safety Program please feel free to contact me at 609-692-4200, extension 205.

Yours truly,

SHIELDALLOY CORPORATION


Charles F. Seybold
Vice President

CFS/ljb