DOCKET NO. 40-1917

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KERMAC NUCLEAR FUELS CORP.

Kerr-McGee Building • Oklahoma City 2, Oklahoma

February 28, 1963

DOCKETED USAEC Division of Licensing & Regulation MAR 8 1963 Docket Officer

Mr. R. Lowenstein, Director
Division of Licensing and Regulation
U. S. Atomic Energy Commission
Washington 25, D. C.

Dear Mr. Lowenstein:

This letter is for the purpose of reporting exposure of employees of Kermac Nuclear Fuels Corp. to airborne concentrations in excess of maximum permissible concentration in accordance with Part 20 of Title 10 of the Code of Federal Regulations.

The personnel, all of whom have been notified of the excessive exposure, and the concentrations of exposure are as follows:

Name	Period	Average Air Concentration
Dickerson, Jean	Jan. 1-28, 1963	56.40×10^{-11} mc/ml
Scrubow, Daniel	Jan. 5-Feb. 1, 1963	88.70 "
Cain, Jerry	Jan. 1-28, 1963	19.18 "
Herrenbruck, Stanley	Jan. 1-28, 1963	15.88 "
Gibbs, Thomas	Jan. 1-28, 1963	9.85 "
Trease, Mike	Jan. 1-28, 1963	15.20 "
Bell, Floyd	Jan. 1-28, 1963	8.04 "
Aragon, Richard	Jan. 1-28, 1963	18.50 "

The high concentrations received by Scrubow and Dickenson was due in great part to their carelessness during operations. Mr. Scrubow's total time in the area was much less than that of Cain, Dickerson or Herrenbruck. Dust masks were worn by the employees at all times while in the area and other corrective measures were taken to lower concentrations of airborne dust. It was not until receipt from the laboratory of all assays of the breathing zone samples in early February that full realization was had of the overexposure.

The overexposure occurred while experimenting with packaging procedures and operations in the yellowcake packaging department of the Kermac mill to develop

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a satisfactory method for packaging the yellowcake in a manner that would assure a moisture content meeting the requirements of the Atomic Energy Commission. The experimental work has been concluded and a safe, satisfactory packaging procedure has been established.

On December 26, 1962, Mr. Jack Robison, General Manager of the Kermac plant, received a letter dated December 19, 1962 from Mr. W. Spencer Hutchinson, Jr. relative to the moisture content of uranium concentrates delivered to the Commission. The problem was discussed further with Mr. Facer of the Atomic Energy Commission during his January visit to the mill with Messrs. Stanley, Woody and Logan of Kermac participating in the discussion. At that time, Mr. Facer transmitted a copy of a letter from Mr. Ziegler of the Weldon Spring sampling plant, pointing out that certain Kermac lots contained excessive moisture and particle size. Copies of the above correspondence are attached.

The problem undoubtedly originated several months past when the change was made to fill yellowcake drums through the center bungs with tightly sealed lids; a measure which was taken to further minimize radioactivity from airborne dust in the packaging area. The method of filling drums under sealed conditions does not allow the moist air entering with the yellowcake to become displaced or diluted with air of lower moisture content. Consequently, under certain conditions, moisture would condense on the lid and drop to the surface of the yellowcake, causing the formation of soft balls. Sometimes caking on the sides of the drums occurred. The latter effect was the main concern at the Metropolis Refinery causing great difficulty in cleaning the drums. Mr. Facer commented that the AEC was concerned with this aspect of the problem because they were paying twice for U_3O_8 sandblasted from drums and because of increased handling and sampling problems and costs.

The only recourse immediately available to meet the requirements of Weldon Spring was to inspect each drum before shipment. The procedure adopted was to raise the lid and inspect it and the contents for excessive moisture. The contents of rejected drums were shovelled into the packaging area sump for recycle. A special breathing zone sampling program was instigated immediately to check the effect of the above changes in procedure. As soon as it became evident that the dust levels were excessive, a program of rotating personnel in the packaging area was instigated and corrective measures were undertaken to lower the concentrations of airborne dust.

Corrective Measures

Several steps were taken either concurrently or in rapid succession to improve

conditions, including:

1. Improved dewatering at No. 3 filter station, and

2. Several changes in packaging procedures which are described in more detail below in more or less chronological order.

Since dust sampling disclosed that a significant quantity of yellowcake dust arose during the loosening and raising of the drum lid, the tight lid center bung loading was abandoned in favor of loading with an earlier type loose fitting lid that was fixed to the loading station. The drum would then be closed and sealed after being moved out from under the barrel loading facility.

Next, the lid, fixed at the loading station, was fitted with a stack extending up into the hood, which by eductor action, carried out the escaping dust during barrel loading rather than permit it to come out of the barrel around the loose fitting lid.

The next loading technique tried was to return to the center bung with tight lid system that was initially blamed for the unacceptable product. This solved the major dust problem. Numerous modifications were successively tried leading to those now in use. Briefly, the system, with modifications, is as follows:

A sampler is located in the auger conveyor ahead of the barrel loading stations that permits visual inspection of the product through a plexiglass tube. The sample then passes on through the tube into a closed tank where water is added, washing the yellowcake sample into a sump. The earlier center bung with tight lid method for filling the barrels is followed. A vacuum line has been installed for cleanup of yellowcake spills on the drum lid, and the bung is loosely screwed into the lid before the filled barrel is moved from under the hood at the filling facility. After the filled barrel has been moved out onto the central roll conveyor, a hose from the exhaust system is fitted into the open bung in the lid. A supply of low pressure, low velocity air is supplied into the air space above the product in the barrel. This air and vacuum work together to carry out the air and reduce condensation to within tolerable limits.

If visual inspection at the sampling tube indicates an increase in moisture content, then a sample can be taken for a rapid moisture determination and suitable corrective measures taken.

This procedure seems to be satisfactory, yielding a product that appears to be acceptable while concentrations of airborne radioactive material are contained within permissible limits. Future developments may dictate a change in this

procedure or its complete abandonment in favor of another that is more suitable. The effort to further lower the concentration of airborne radioactive material, however, is a continuous one.

Very truly yours,

KERMAC NUCLEAR FUELS CORP.

Paul B Martin

Paul B. Martin

PBM:fb

cc: Atomic Energy Commission
Manager, Albuquerque Operations Office
P. O. Box 5400
Albuquerque, New Mexico

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(R 1-55)

U. S. ATOMIC ENERGY COMMISSION
IDAHO OPERATIONS OFFICE
HEALTH AND SAFETY BRANCH
IDO H & S SAMPLE RECORD SHEET

Serial No. _____

ROUTINE X SPECIAL ____

Sample from: KERMAC

Collected by: N. P. ALLEY

Date submitted: 5/4/64

Samples Received: _____

Analysis Completed: _____

Analyzed by: _____

Method: End Window ___ ; Prop. counter ___ ; Spectrophotometric ___ ; Fluorometric ___ ; Polarographic ___ .

Sample No.	Date	Hour	Sample Description	Anal. for	Quant. used, ml.	U $^{+6}$ or K^{+} Trans.	Count time, min.	Total Count.	Gross Count, c/m.	Bkgd., c/m.	Net count, c/m.	K^{40} corr., c/m.	Foreign activity	
													c/m.	d/m.
Potable			Milll Potable water	Ra-226										
				Th-230										
C-3			Well adjacent to Tails	Ra-226										
				Th-230										
D-4			Well adjacent to Tails	Ra-226										
				Th-230										

Notified: ___ _____ Time: _____ Resampling recommended: Yes ____ No ____

Approved: _____
Chief, Analysis Section