STANDARD FORM NO. 64

Office Memorandum • UNITED STATES GOVERNMENT

TO : Isotopes Div. Files

DATE: May 31, 1955

FROM : James W. Hitch

SUBJECT: VISIT TO CARBIDE AND CARBON CHEMICALS COMPANY, SOUTH CHARLESTON, WEST VIRGINIA, ON APRIL 18, 1955

On the morning of April 18, the writer, accompanied by Mr. George Wilson, Chief of the Industrial Hygiene Div. of the West Virginia State Dept. of Health, visited the above company for the purpose of reviewing their radioisotopes program. The program at this company is mostly that of density gauges containing either cobalt or cesium for the measurement of levels of chemicals in tanks. There is some carbon 14 being used in the Research Dept. and there is a possibility that other isotopes will be used in the Process Development Lab. This particular lab. is considering the use of a large source of radioactive cobalt, approximately 1000 curies, for the purpose of irradiation studies and possibly other isotopes later.

The people with whom we discussed the program at this company were as follows:

Dr. Frank D. Young and
Mr. W. S. Skraba of the
Research Dept.

This department is using low levels of carbon 14. Mr. Skraba formerly worked at ORNL for about 7 years in the Dept. of Chemistry.

The Special Instrumentation Dept., headed by Mr. C. G. Fellows, was the first department visited. Personnel at this company with whom we discussed the program were Mr. Fellows, Mr. L. J. Reigers and Mr. R. G. Zopp. Mr. J. R. Barnhill of the Safety Dept. conducted us on our tour of both of the departments.

Mr. N. H. Ketchen, Industrial Hygiene Head of the entire company and Mr. J. F. Haskin discussed the possibility of using a high specific activity cobalt source for gamma irradiation studies. This particular lab. is only in the thinking stage and they are discussing it with Mr. Art Rupp of the ORNL. Their plan is to use around 1000 curies of cobalt in a 7 ft. tank of water. The material to be irradiated would be immersed in the water for a period necessary to achieve the radiation desired.

This company does not have a Radioisotopes Committee, however, both Mr. Barnhill and Mr. Ketchen are to be made aware of all isotopes used in the plants. They are interested for the purpose of safety, and will advise against the use of the isotope unless

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sources is by means of shields containing the sources; no significant exposure is necessary.

Personnel Monitoring

Victoreen pocket dosimeters are used for monitoring of all handling of cobalt and cesium.

Other Monitoring Instruments

They have a Victoreen 247 ionization chamber which is used for monitoring of all handling, in addition to the personnel monitors. They also use this instrument to establish safe working levels wherever isotopes are stored.

Warning Signs

There was an abundance of warning signs at the Special Instruments Lab. whenever significant radiation hazards are noted. The only radiation signs in their Research Lab. was that near the can containing waste material.

Waste Disposal

The Special Instruments Lab. has not had any radioactive waste to dispose of. They have debated sending material to Oak Ridge National Lab. when and if they do have need for such services. The Research Lab. has small solid waste of carbon 14, the Research Lab. incinerator is employed for disposal. Dr. Young reports that they are using NBS Handbook 53 as a guide; the levels disposed of are much lower than those permitted in the handbook.

Records

The only records of exposure noted were those in the Special Instruments Lab. Mr. Rodgers maintains a log book of exposures on personnel; the highest exposure in a handling incident has been 55 mr. This involves several hours of work around the source and occurs maybe once in a month or more. Records of exposure are not kept at the Research Lab. since personnel monitoring is not feasible. They do not employ a lab. monitor SU-10 for monitoring of all operations. In addition, an Applied Physics vibrating reed is used for analysis purposes, therefore, it would seem that no exposure would occur in this operation.

Summary

My impression with people at this company is that they are exercising more than adequate precautions in the use and handling of radioisotopes.

it appears that safety precautions will be observed.

Handling Equipment

The handling equipment used at this company is primarily that provided by the OHmart Corp.; that is, the shielded sources are received in a camera-type shield for installation and are not necessarily removed from the shield prior to installation. The Research Lab., using carbon, employ equipment which is normally available in an ordinary chemistry laboratory. Most of the material is contained within the reaction train inside a California type hood.

Laboratory Facilities

The facilities in the Research Dept. are the only real laboratory facilities for handling radioisotopes that we reviewed; however, the laboratory and the special instrumentation group was primarily for electronic instrumentation and was suitable for handling sealed sources as are needed at this particular installation. There were 2 large shields containing radiocobalt sources which were in storage. They did not anticipate using the cobalt in the near future; however, they had been obtained for the purpose of experimentation with density gauges prior to the availability of cesium.

Shielding in these cesium gauges appeared to be adequate for the installation as noted. In one area which was not available to ordinary workmen the radiation level was around 8 to 9 mr/hr; however, this area was posted with warning signs so that there seemed to be no additional shielding required.

Ventilation

The only ventilation pertinent to the program was that of the Research Laboratory where approximately 500 cu. ft. of air per min. is discharged from the fume hood; this is a matter of precaution should the reaction train be broken containing the carbon 14. This hood was well designed and quite appropriate for the type of operation being carried on.

Handling Procedures

Isotopes handled in the Research Lab. was carbon only and the handling procedures seemed to be quite adequate. There was no indication, according to the report, that any accidents had occurred causing undue contamination. In case of the Special Instruments Dept., sources are removed from the density gauges at times whenever work is to be performed around the tank. This minimizes the possibility of workmen becoming overexposed to radiation. The handling of these

They have had Art Rupp up a time or two to advise them on isotope applications. They have received suggestions regarding health-safety precautions, which Mr. Rupp reported as being required by the AEC. Dr. Young and a Mr. Mills have attended an ORINS Basic Techniques Course and it is anticipated that Mr. Haskin will attend another course in the near future. Mr. Barnhill and one other person is slated to go to Oak Ridge next week to discuss isotope techniques with ORNL personnel. It seemed that the two Carbide organizations have rather close contact with each other. My observation of handling procedures and results of discussion with these people indicate that they have a very cautious attitude with respect to exposure from isotopes and that they will take adequate precautions to prevent undue exposure. They have a permissible limit of 100 mr/wk which is 1/3 that established by the NCRP.

Form AEC-352 9/53	U. S. Atomic Energy Commission RADIOLOGICAL SAFETY REPORT AND INSTRUCTION	Report Number

Name and Address of Institution	Department(s) Visited
Carbide & Carbon Chemicals Co. South Charleston, West Virginia	Special Instrumentation and Research Dents.

Name and Title of Individual User(s) Visited

C. G. Fellows, L. A. Rodgers, S. P. Spracklen (Special Instrumentation Dept.)
Dr. Frank G. Young and A. J. Skraba (Research Dept.)

Types & Levels of Radioactivity Authorized	Types & Levels of Radioactivity in use or on hand
300 mc Cs 137 200 mc Co 60 11 mc C 14	Approx. same levels of Cobalt & Cesium. Microcurie levels of Carbon.

On April 18, 1955 your facilities and procedures for maintaining radiological safety were observed by a representative of this office and at that time appeared to be satisfactory, marginal, or unsatisfactory, for the types, amounts, and uses of radioisotopes currently authorized, as indicated in PART 1. If unsatisfactory conditions existed, instructions for correction are issued in PART 2 (reverse side) by the Director, Isotopes Division.

PART 1—RADIOLOGICAL SAFETY REPORT

	Satisfactory	Marginal	Unsatisfactory
1. Handling Equipment (tongs, pipettes, devices)	X		
2. Laboratory Facilities	X		
3. Shielding	X		
4. Ventilation (including hoods, closed systems)	X		
5. Storage Facilities	X		
6. Radioisotope Handling Procedures	X		
7. Film Badges, Dosimeters, Pocket Chambers	X		
8. Other Monitoring Instruments	X		
9. Radiological Monitoring Procedures	X		
10. Warming Signs	X*		
11. Waste Disposal	X		
12. Records	X		

Comments and Recommendations: * Company uses 100 mr/wk as permissible limit.
Suggested re-location of radiation sign on the one density gauge in use.

Date

Chief, Radiological Safety Branch,
Isotopes Division

(JNM)
8-2-56

Mr. H. L. Cook, Ohmart Corporation, on tie line Cincinnati, Ohio, Phone Parkway 1-2302 RE: Control No. 1612, Carbide and Carbon Chemicals Company South Charleston, W.Va. for a 600 mc Cesium 137 source. This request had been submitted to us by CCC's Mr. G. S. ~~Gibbons~~, Works Purchasing Department by his letter of July 20th. They had not submitted a 313b and therefore questioned Mr. Cook concerning this installation and source. He stated that the Ohmart Corporation was completely unaware of this application but he did know who Mr. Rogers was and suggested that I write to him for this additional info. and that he would contact Rogers also in order to assist him in answering our letter. He did not know whether or not this particular source was one which ~~he~~ we had previously exempted from leak test requirements either.

Mr. Cook requested that I check our files to see if the Hughss Aircraft Corporation of Culver City or Los Angeles Calif. had submitted an application for a Sr 90 source. Informed him after a hurried check that we had not received such an application. After completion of the phone call checked and found where Hughes Aircraft had submitted an application for a Tracerlab source containing Ruthenium 106 about a month ago and it is suspected that Tracerlab obtained the sale after they had ~~he~~ decided against purchasing the Ohmart Sr 90 source.

(LRR)
8-14-56

Call to Mr. ~~H~~ S. ~~Gibbons~~ Givens who referred me to Mr. L. J. Rogers the individual user stated on Application Control No. 1612. Mr. Rogers informed me that they desire a total of 600 mc of Cs 137 composed of 4 - 100 mc sources, LAB Dwg. 236 in a SHRM source holder and 1 - 200 mc source LAB 236 in the SHRH source holder. Mr. R. informed me that area where sources are used are posted with caution radiation signs although the radiation level is below 6.25 mr/hr. Since these sources are exempted from leak testing we requested Mr. R. to complete items 1, 2 and 3 of 313b in confirmation of our telephone call. We agreed to process the application and issue license.