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CARBIDE AND CARBON CHEMICALS COMPANY

A DIVISION OF
UNION CARBIDE AND CARBON CORPORATION

RESEARCH DEPARTMENT

SOUTH CHARLESTON 3. W. VA.

March 21, 1957

RGP

Mr. James W. Hitch
Assistant Chief
Byproduct Licensing Branch
Isotopes Extension Division
of Civilian Application
Oak Ridge, Tennessee

Re: IER:RGP (2190)

Dear Mr. Hitch:

The following information is supplied as requested in your letter of October 18, 1956 in support of our application for a Byproduct Material License for 1.2 million curies of cobalt-60.

The numbered items refer to individual requests of your letter:

- 1) The sketch of the cell; drawing SK-63599 is numbered from 1 to 10 in red. Calculated gamma ray doses accessible only to radiation workers are given in item 10(b), 3 on page 2 of the original application with the exception that point Number 6 should be revised as follows:

<u>Number</u>	<u>Location</u>	<u>Dosage mr/hr</u>
6	Area at roof directly over source	0.52

Since the South side of the shield is below grade as indicated the dosage is no longer given for this area.

E-12

Drawing SK-61538 gives the location plan for the facility and the dosage expected at points numbered 11 through 14.

In an inset to this sketch the location, elevation of roof, and distance to the proposed cobalt-60 source is indicated. These buildings are all within the plant area. There are no buildings in the area to the east of the proposed location, and this area is entirely within Company property.

- 2) Details of the mechanism for moving the source are given in the enclosed R. V. Harty Co. drawings 1 and 2. Specifications are included in "Specifications for Source Elevator for Special Laboratory Building No. 772".

The source rack assembly is detailed in Drawing A-4020. This rack will be fixed to the source elevator.

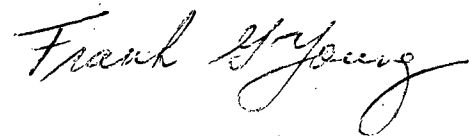
- 3) The emergency plan of action is given in item 3. The sketch of the source storage box is in Drawing SK-63599. Drainage of the well is given in SK-62446. You will note that the "pit" drainage line is brought to ground elevation and water in well is discharged to drain line through a sump pump. Failure in pump or exposed drain line will therefore allow retention of water level. In event of some failure below normal water level it is planned to supply water to well necessary to maintain level to normal and transfer source to lead storage container under water at all times. Exposure to personnel will thus be kept at or below weekly tolerance.

- 4) Written administrative instructions are given in the enclosed "Manual Governing the Control and Use of Radioactive Materials-Location 514".
- 5) Information regarding the seal on the stainless steel source pencils is contained in the enclosed Bulletin KC-1 published by Atomic Energy of Canada, Limited. Mr. Lester B. Rogers, Chief of Byproduct Licensing Branch, has approved these slugs in a letter to Mr. C. H. Hetherington, Atomic Energy of Canada, Limited ~~in a letter~~ dated July 31, 1956. Additional information was sent to your office by Mr. Hetherington early this year.

We trust that this delay in providing you with necessary supplementary information will not delay unduly consideration of our application for license.

If you require any further information please let me know.

Very truly yours,



Frank G. Young

FGY/s

Enclosures *OK*

47-260-4

DESIGN AND CONSTRUCTION
CARBIDE AND CARBON CHEMICALS COMPANY
A Division of
UNION CARBIDE AND CARBON CORPORATION

SPECIFICATIONS FOR SOURCE ELEVATOR

FOR

SPECIAL LABORATORY BUILDING NO. 772

RESEARCH LABORATORY

FEBRUARY 18, 1957

SOUTH CHARLESTON
WEST VIRGINIA

Item 2

SPECIFICATIONS FOR SOURCE ELEVATOR

Property Numbers for Items
Elevator: 6514-964
Electric Motor: 6213-13061

Intent of Specifications

It is the intent of these specifications to cover the design and installation of a device to raise and lower the radio active source in the storage well shown on plans sheets A-372000 and A-372001. Equipment shall be R. V. Harty Co. No. 200 Source Elevator.

The elevator manufacturer shall supply and deliver all materials required for the elevator to the job site and shall supervise erection. The elevator manufacturer shall be held responsible for getting to the other contractors involved on the job, the necessary information, materials and instructions for the timely performance of their work in connection with the installation of this device.

Work By Others

The following work shall be done by others:

- (1) Construction of the concrete well, the setting of all anchor bolts, other material, and the hoist mechanism box furnished by the elevator manufacturer.
- (2) Furnishing and placing all conduit including conduit for emergency pull cable and all wire and material necessary to wire up the elevator in accordance with wiring diagram furnished by the elevator manufacturer.
- (3) Erection of all material furnished by this contractor as per instructions of elevator manufacturer.

Materials

All elevator materials in the water well shall be type 304, 18-8 stainless steel. Possible exceptions such as bearings etc. shall be noted on drawings.

Elevator Platform

The platform shall be made of 304 Stainless Steel. The top shall be 3/8" plate with 16 holes 3/8" diameter, drilled and tapped and spaced approximately 6" on center.

Elevator Platform (Continued)

Provide 4 angle legs to support platform, and provide a hydraulic check on the bottom of each leg to prevent shock when platform is dropped to the bottom of the well.

Provide platform with a special pick up which shall engage the lift chains and shall, at the top of its travel, release itself from the lift chains and lock the platform in the "Up" position.

Provide suitable rollers and guide shoes to ride on platform guide.

Provide platform with suitable braces to carry a load of 200 lbs.

Platform guides shall be of stainless steel angles adequately tied to the wall of the well.

Hoist Mechanism

Hoist in the well shall consist of stainless steel endless roller chains with a breaking strength of at least 3,000 lbs. each, connected together at one point by a 1/2" bar. Chain shall run over stainless steel sprockets top and bottom. Bearings at bottom shall be for water lubrication. The top bearings shall be special and provided with lubricant that will not be affected by a radiation level of 15,000 curies C060.

Hoist mechanism in the well shall be designed so that it can be removed with the platform remaining at the bottom of the well.

Hoist shall be driven by a shaft extending out through the side of the cell under the floor to a hoist machinery box. This box is to be made of steel and be water tight.

This box shall contain the hoist mechanism consisting of a torque motor of not less than 60 oz. ft. torque, and a spur gear reduction box driven by the motor by means of a V belt. This box shall also contain a rotary type limit switch to control the travel of the hoist chain.

The elevator manufacturer shall:

Provide a silica gel container with a plastic window in the cover of this box.

Provide push buttons, resistors, box etc., required for the operation of the hoist. Resistors shall be of a size to adjust the torque of the motor from 25% to 100% torque.

Provide specifications for a reversing starter which is to be part of the electric motor control center furnished by C. & C.C.Co.

Hoist Mechanism - Safety Provisions

The elevator manufacturer shall:

Provide a method of releasing the platform and dropping it to the bottom of the well by pulling a handle fastened to a cable outside the cell.

Provide an auxiliary platform release operated by a CO2 system with a device located inside the cell that will automatically drop the source to the bottom of the well if the temperature inside the cell exceeds 300°F.

Provide all necessary control devices and limit switches on the source elevator motor, which shall permit the incorporation of the motor with the owners security lock system given below:

Design of Interlock System for Special Laboratory

<u>Item</u>	<u>Operation</u>
A. Elevator, lower limit switch deactivated	Elevator Rising
(1) Visual Alarm - Control Room	On
Visual Alarm - Cell	On
(2) Audible Alarm - Cell	On
(3) Water Level	Normal
(4) High Level Monitor-Cell	<10 R/hr.
(5) Low Level Monitor - Control Room	<7.5 mr./hr.
(6) Gate Lock	Locked
B. Elevator, upper limit switch activated	Elevator Raised
(1) Visual Alarm - Control Room	On
Visual Alarm - Cell	On
(2) Audible Alarm - Cell	Off
(3) Water Level	Normal
(4) High Level Monitor - Cell	Off
(5) Low Level Monitor - Control Room	On
(6) Gate Lock	Locked
C. Elevator, upper limit switch deactivated	Elevator Falling
(1 & 2) Alarms	On
(3) Water Level	Normal
(4) High Level Monitor	On
(5) Low Level Monitor	On
(6) Gate Lock	Locked
D. Elevator, lower limit switch activated	Elevator Down
(1 & 2) Alarms	Off
(3) Water Level	Normal
(4) High Level Monitor	<10 R/hr.
(5) Low Level Monitor	<7.5 m.v./hr.
(6) Gate Lock	Open

Hoist Mechanism - Safety Provisions (Continued)Design of Interlock System for Special Laboratory (Continued)

<u>Item</u>	<u>Operation</u>
E. Elevator, 300°F. Thermal relay deactivated	Working Normally
Elevator Sprinklers relay activated	Off
Elevator Sprinklers	Drops (Gravity)
	On

Electrical system is to be designed to fulfill these operations.

Shielding

Provide in the design and construction of the tunnel for the hoist drive shaft, and any other openings through the barrier in connection with the elevator, sufficient shielding to reduce the radiation to a level acceptable to the owner.

Guarantee

Manufacturer guarantees the equipment to operate satisfactorily and continuously in accordance with the operating conditions contained herein. If the equipment fails to meet the guarantee, the Manufacturer agrees, at his own expense fob shipping point, to furnish new equipment or to modify the equipment furnished so that the guaranteed operating conditions are met.

Manufacturer guarantees the equipment to be free from defects in design, workmanship and/or material and agrees to repair or replace at his own expense, fob shipping point, any part of the equipment proving defective within one year of the date of acceptance, provided the defect existed at the time of acceptance or was caused by poor design, workmanship and/or material.

Drawings

Manufacturer's detailed drawings in triplicate to be sent for approval to Mr. F. X. Schoen, Carbide and Carbon Chemicals Company, P. O. Box 8361, South Charleston, West Virginia. Approval of these drawings to be obtained before fabrication is started.

Eight sets of certified prints also to be sent to Mr. F. X. Schoen.