COMPANY

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DIVISION

February 28, 1966

Mr. Robert E. Brinkman
Isotopes Branch
Division of Licensing and Regulation
United States Atomic Energy Commission
Washington, D. C. 20545

Dear Mr. Brinkman:

Subject: Application for Amendment to License No. 34-54-5

Application is herewith being made to amend License No. 34-54-5 to permit possession of 400 curies of tritium in the combined manufacturing facilities of the Lamp Division, General Electric Company.

This increased possession limit is necessary to facilitate the production of mixed gases used in the manufacture of glow lamps containing up to 10 microcuries of H-3 gas. These glow lamps will be used as electronic circuit elements for military applications.

Tritium gas will be received by the Cleveland Wire Plant in 50 ml. Hoke Cylinders, each cylinder containing 48 curies H-3. These cylinders are under negative pressure and will be stored, as received, in a wall-well provided for radioactive gas storage. Storage and mixing of gases will be done in the room described in our application for License No. 34-54-5, dated July 12, 1960.

Inasmuch as the Hoke Cylinders are under negative pressure, any leakage will be in the direction of bringing the Hoke Cylinder to atmospheric. Any tritium diffusing out after this will adequately be removed by the room exhaust system.

Actual mixing with Neon and/or Argon gases will take place on a manifold specifically designed for this purpose. The procedure for mixing includes steps designed to indicate the tightness of the system prior to the distribution of the H-3 from its Hoke Cylinder to the cylinders which will contain the diluted gas mixtures. The geometric configuration of the manifold system is shown in the attached stagramatic sketch.

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The room used for the mixing of these gases has a free space volume of about 1000 cubic feet, and the present ventilation system provides a nominal rate of one air change per minute. The operator of the equipment is stationed upwind of the process manifold, and, in the event of H-3 leakage, will be out of the path of the contaminated air. Further, the basic instructions for gas-filling with radioactive gases require the operator to immediately vacate the room in the event of any gas release. Under the "worst possible situation" type of release, the maximum tritium involved would be 48 curies which, if averaged over a period of 24-hour dilution, would give an air-borne concentration of 1.1x10⁻³ microcurie/milliliter. Thus, the 40-hour exposure, specified as permissible in Schedule B, Table I, 10CFR20, will not be exceeded.

Safety evaluation of this operation does not indicate potential hazard from either normal operation, or from an accidental release during gasfilling and mixing operation. Nevertheless, we are presently in the process of designing a local exhaust ventilation system to service the mixing manifold which will provide an additional means of quickly removing any such released gas.

Mixed gases in 100-200 liter cylinders will be transported to the Cleveland Lamp Plant in one of our own local gas delivery trucks. Cylinders will contain about 24 curies each of tritium, and will be stored and used in this plant in a ventilated cabinet, shown in the attached sketch. Approximately 100 curies of tritium will be in use at this plant at any one period.

The Lamp Division Radioisotope Committee has reviewed this entire operation and is convinced that a possession limit of 400 curies will not produce a potential exposure to any employee. We are prepared, however, to comply with any provisions the Commission requires in approving our request for this increased possession limit.

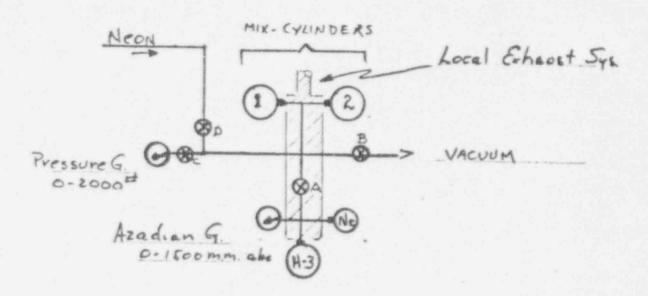
For the Radioisotope Committee

I. Matelsky Chairman

IM:ejp Attachments 2



Gas Mixing -- Cleveland Wire Plant. 2-28-66



System Check

H-3 Hoke Cylinder valve closed Mix cylinder valves open Valves C & D closed Small Neon source cylinder valve closed Valve A open

Open Valve B to vacuum - until Azadian gauge reads O mm and close Valve B Check Azadian gauge for about 10 minutes for slow leak in system

Hoke Cylinder Check

Close Valve A
Open Hoke Cylinder valve
Azadian gauge above about 250 mm (abs) indicates leak in Hoke Cylinder

Gas Mixing

Gas mixing is accomplished by means of Neon pressure into Hoke Cylinder, and flushing into evacuated gas-mixture cylinders. Manifold system purged by repeated pressurization and flushing of Hoke Cylinder. Final fill-pressure determined by large Neon source.



To Lamp Making Equipment Cylinder mixed gases in use -48C. 4-3/200L1 Stored - copped - Cylinders

Rodioactive Caution Placord on Door.

CLEVELAND LAMP PLANT High Doped H-3 Cylinders - eleste

