

UNITED STATES GOVERNMENT

Memorandum

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TO : Files

DATE: February 13, 1968

FROM : Frank C. Davis, Isotopes Branch ^{FD}
Division of Materials Licensing

SUBJECT: ANALYSIS OF NEUTRON PRODUCTS, INC., (b)(2)High CURIE COBALT 60 STORAGE,
PROCESSING AND IRRADIATION FACILITY (LICENSE NO. 19-12667-1)

INTRODUCTION

The NPI plant complex is located on Sugarloaf Road alongside a B & O Railroad spur in Dickerson, Maryland. That portion of the facility which houses the byproduct material consists basically of three individual areas of operation:

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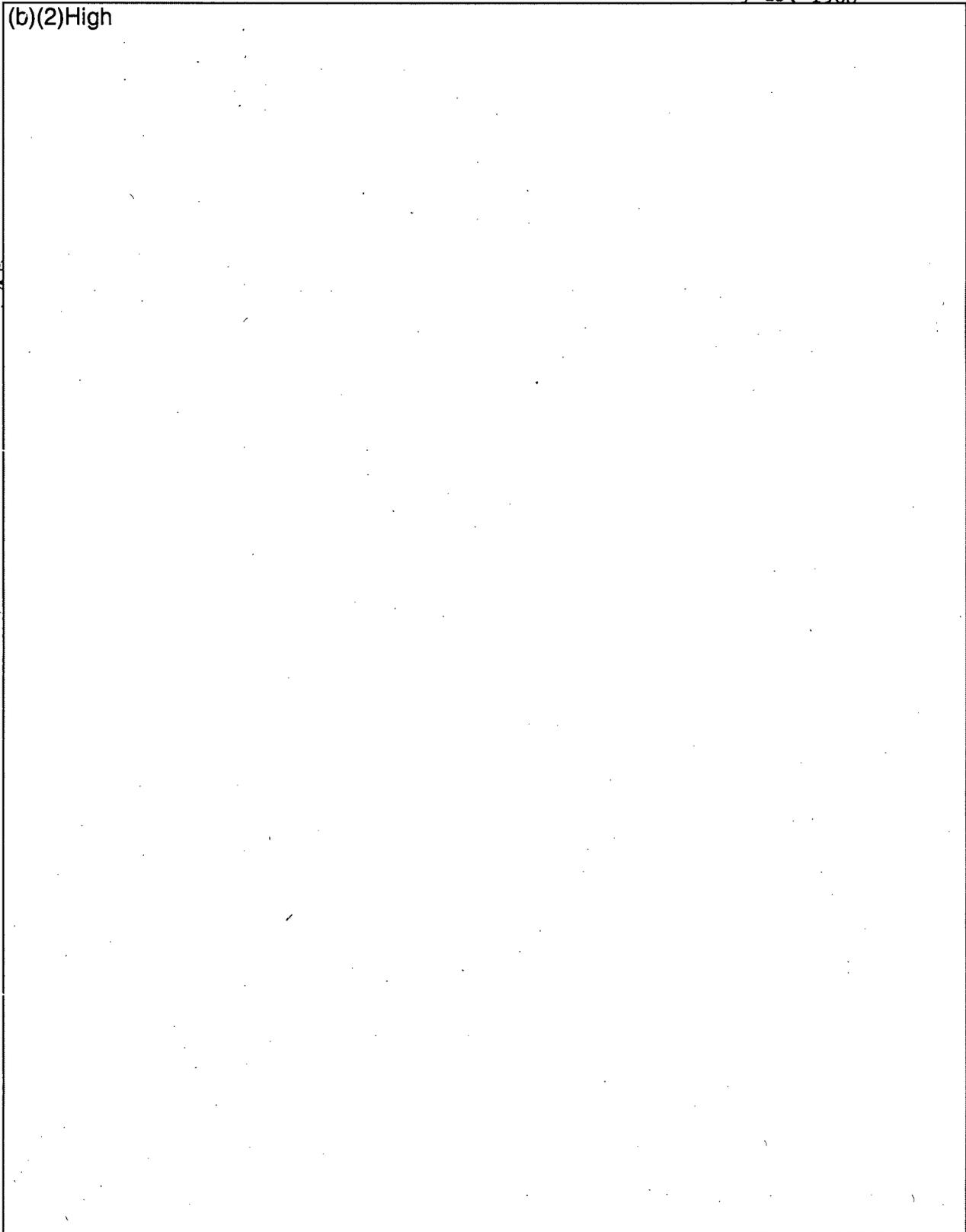
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The room above is shielded on all four sides by 8 inch concrete block walls which extend approximately 13ft. to a ceiling made of sheet rock. This room, 17ft. long by 15ft. wide, contains the auxiliary equipment necessary for the process irradiation. This enclosure is essentially air tight with respect to the pool area and to the other areas (office space, laboratory, etc.) of the building.

C. Irregular South Cell

The cell is approximately 3 1/2ft. wide by 14ft. long and ^{24 change} 16ft. high. Its walls are built of reinforced concrete ranging from 12 inches to 43 inches. The wall separating the two underneath cells is constructed of 19 inches of regular concrete and 24 inches of high density concrete equalling approximately 55 inches of regular concrete, while the wall separating this cell from the pool consists again of 37 inches of regular concrete. At present the term cell, as applied here, is a misnomer. It has no ceiling and is simply an open, dry, concrete pit. NPI has designed this area in this manner with the option of converting it into a second enclosed cell sometime in the future. Penetrating the wall separating the pool and cell is the last 4 inch diameter stainless steel pipe. This pipe is fitted with gate valves on each end to provide a water lock for passing the sources between the pool and cell.

SOURCES

There are presently two basic types of NPI cobalt 60 sources, hollow (i.e., spiral wire) and solid. All the sources are singly encapsulated in Type 304 stainless steel having an outside diameter of 0.271 ± 0.0015 inch, a nominal wall thickness of 0.01 inch, and overall lengths of either $5 \frac{3}{8}$, 10, or 12 inches. The capsules are sealed with a 1/8 inch stainless steel plug that is heliarc welded to the main capsule body.

Safety Features

I. Processing and Storage Pool

1. A Victoreen Model 808B Vamp radiation monitor, located at the south end of the pool approximately ten feet above the floor, will alarm in the event a capsule is raised too close to the surface of the pool. The monitor, built with non-jamming circuit features, has a three-decade range from 0.1 to 100mr/hr. The pre-set alarm point will be 5mr/hr.

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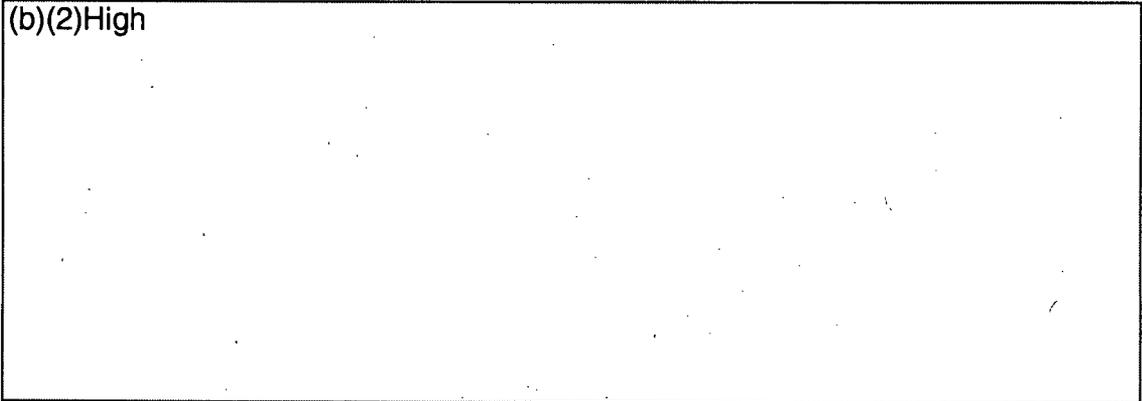
9. The pool is built in an area of almost nil earthquake activity and upon a layer of crushed stone as a further precaution to any conceivable land dislocation.
10. In the advent of a pool wall rupture, the pool water would be contained within the bedrock cavity, since seeping through the bedrock is not possible.
11. A Staplex high volume air sampler is available for collecting air samples should air contamination ever be suspected.

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II. Pilot Plant Process Irradiation Facility

A. Process Room

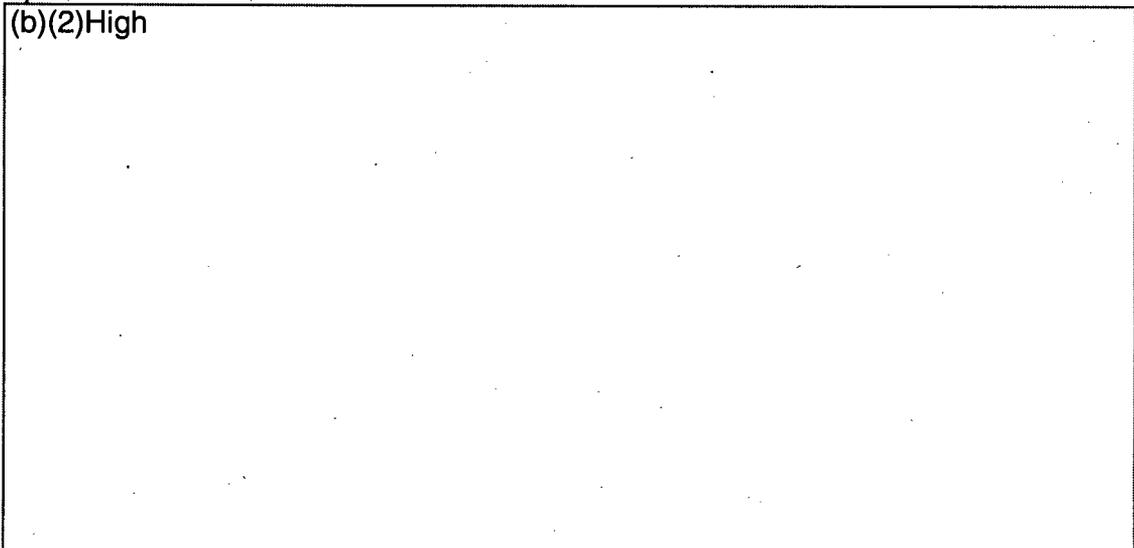
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3. A check on the operability of the "Irradiator On" warning sign is required prior to each use of the irradiator.
4. Use of a portable radiation survey meter to monitor the radiation levels as one enters the process room.
5. The process room and irradiation cell have a special ventilation system which changes the air in both areas once every three minutes. This dilution ventilation is designed to conform to standards of safety presently in use throughout the polymer industry.

B. Irradiator Cell

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