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X-RAY DEPARTMENT

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John N. Maddox
Technical Assistant to the Director
Division of Isotopes Development
U. S. Atomic Energy Commission
Washington 25, D. C.

Dear Mr. Maddox:

Mr. R. B. Gustafson of our Medical Product Planning group has forwarded to me your request for a brief history of our participation in the field of medical teletherapy equipment and sources. Since most of the preliminary work on this subject was handled by Dr. E. Dale Trout who retired last year, I must rely on what information is in our files to establish the sequence of events that lead to our present position in the field.

Late in 1949, the Medical Division of the Oak Ridge Institute of Nuclear Studies and the M. D. Anderson Hospital for Cancer Research entered into a joint program for the design, construction, and experimental testing of a large cobalt-60 teletherapy unit. A portion of the cost of the project was supplied by the Damon Runyan Fund as a grant to the M. D. Anderson Hospital for Cancer Research. In 1951, these institutions entered into a contract with the X-Ray Department of the General Electric Company calling for construction of such a unit.

The unit was constructed to the basic design of Dr. L.G. Grimmett who, prior to his sudden death in May 1951, was head of the Department of Physics of the M. D. Anderson Hospital for Cancer Research. The completed unit, less a source, was shipped to Oak Ridge in August 1951. A cobalt-60 source 2 cm x 2 cm x 1 cm was ordered by ORINS from the Eldorado Mining and Refining Company, Ottawa, Ontario. The source, to have a gross curie content of approximately 1200 curies, was ordered with delivery of the source to Oak Ridge to coincide with delivery of the teletherapy unit. The Eldorado Mining and Refining Company was the forerunner of the present Atomic Energy of Canada, Ltd., and operated the reactor at Chalk River. Delivery of the cobalt-60 source was delayed so that preliminary investigation work with the equipment

was performed at Oak Ridge employing a much lower dose rate USAEC source of the same physical dimensions as the forthcoming Canadian source. The final source was ordered from Canada due to the higher neutron flux densities available in the Chalk River reactor with the resulting higher specific activity as compared with that available from the U. S. reactors.

The basic design of the unit incorporated Hevimet as the main protective material and, since the Korean situation developed during this time, the cost of tungsten increased considerably. As a result, it would not have been commercially feasible to market a unit using primarily tungsten alloy as the protective material. Changing to a lead unit would require a major redesign of both the unit and supporting structure. At this time the only source of high specific activity was the Chalk River reactor so that if we did go ahead with design and manufacture of a cobalt-60 unit, the sources would undoubtedly have to come from Canada. The Canadian source was also attractive since the reactor could not be used for munitions production and hence offered a reasonably secure source of supply for cobalt-60 sources regardless of world tensions.

On the basis of a market study made by the X-Ray Department, the X-Ray Department decided to market AECL units and sources. The study convinced the X-Ray Department that, in view of high manufacturing costs and the expected relatively small market for teletherapy equipment, it would not be a prudent business decision to design and manufacture our own. The Department has handled AECL units and sources since 1953 on a non-exclusive basis.

I trust the preceding gives you the answers to your questions. Let me know if you have any further questions.

Sincerely yours,

John P. Kelley
Radiation Physics Laboratory