Nuclear Energy Advisory Committee

October 1, 2008

Dr. Samuel Bodman
Secretary of Energy
U.S. Department of Energy
Washington, D.C. 20855

Dear Secretary Bodman:

The Nuclear Energy Advisory Committee (NEAC) recommends that the Department of Energy (DOE) provide support for the constructing a molybdenum-99 (^{99}Mo) processing facility that will ensure a reliable domestic supply of the medical isotope technetium-99m (^{99m}Tc).

^{99m}Tc, the daughter (decay product) of ^{99}Mo, is the most common medical radioisotope in the world, used in as many as 70 to 85 percent of all nuclear medicine procedures. ^{99m}Tc is the active ingredient in more than 30 different radiopharmaceuticals used for imaging and performing functional studies of the brain, myocardium, thyroid, lungs, liver, gallbladder, kidneys, skeleton, blood and tumors. It is estimated that in the United States ^{99m}Tc is used 35,000 times each day, and yet there is no domestic production of ^{99}Mo.

The events of the past year have demonstrated how fragile the supply chain is for this important medical isotope. The extended shutdown of the NRU reactor in Canada last December caused the Canadian Parliament to override the Canadian Nuclear Safety Commission in ordering the restart of the reactor. The NRU reactor produces 60 percent of the world's supply of ^{99}Mo using highly enriched uranium (HEU) targets. The NRU is not expected to operate beyond 2016 at the latest. To add to the problem the Joint Research Center - Petten reactor in the Netherlands is shut down due to a malfunction. JRC - Petten is the major supplier of ^{99}Mo for Europe and also supplies about half of the U.S. need. With the Petten reactor expected to be out of service for at least four months, Europe is expecting shortages of 30 percent, which translates into the delay of thousands of medical procedures.

Domestic production of ^{99}Mo should use low-enriched uranium (LEU) targets and the reactor should use LEU fuel, or be in the process of converting to LEU fuel. The use of LEU fuel and targets for medical isotope production is in the US national security interest and supports both the Energy Policy Act of 2005 and National Nuclear Security Administration's Global Threat Reduction Initiative.

There are several domestic research and test reactors that are capable of producing ^{99}Mo, and at least some that currently use highly enriched uranium (HEU) fuel are being converted to LEU fuel with DOE's assistance. The feasibility of both producing ^{99}Mo using LEU targets and extracting ^{99m}Tc from these targets has been demonstrated. Processing the targets requires a dedicated processing facility and Federal support

regarding the disposition of the generated fission product waste. These are the major constraints. A capital investment is required to design, build, and license a radioisotope production facility.

We strongly recommend that the DOE seek to identify the option that offers the shortest time-line and most cost-effective method of ensuring the U.S. medical community has access to this vitally important isotope for diagnosing and treating their patients. We believe that DOE and the Congress should not delay for another budget cycle, but should provide as soon as possible the necessary funds to begin design and licensing of the ^{99}Mo processing facility to ensure a reliable supply of this critical nuclear medicine isotope.

Respectfully,

William Martin, Chairman
Nuclear Energy Advisory Committee

cc. Mr. Dennis R. Spurgeon
Assistant Secretary for Nuclear Energy

Dr. Raymond L. Orbach
Under Secretary for Science