

IV Nuclear suppliers group

Two developments in the mid-1970s led to a questioning of the non-proliferation régime. First, the interest in nuclear energy, particularly in advanced nuclear technologies, increased greatly owing to the "energy crisis" of 1973-74. The quest for greater energy independence by many industrialized countries and several developing ones, especially those with nuclear power programs that were without large indigenous uranium reserves, led to much more interest in reprocessing spent fuel to obtain plutonium for recycling in thermal reactors or for eventual use in fast breeder reactors. "Reprocessing" is basically a series of chemical processes in which spent fuel is first dissolved in an acid. Subsequently, substances of value that were produced in the reactor such as plutonium, or uranium that was not consumed while it was in the reactor, are extracted and separated for further use. Plutonium is itself a nuclear fuel that can be used in both traditional reactors as well as in fast breeder reactors. A fast breeder reactor is one that has a plutonium core surrounded by a uranium shell. In the course of operations, the plutonium is consumed but new plutonium is produced from the uranium in the shell. Thus the plutonium "breeds" new plutonium which in turn can be used as fuel.

It was generally agreed that the separation of plutonium from spent fuel and its subsequent use in recycling was a natural feature of an efficient light-water reactor fuel cycle. Moreover, the reprocessing of spent fuel was considered as an element of policy in the nuclear waste disposal programs of some countries and as a necessary step in the expected development of fast breeder reactors. In fact, the United States had declassified its reprocessing technology in recognition of this general understanding. Some of the other countries which had developed an indigenous reprocessing technology concluded that the export of that technology under IAEA safeguards was acceptable and, accordingly, entered into contracts to do so. However, because reprocessing released large quantities of plutonium, many people felt uneasy about the procedure. It was by no means clear in the mid-1970s whether or how reprocessing could be adequately safeguarded.