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IAEA Study - Uranium Supply to 2060

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IAEA is in the process of publishing a new study entitled: Uranium Supply To 2060 (U2060). This report is a sequel to "Analysis of Uranium Supply to 2050", published in 2001. Many changes to demand, supply and prices have occurred since that publication, including: complete suspension of operations within the Japanese fleet of nuclear reactors; conclusion of the Russian –US HEU agreement under which some 20,000 Russian nuclear warheads were converted into nuclear fuel; and significant uranium price volatility, i.e. <US9.00/$lbU3O8in2001, > US$130/lb U3O8 in 2007 and <US$40/lb U3O8 in 2013. U2060 incorporates these changes.
U2060 sets forth three demand cases that project reactor uranium requirements from 2010 to 2060. The middle or "reference"demand case forecasts moderate worldwide economic growth, accompanied by a modest growth in nuclear power that averages 1.8% per year. The high demand case envisions strong economic growth with accelerated growth in nuclear power averaging 2.4% per year, while the low demand case assumes that nuclear power will grow only slightly during the forecast period. It seems unlikely, at this time, that nuclear power would be phased out to any substantial degree within the foreseeable future.

U2060 reviews the supply sources that are expected to be available to meet reactor uranium demand through to 2060. The structure of the report accommodates the fact that globalization of commodities is now a reality and that most uranium supply sources are now constrained by market economics. Non-market based supply, as was the case for example in the former Soviet Union, is expected to play a decreasing role in the fulfillment of nuclear fuel demand. Therefore, the main focus of this report is adequacy of market based production to meet that demand.

Uranium supply is divided into two broad categories: secondary and primary supply. Secondary supply sources include high enriched uranium from nuclear weapons, natural and low enriched uranium inventories, mixed oxide fuels and reprocessed uranium and re-enrichment of depleted uranium stockpiles (tails). Primary supply includes all newly mined and processed uranium, including small amounts of non-market-based supply such as may derive from China or India. Consideration is given to conventional resources as well as to high cost unconventional resources associated with phosphorite, black shale, lignite, coal deposits and sea water. The requirement for primary supply is taken to be total demand, including increased inventories, less secondary supply.

The remainder of this report is largely devoted to assessing the adequacy of uranium resources to satisfy future nuclear fuel requirements and considers: confidence of the various resource categories, estimated production costs, and timing of new production capacity.

Primary author: Mr POOL, Thomas (International Nuclear, Inc.)

Co-authors: Mr UNDERHILL, Douglas (Independent); Mr BLAISE, Jean Rene (Independent); Ms WARTHAN, Kimberlie (Independent); Mr HARIKRISHNAN, Tulsidas (IAEA)

Presenter: Mr POOL, Thomas (International Nuclear, Inc.)

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