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SI WS 76-048

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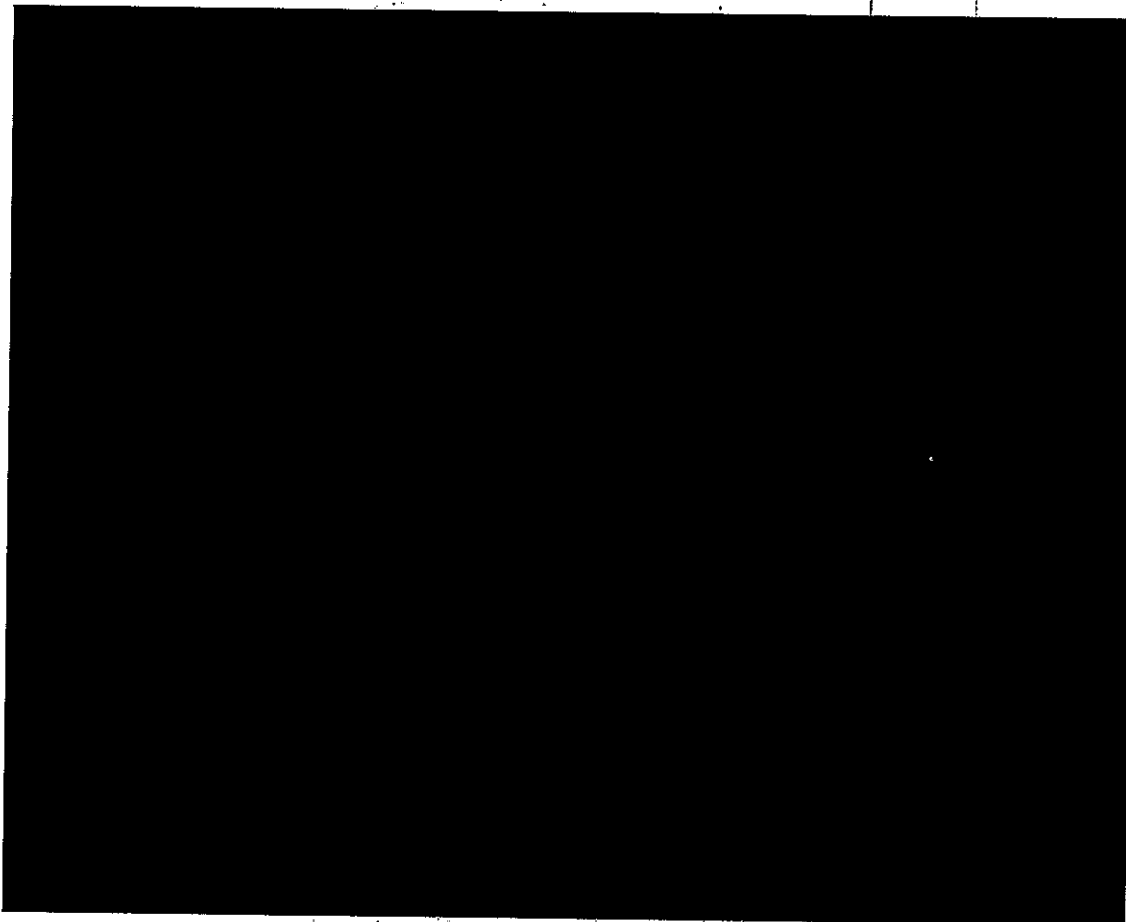
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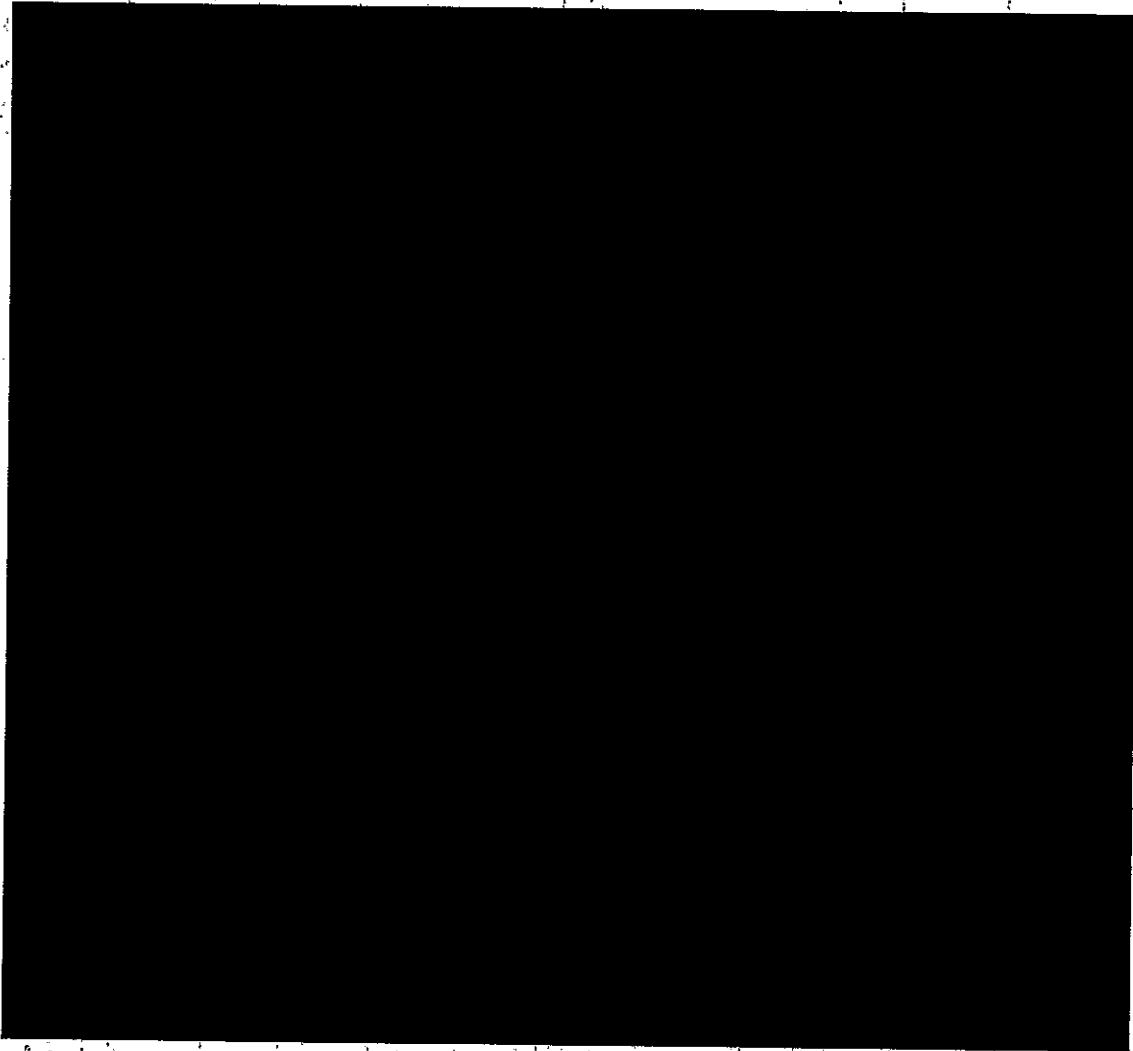


South African Pilot Plant May Enrich
Uranium to More Than 20% U-235. 1



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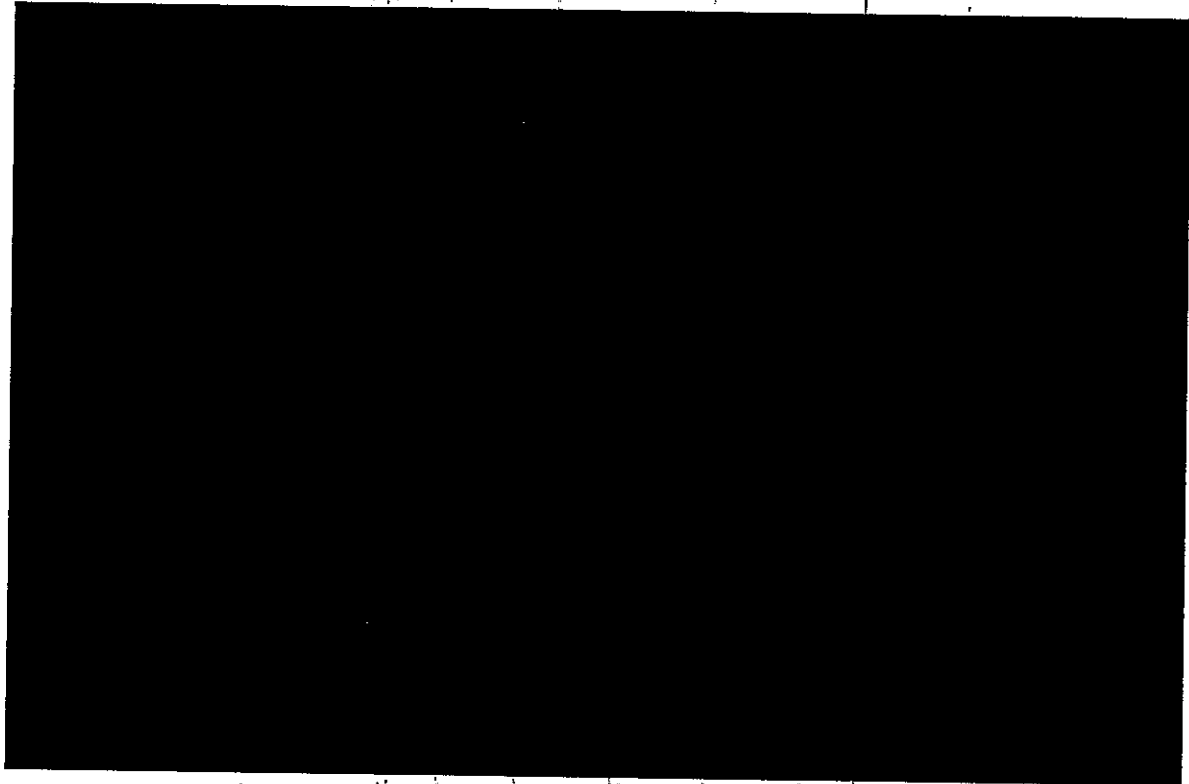


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NUCLEAR ENERGY



South African Pilot Plant May Enrich Uranium to More Than 20% U-235; Published photographs of process equipment in the South African enrichment plant suggest that the plant is made up of several hundred stages arranged in a simple series. The simple series of stages indicated by the photographs could produce high levels of enrichment (more than 20% U-235), although no significant requirements for such high-enrichment levels are foreseen from South African descriptions of its nuclear program.

The more complex arrangement of stages which had been expected for this plant in South Africa probably would have demonstrated the greatest efficiency with respect to energy consumption. It would, however, have limited the plant to production of reactor-grade enrichment (less than 4% U-235). These expectations were based

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on the belief that the South African enrichment process involves a small cut; i.e., that the amount of uranium that is enriched at each stage is only a small fraction of the amount of uranium that is fed through the stage. This usually means that at each stage the enriched stream is also small compared with the depleted stream, which complicates the connections between stages. The published photographs indicate, however, that the enriched and depleted streams issuing from each stage are about equal, permitting a very simple flow pattern through the plant. This may have been accomplished, at the cost of some efficiency, by splitting the feed stream at each stage into a small enriched portion, a small depleted portion, and a third portion which is recycled.