

# Beware of SWU Units

ISIS Course

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- We discussed measuring enrichment effort in units of kilograms of uranium separative work units, or kg U SWU, or SWU for short. There is another unit, called kilograms of uranium hexafluoride SWU, namely kg UF<sub>6</sub> SWU.
- The difference has to do how the unit is constructed.
- When you calculate the number of separative work units, one has to consider the flow rates of feed, product and tails. If one uses a flow rate of UF<sub>6</sub>, then one gets SWU in terms of the mass of UF<sub>6</sub>, or kg UF<sub>6</sub> SWU
- Why do we care? Iran often gives flow rates in kilograms of UF<sub>6</sub>. In this case, the separative work unit is kilograms of UF<sub>6</sub> SWU rather than kg U SWU
- The difference is that the value in kg U SWU is about two thirds of the value in kg UF<sub>6</sub> SWU.

# Conversion of Units

- PressTV reported that Iran would need “190,000 SWU” to provide the fuel annually needed for the country’s power and research nuclear, essentially the enriched uranium needed each year to fuel the Bushehr nuclear power reactor.
- This statement should be interpreted as using units of kg UF<sub>6</sub> SWU
- For more on this see: <http://isis-online.org/isis-reports/detail/technical-note-making-sense-out-of-the-ir-8-centrifuge/8>
- Thus, 190,000 kg UF<sub>6</sub> SWU would correspond to about 130,000 kg U SWU.
- An IR-1 centrifuge produces on average, when in production cascades, about 0.9 kg U SWU/year. By matching SWU units, achieving 130,000 kg U SWU/year would require  $130,000/0.9 = 144,444$  IR-1 centrifuges, but not  $190,000/0.9 = 211,111$  centrifuges.
- Many have made this mistake.