

Centrifuges key to Iran nuclear programme

Iran has vowed to complete building a cascade of 3,000 centrifuges and to begin "industrial scale" enrichment of uranium by the end of the year.

But the problems that have beset the work of two 164-centrifuge pilot cascades already installed may suggest that Iran's plan is behind target

URANIUM ENRICHMENT

Gas centrifuge: Used to increase proportion of U-235 isotope in UF₆ gas

Uranium hexafluoride gas (UF₆) feed

Waste

Enriched UF₆ gas

Magnetic suspension bearing

Rotor spins at high speed

Top scoop

Centrifugal force:

Heavier UF₆ molecules move closer to wall – lighter U-235 molecules rise and are drawn off

Bottom scoop

Electric motor

Casing

Cascade: Proportion of U-235 isotope in UF₆ gas gradually increased through succession of centrifuges spinning in unison

PROBLEMS ENCOUNTERED

Centrifuge assembly:

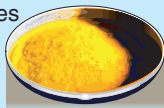
Balance critical during high speed rotation

Failure to wear cloth gloves leaves traces of sweat on rotor, which may cause it to vibrate and explode



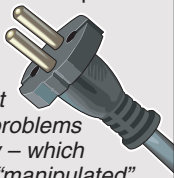
Feedstock: UF₆ with high levels of contaminants can damage centrifuges

UF₆ derived from uranium oxide – yellow cake



Faulty equipment: Centrifuges need to spin smoothly without overheating for sustained periods

Iranian scientists say that explosion of 50 centrifuges last April was due to problems with power supply – which might have been "manipulated"



Sabotage: U.S. intelligence sources suggest that Iranian scientist **Ardashire Hosseinpour** was assassinated by Israel's intelligence service, **Mossad**

With 3,000 centrifuges working non-stop, Iran could produce enough highly enriched uranium for one bomb within a year

Sources: IAEA, ISIS, Urenco, Stratfor

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