

Nuclear Regulatory Commission

Pt. 110, App. B

APPENDIX A TO PART 110—ILLUSTRATIVE LIST OF NUCLEAR REACTOR EQUIPMENT UNDER NRC EXPORT LICENSING AUTHORITY

NOTE—A nuclear reactor basically includes the items within or attached directly to the reactor vessel, the equipment which controls the level of power in the core, and the components which normally contain or come in direct contact with or control the primary coolant of the reactor core.

(1) Reactor pressure vessels, *i.e.*, metal vessels, as complete units or major shop-fabricated parts, especially designed or prepared to contain the core of a nuclear reactor and capable of withstanding the operating pressure of the primary coolant.

(2) On-line (e.g., CANDU) reactor fuel charging and discharging machines, *i.e.*, manipulative equipment especially designed for inserting or removing fuel in an operating nuclear reactor.

(3) Complete reactor control rod system, *i.e.*, rods especially designed or prepared for the control of the reaction rate in a nuclear reactor, including the neutron absorbing part and the support or suspension structures therefor;

(4) Reactor primary coolant pumps, *i.e.*, pumps especially designed or prepared for circulating the primary coolant in a nuclear reactor.

(5) Reactor pressure tubes, *i.e.*, tubes especially designed or prepared to contain fuel elements and the primary coolant in a nuclear reactor at an operating pressure in excess of 50 atmospheres.

(6) Zirconium tubes, *i.e.*, zirconium metal and alloys in the form of tubes or assemblies of tubes especially designed or prepared for use in a nuclear reactor.

(7) Reactor internals, e.g., core support structures, control and rod guide tubes, thermal shields, baffles, core grid plates and diffuser plates especially designed or prepared for use in a nuclear reactor.

(8) Reactor control rod drive mechanisms, including detection and measuring equipment to determine flux levels.

(9) Any other components especially designed or prepared for use in a nuclear reactor or in any of the components described in this appendix.

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APPENDIX B TO PART 110—ILLUSTRATIVE LIST OF GAS CENTRIFUGE ENRICHMENT PLANT COMPONENTS UNDER NRC'S EXPORT LICENSING AUTHORITY

1. *Assemblies and components especially designed or prepared for use in gas centrifuges.*

NOTE: The gas centrifuge normally consists of a thin-walled cylinder(s) of between 75mm (3 ins.) and 400 mm (16 ins.) diameter contained in a vacuum environment and spun at high peripheral speed (of the order of 300 m/ per second and more) with the central axis vertical. In order to achieve high speed, the materials of construction for the rotating rotor assembly, and hence its individual components, have to be manufactured to very close tolerances in order to minimize the unbalance. In contrast to other centrifuges, the gas centrifuge for uranium enrichment is characterized by having within the rotor chamber a rotating disc-shaped baffle(s) and a stationary tube arrangement for feeding and extracting UF₆ gas and featuring at least 3 separate channels of which 2 are connected to scoops extending from the rotor axis towards the periphery of the rotor chamber. Also contained within the vacuum environment are a number of critical items which do not rotate and which, although they are especially designed, are not difficult to fabricate nor are they fabricated out of unique materials. A centrifuge facility, however, requires a large number of these components so that quantities can provide an important indication of end use.

1.1 *Rotating Components.*

(a) Complete Rotor Assemblies: Thin-walled cylinders, or a number of interconnected thin-walled cylinders, manufactured from one of the high strength-to-density ratio materials described in the Footnote to this Section.

If interconnected, the cylinders are joined together by flexible bellows or rings as described in §1.1(c). The rotor is fitted with an internal baffle(s) and end caps, as described in §1.1 (d) and (e), if in final form. However, the complete assembly may be delivered only partly assembled.

(b) Rotor Tubes: Especially designed or prepared thin-walled cylinders with thickness of 12mm (.50 in.) or less, a diameter of between 75mm (3 ins.) and 400mm (16 ins.), and manufactured from one of the high strength-to-density ratio materials described in the Footnote to this Section.

(c) Rings or Bellows: Components especially designed or prepared to give localized support to the rotor tube or to join together a number of rotor tubes. The bellows in a short cylinder of wall thickness 3mm (.125 in.) or less, a diameter of between 75mm (3 ins.) and 400mm (16 ins.), having a convolute,