containing plutonium has also to be available. Plutonium is however more difficult to process into final weapons-grade chemical form than uranium.

As with the U-235 route, the possibility of smuggled plutonium [3] is included in the undeclared facility category.

4.2.3 Uranium-233 Route

Tables 1.3 and 2.3 represent the various facilities relevant for the U-233 acquisition route for declared and undeclared facilities respectively. The key items for this (thorium fuel cycle) route are production by reactor irradiation of naturally occurring Th-232, followed by the separation of U-233 from reactor spent fuel in a reprocessing facility. This route is much less likely than the previous two, because of the more complex and currently unused thorium fuel cycle, and also because U-233 and associated isotopes are more radioactive than U-235, thus complicating weapon design. Nevertheless, the US is reported to have separated 1.4 tons of U-233, and to have tested a nuclear weapon using this isotope. [6] While this quantity is significant in terms of potential numbers of weapons producible, it is extremely small compared to the quantities of Pu-239 and U-235 currently available in the NWS.

Similar to footnote [5], this isotope may also be produced from accelerator sources using Th-232. This type of facility is discounted at present, as the technology has not yet been developed.

4.3 Diversion Risk Assessment

To provide a qualitative assessment of the relative risk of diversion from the various declared facilities, undeclared facilities and other acquisition sources, the associated risk- and verification-relevant parameters are defined in the first vertical column of the analysis tables. The intent is to document the two main contributors to diversion risk for each facility type: diversion frequency and diversion consequences.

The diversion frequency is assumed to comprise a combination of parameters that directly affect the likelihood of diversion (Section 4.3.1), and the effectiveness of diversion detection (i.e., verification and/or safeguards) methods (Section 4.3.5). By factoring in diversion effectiveness it is assumed that detection would, in effect, contribute to frequency reduction and hence risk reduction. This would be caused by the measures subsequently taken and/or the pressures and inconveniences caused by the international community, as a result of diversion discovery.

The diversion consequence parameter is represented by assessing the importance of a particular facility anomaly (Section 4.3.2) to the overall fissile material acquisition process.

The sections below define the diversion-risk-related parameters in more detail, and discuss the type of information documented for these parameters in the tables.

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[6] IAEA Safeguards and Detection of Undeclared Nuclear Activities, R.J. S. Harry, Nuclear Materials Management, 34th Annual Meeting, Scottsdale, Arizona, July 1993, p.109.