

have been provided in a second listing in Appendix A. Copies of the most relevant items have been obtained, together with other references on more technical aspects on fissile material and related production facilities. The articles are available from the authors on request.

The concept of halting the production of nuclear weapons fissile material, primarily plutonium-239 and highly enriched uranium, dates back to 1946, when the US presented the Baruch Plan to the UN. This plan proposed a concept for complete managerial control of the production of fissile materials. The bibliography of Appendix A and B does not include a complete list of proposed resolutions presented at the UN, from the US or other member states on the subject of cut-off. Some of the more recent references in Appendix A do, however, provide specific details of the key cut-off proposals. Appendix C also provides a brief historical review of cut-off and related proposals for reference.

4. Analysis Method

This section discusses the way in which the data specified in the Section 2, items (c) and (d) are documented. A spreadsheet-type representation is used to present this information in Tables 1.1 to 1.3 and Tables 2.1 to 2.3. These six tables summarize a complex picture of various potential fissile material diversion paths, diversion signatures, verification techniques appropriate for declared facilities, undeclared facilities and undeclared acquisition routes. This data is then assessed to provide relative diversion-risk rankings, according to different types of states. Treaty implications across the whole spectrum of relevant facilities and fissile isotopes can then be seen in overview.

The framework is also intended to provide a systematic logical structure from which a more detailed analysis of any of the items could be made, without changing the method of representation. Tables 1.1 to 1.3 deal with declared facilities and Tables 2.1 to 2.3 with undeclared facilities. The fissile materials relevant to a production cut-off agreement determine three isotope-specific diversion routes: U-235, Pu-239 and U-233 (see Section 4.1.1). Each of these three isotope routes are then separately represented for both declared and undeclared facilities. Other fissile isotope routes to weaponization are, in principle, possible (see Section 4.1.1). These latter routes are not considered credible in the foreseeable future, for either developed or undeveloped states, and so have not been included in the analysis.

The tables list across the top the potential facilities or material acquisition methods. This listing is provided as systematically as possible to ensure completeness and the rationale is discussed further in Section 4.2. Down the left side of the tables are variables which provide information relevant to the assessment of relative risk of material diversion for each potential facility type. Sections 4.3.1 to 4.3.6 define and discuss each of these risk-relevant variables. As diversion risks are also expected to be strongly dependent on individual states, the way in which these are included in the tables is discussed in Section 4.3.1.

4.1 Fissile Material Diversion Routes

The following sections discuss the rationale for the choice of the fissile isotope materials and the associated sources of potential diversion paths, which are represented across the top of the six analysis tables.