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# A *List of Bilateral Civilian Interstate Nuclear Cooperation Agreements*

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For roughly forty years I have been collecting information on bilateral civilian interstate nuclear cooperation agreements and compiling a list of these. An earlier version, from material collected up to 2009, was made available in 2018. I have now finished a much expanded, reformatted and corrected version, the last one I intend to produce. It is now available on the PRISM system at the University of Calgary for use and downloading, without charge, but subject to conditions of attribution and non-commercial use. There are two ways of accessing it, for viewing or downloading. First, through the DOI (https://dx.doi.org/10.11575/PRISM/48246) or the URI (https://hdl.handle.net/1880/120637). Second, by going to the University of Calgary's PRISM Institutional Repository (https://prism.ucalgary.cas/home), then entering the title ("A List of Bilateral Civilian Interstate Nuclear Cooperation Agreements") or searching for that title under my name, and then clicking on the title to view or download. It may also be accessed through Google using the title.

Whereas the 2009 list consisted of 2269 entries (termed "sequences") covering 111 parties (including the European Union, its predecessors and EURATOM, and the Belgo-Luxembourg Economic Union), this final version covers 4844 sequences and 146 parties,



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from Afghanistan to Zimbabwe. It brings in a great deal of new material and information, and while it draws extensively on the 2009 version, it also reorders, corrects and revises that information, based on applicable new information. Some of the old entries have been rewritten, some fragmented, some consolidated, and some have been removed and their sequence numbers reassigned. For these reasons, aside from any of its various faults, the 2009 list should no longer be used. Please note that the 2009 version has been removed from PRISM.

The focus of the list is on civilian nuclear cooperation, covering the period from the 1940s until roughly the 2010-2020s. The endpoint is ragged, depending, e.g., on when available sources stop and/or when my gathering efforts stop. Particularly in the earlier years, differentiating between civilian use and military use may be difficult, so I have included several agreements that might either overlap between the two or are of some historical interest, such as the 1943 Tube Alloys agreement and the 1944 Hyde Park agreement between the US and the UK. I have tried to avoid including agreements that focus on industrial, agricultural, medical or nuclear ship uses, or purely legal or financial agreements in the main sequences, though some information in these areas may be included.

The 2024 list has four main sections. Section 1 contains explanatory and supporting material. It consists of a description and an explanation of the entries, a discussion of and a list of the sources used and their abbreviations in the entries, the codebook used for the creation of the associated dataset (Section 4), and party codes for that dataset.

Each sequence entry consists of the following information: parties (generally states), state agencies which are involved in the agreement, a title or description, dates of signing, coming into force or date of reporting or announcement (including revisions, amendments and extensions), the last date (if known) of the sequence, and the sources used. The explanation for these in Section 1 notes the nature and problems associated with these elements. In many sequences, there will also be a Note with information supplementing the entry (including, in many sequences, further agreements which I have treated as possibly or actually subordinated to the initial agreement). If the sequence seems to be connected to or has links with other sequences, this is also noted, though not all such linkages might be included.

Section 2 consists of the various individual sequences, in numerical order; the dataset in Section 4 corresponds with this list. Section 3 will be of interest to researchers focussed on specific states or dyads. It consists of country (or party) lists, organized by dyads and, within that, by chronological order. In this Section, each party included in the list is covered, along with its various partners. For example, the Canada list will include all of Canada's agreements in the list, by partner (in alphabetical order and, within that, in chronological order). The US-Canada list will cover the same information. Individual dyads may also include, at the end, a General Note containing some additional information, such as other agreements that may be of interest. Section 4 is an Excel dataset.

Some of the lengthier country lists are as follows: United States (approximately 1160 sequences); Russia/USSR (approximately 900 sequences); France (approximately 700 sequences); People's Republic of China (approximately 415 sequences); Japan (approximately 380 sequences); Argentina (approximately 350 sequences); Federal Republic of Germany (approximately 300 sequences); India (approximately 275 sequences); and Republic of Korea (approximately 255 sequences). Some of the lengthier dyad lists are as follows: US-Japan (approximately 100 sequences); Russia/USSR-US (approximately 70 sequences); China-Russia/USSR (approximately 50 sequences); India-Russia (approximately 40 sequences); France-US (approximately 40 sequences); UK-US (approximately 35 sequences); France-India (approximately 35 sequences); China-US (approximately 30 sequences); Federal Republic of Germany-US (approximately 30 sequences); and Iran-Russia/USSR (approximately 30 sequences).

Milton Friedman apparently once remarked that users of datasets should be aware of their characteristics and how they were constructed. I have tried to take this to heart. Users of the 2024 list should be aware of its various limitations, shortcomings and problems, and should bear these in mind. I have tried to note several of these in the explanatory material of Section 1, including in the codebook. For these reasons, I must emphasize that the list is a place to start, not a place to finish and that all users, including those only using the dataset, should read the sequence entries carefully and may wish to modify them and/or the dataset depending on their own purposes.

Above all, the list is neither a full universe of cases nor is it a carefully constructed sample. It is based simply on the information available to me at the time. Strictly

speaking, therefore, while the list may suggest some conclusions about patterns of nuclear cooperation, any specific conclusions derived from the list (without further research) would reflect only the list entries themselves, not the wider universe of cases. Additional information may add new agreements, change the entries for existing sequences, change how they are coded, etc. The differences between the 2009 version and this version are testimony to this. Also, from the list of sources in Section 1, it will be apparent that I have not consulted the full variety of sources which would (at least in theory) be available. In part, this is due to language difficulties, in part to access difficulties, in part to resource (including time) limitations, and in part simply to my failings as a compiler. As a result, some regions or states, for example, will likely – or undoubtedly – be underrepresented. Here, also, users should consider supplementing the list to reflect their particular interests. As well, some sources or some information in sources may no longer be readily accessible, if at all. Different sources may also give varying information, whether in general or regarding the same sequence. Some of the difficulties attending sources are noted in the relevant parts of Section 1, including the codebook.

Particularly regarding the codebook and dataset, users should also recognize the difficulties in handling dates (where information may be incomplete or may vary from one source to another) and in handling the proposed typology for the dataset. Regarding the latter, I have tried to assign types first by a general category and, within these, by the more specific type of agreement involved. While the numerous subtypes in the dataset may seem to give the lie, I have in fact tried to avoid too much complication. What the numerous subtypes indicate is, in fact, the difficulties I found in constructing a useful, but simplified, typology. Many nuclear agreements are of a broad nature and thus may cross numerous specific or even general categories. In some sequences, as well, I have no information regarding the nature of the agreement. For these, while the list entry may alert a user that something may be going on, further research may be required. In general, here also users may wish to inquire further and/or to modify the coding to reflect their specific interests.

Finally, it must be recognized that the mere existence of an agreement does not necessarily mean that anything of substance actually happened and, conversely, that the absence of a formal agreement does not mean that nothing of substance was happening.

Anyone seeking additional information about the 2024 list may contact me at keeley@ucalgary.ca.