Politics & The Bomb:
Exploring the Role of Epistemic Communities in Nuclear Non-Proliferation Outcomes.

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DECLARATION

I, Sara Zahra Kutchesfahani, confirm that the work presented in this thesis is my own. Where information has been derived from other sources, I confirm that this has been indicated in the thesis.

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ABSTRACT

The role of epistemic communities in influencing policy formulation is underexplored in International Relations theory in general and in nuclear non-proliferation studies in particular. This thesis explores how epistemic communities – groups of experts knowledgeable in niche issue areas – have affected nuclear non-proliferation policy formulation in two important and under-studied cases: the Brazilian-Argentine Agency for Accounting and Control of Nuclear Materials (ABACC) and the Nunn-Lugar Cooperative Threat Reduction (CTR) Program. It demonstrates that applying an epistemic community approach provides explanatory power heretofore lacking in explanations of these cases' origins.

The thesis applies the epistemic community framework to non-proliferation, using Haas' (1992) seminal exploration of epistemic communities in the context of natural scientific and environmental policies. Specifically, it analyses the creation and successful implementation of ABACC and the CTR Program, which, respectively, verified the non-nuclear weapon status of Argentina and Brazil and facilitated the denuclearisation of Belarus, Kazakhstan, and Ukraine. These cooperative nuclear non-proliferation agreements are shown to be the result of a process involving substantial input and direction from experts constituting epistemic communities.

The thesis explores the differences in the emergence, composition, and influence mechanisms of the epistemic communities behind ABACC and the CTR Program. It reaches the conclusion that understanding the role of an epistemic community in non-proliferation policies leads to the possibility of creating more effective non-proliferation policies in the future.

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ABACC	Brazilian-Argentine Agency for Accounting and Control of Nuclear Materials (Agéncia Brasileiro-Argentina de Contabilidade e Controle De Materiais Nucleares/Agencia Brasileño-Argentina de Contabilidad y Control de Materiales Nucleares)
AFA	Argentine Physics Association (Asociación Física Argentina)
CIS	Commonwealth of Independent States
CNEA	National Atomic Energy Commission (Comisión Nacional de Energía Atómica) Argentina
CNEN	National Nuclear Energy Commission (Comissão Nacional de Energia Nuclear) Brazil
CSIA	Center for Science and International Affairs (or Belfer Center for Science and International Affairs), Harvard University
CTR	Cooperative Threat Reduction
DOD	Department of Defense/Defense Department
DSB	Defense Science Board
EURATOM	European Atomic Energy Community
FSU	Former Soviet Union
FY	Fiscal Year
HEU	Highly Enriched Uranium
IAEA	International Atomic Energy Agency
ICBM	Intercontinental Ballistic Missile
JWG	Joint Working Group
Minatom	Russian Ministry of Atomic Energy
NIS	New Independent States
NPT	Nuclear Non-Proliferation Treaty

NSG	Nuclear Suppliers Group (also referred to as the London Club)
OPANAL	Agency for the Prohibition of Nuclear Weapons in Latin America and the Caribbean (Organismo para la Proscripción de Armas Nucleares en la América Latina y el Caribe)
PCNA	Permanent Committee on Nuclear Affairs
P.L.	Public Law
Quadripartite Agreement	Agreement of 13 December 1991 between the Republic of Argentina, the Federative Republic of Brazil, the Brazilian-Argentine Agency for Accounting and Control of Nuclear Materials and the International Atomic Energy Agency for the Application of Safeguards
SBPC	Brazilian Society for the Advancement of Science (Sociedade Brasileira para o Progresso da Ciência)
SBF	Brazilian Physics Society (Portuguese Sociedade Brasileira de Física)
SCCC	Common System of Accounting and Control of Nuclear Materials (Sistema Comum de Contabilodade e Controle/Sistema Común de Contabilidad y Control)
SLBM	Submarine-Launched Ballistic Missile
SSD	Safety, Security, and Dismantlement
START	Strategic Arms Reduction Treaty (1)
Tlatelolco	Treaty of Tlatelolco, Treaty for the Prohibition of Nuclear Weapons in Latin America making Latin America and the Caribbean nuclear-weapons free zone

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Bolbol az fayz-e gol amookht sokhan varneh nabood.
In hameh ghol-va-ghazal tabiyeh dar mengharash.

Hafez (c. 1315–1390)

The above poem by one of Persia's finest poets illustrates the huge debt of gratitude I feel towards the generous financial, intellectual, and emotional support of many individuals and organisations I received in the writing of this thesis. Loosely translated as:

It was through the blessing of a flower that the nightingale learnt how to sing.
Without the flower, the nightingale's singing would never have been heard.

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Chapter One

The Nuclear Non-Proliferation Puzzle

"Proliferation begets proliferation."

George P. Schultz, former U.S. Secretary of State (1984)

Current events indicate that the issues of nuclear weapons proliferation and non-proliferation are high on the diplomatic and international agenda. U.S. President Barack Obama has pledged to rid the world of nuclear weapons, while Iran and North Korea are advancing their nuclear weapons ambitions. Iranian suspected and North Korean declared nuclear weapons programmes have once again prompted the fear that proliferation might indeed beget proliferation. However, were we to step back and analyse the history of nuclear proliferation, we would be reassured that such an outcome is not always likely. Despite the global spread of scientific and engineering knowledge, technology, and nuclear materials since the inception of the Manhattan Project in 1939, the extensive horizontal nuclear weapons proliferation predicted by scholars and practitioners has not occurred. For the purpose of this study, the term "proliferation" is used in a horizontal, rather than vertical, context. In other words, it describes the spread of nuclear weapons to states not yet possessing them, as opposed to the increase in nuclear weapons arsenals – through the development of new and improved weapons design – of the existing nuclear weapons states. Nuclear non-proliferation, therefore, refers to the prevention of an increase in the number of countries possessing nuclear weapons.

Contrary to the fear of proliferation begetting proliferation, it is worth noting that upon a close inspection of nuclear weapons proliferation history, in every decade following the dawn of the nuclear age, fewer and fewer countries became nuclear weapon

states.[1] In the first decade of the nuclear age (1945–1955), three states tested nuclear devices (the U.S.: 1945, the USSR: 1949, and the UK: 1952). In the second decade of the nuclear age (1955–1965), two states tested nuclear explosives (France: 1960 and China: 1964). In the third decade of the nuclear age (1965–1975), only one additional state exploded a nuclear device (India: 1974). The fourth and fifth decades of the nuclear age remained dormant in that no other state tested a nuclear device, even though there was widespread belief that during this period, Israel had also become a nuclear weapon state.[2] By the sixth decade (1995–2005), India and Pakistan became fully-fledged nuclear weapons states (both tested in 1998). Currently, we are in the middle of the seventh decade (2005–2015), and so far, only one country – North Korea – has tested a nuclear device.[3] To surmise, from the first ever use of the atomic bomb in 1945 to the present day, only nine out of the 192 UN member states "have the bomb" (Schelling 1976: 77), even though approximately 30 additional states could have had the bomb because they had the technological capability of acquiring a nuclear weapons programme.[4] Why is it then that countries that could have developed a nuclear weapons programme chose not to?

In contrast to the plethora of academic literature available on why countries seek to acquire nuclear weapons (Quester 1973, Epstein 1977, Greenwood et al. 1977, Betts 1977; 1993, Dunn 1982, Meyer 1984, Spector 1984, Goldblat 1985, Davis and Frankel

[1] In this study, the definition of nuclear weapon states is taken from the Nuclear Non-Proliferation Treaty (NPT). The NPT defines a nuclear weapon state as one that has "manufactured and exploded a nuclear weapon or other explosive device prior to 1 January 1967" (Article IX, clause 3).

[2] Please note, that the precise date of when Israel became a nuclear weapon state has never been confirmed. In addition, there is no evidence to confirm that it has tested a nuclear device.

[3] North Korea's nuclear weapon status is questionable because while it is likely it exploded two nuclear devices (in 2006 and 2009), the success of those tests is debated.

[4] States with the technological capability to acquire a nuclear weapons programme include countries that were using commercial nuclear power reactors to generate electricity and had a fairly advanced civilian nuclear technology programme in place (i.e., having one or more of the following: research reactors, power reactors, nuclear engineers/scientists). While there is not a definite number of nuclear weapon capable states, various estimates range from 36–56 countries with most analysts agreeing on 40, including the number of actual nuclear weapon states (Meyer 1984: 41, Arms Control Today 1995: 33–36, Levite 2002/3: 62, Hymans 2006: 4, Blanc and Roberts 2008, Rublee 2009: 31, Müller and Schmidt 2010: 157–158).

1993, Frankel 1993, Thayer 1995, Ogilvie-White 1996, Sagan 1996/1997, Hymans 2006, Cirincione 2007),[5] there are fewer published studies exploring why countries do not seek to acquire nuclear weapons (Reiss 1988; 1995, Solingen 1994; 2007, Potter 1995, Schneider and Dowdy 1998, Paul 2000, Levite 2002/2003, Rublee 2009, Müller and Schmidt 2010).[6] The aim of this thesis is to add to these studies by examining to what extent epistemic communities – groups of experts knowledgeable in niche issue areas – can be influential in nuclear non-proliferation policy formulation. The epistemic community framework, which is discussed in more detail later in this chapter, is an approach that has not been pursued in this area before.

This chapter provides an overview of the nuclear non-proliferation puzzle and sets up the argument to be developed. It is structured in six parts. In the first section, background information on the issue of nuclear weapons proliferation and non-proliferation is provided. In the second section, the existing explanations for non-proliferation are discussed. In the third section, the insufficiency of these explanations is highlighted. In the fourth section, the theoretical approach adopted in this study is presented. In the fifth section, the cases selected to explore in this thesis are introduced. Finally, it provides an overview of the thesis.

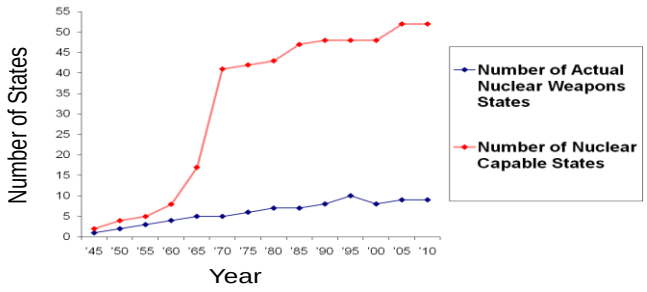
1.1 The Nuclear Non-Proliferation Puzzle

In a 1958 study of the implications of advanced military technology, the U.S. National Planning Association predicted that by 1970, "most nations with appreciable military strength will have in their arsenals nuclear weapons" (National Planning Association 1958: 41–42). In March 1963, U.S. President John F. Kennedy reiterated this concern in

[5] The dominant motivations for states to acquire nuclear weapons include security, status/power/prestige, domestic factors (including bureaucratic pressure), and technological/scientific interest.
[6] Others include Spector 1992, Liberman 2001, Campbell et al. 2004, Hymans 2006, Solingen 2007. Unpublished studies include Doyle 1997 and Walsh 2000. Most of these studies are comprised of single case studies, but some include systematic comparison of cases.

a speech before the UN General Assembly in which he famously predicted that by 1973, an additional 21 countries might develop nuclear weapons (U.S. President 1963: 280). Predictions of widespread proliferation were based on two assumptions: first, the expectation that nuclear technology would become more widely available and, second, the assumption that a decision to proliferate would trigger a cascading effect. In fact, in every decade since the discovery of the "absolute weapon" (Brodie 1946, Paul et al. 1998), the consensus view has been that nuclear weapons would spread more widely than actually occurred (see Brodie 1946, Deutsch 1957, Burns 1965, Epstein 1977, Carnesale et al. 1983, Arnett 1990, Sagan and Waltz 2003).[7] It is therefore remarkable that the number of nuclear weapon states today is far lower than originally anticipated. In more than six decades, only nine countries have become nuclear weapon states even though approximately 30 additional states could have become nuclear weapon states, as shown in Figure 1.1. Why, then, did these nuclear-weapon capable countries not pursue a nuclear weapons option?

Figure 1.1:
Potential vs. Actual Nuclear Proliferation, 1945–2010[8]



[7] See also Morgenthau 1948; 1964, Schelling 1966, Herz 1970, Betts 1977; 1993, Jervis 1976; 1979–1980; 1988; 1989, Myrdal 1975, Quester 1973, Bundy et al. 1982, Mandelbaum 1983, Mearsheimer 1984/1985; 1990; 1993, Meyer 1984, Mueller 1988, Schell 1982, Waltz 1981; 1990, Weltman 1981/1982, Beinart 1998, Chafetz 1993, Dunn 1991, Frankel 1993, Allison 2004, Lavoy 2006, Rosen 2006, Tertrais 2006, Cirincione 2007.

[8] This figure is taken from Hymans who graphically charted nuclear capable states against nuclear actual states in five yearly increments from 1950–1990/2000 (Hymans 2006: 4). Using both his model and data from Meyer 1984, Arms Control Today 1995, Levite 2002/3, Roberts 2008, Rublee 2009, and Müller and Schmidt 2010, this figure shows potential versus actual nuclear proliferation from 1945 to the present day.

1.2 Existing Explanations for Nuclear Non-Proliferation

International Relations (IR) theories provide convincing arguments that explain why there are so few nuclear weapon states. Described as "the most effective instrument to moderate the effects of systemic characteristics" (Frankel 1993: 37), the provision of superpower security guarantees was seen by many realists as a specific mechanism through which to curb nuclear proliferation (Waltz 1981, Meyer 1984, Van Evera 1990/1991, Deudney 1993, Frankel 1993, Reiss 1995, Thayer 1995, Greenwood et al. 1997, Mearsheimer 1998). The security guarantees argument maintains that although strong states may be able to secure themselves against threats by acquiring a nuclear weapons programme, weaker states may instead seek to secure themselves by aligning with a powerful, nuclear-armed ally – a concept known as extended deterrence. This argument predicted that positive security guarantees extended by the superpowers throughout the Cold War would ensure nuclear restraint. During the Cold War, the USSR and the U.S. extended positive security guarantees to their allies to protect them under their respective nuclear umbrellas. This proved to be a successful strategy because many countries were prevented from pursuing a nuclear weapons programme. This approach is best illustrated by the Warsaw Pact countries which had no choice but to remain non-nuclear or risk damaging their relations with the Soviet Union.[9] Similarly, many U.S. allies, including Japan, Taiwan, South Korea, and several Western European states, were persuaded to give up their nuclear weapons ambitions by a U.S. security guarantee (including the NATO nuclear umbrella), which allowed them to feel confident of their security situation.[10] Ariel E. Levite's research on "nuclear reversal" fits with the

[9] Warsaw Pact (1955–1991) countries included the Soviet Union, Poland, East Germany, Czechoslovakia, Hungary, Romania, Bulgaria, and Albania.

[10] Japan was protected under the U.S. nuclear umbrella through the 1960 Treaty of Mutual Cooperation and Security. Germany, Italy, the Netherlands, Norway, and Spain are NATO members and are therefore protected under NATO's nuclear umbrella. Australia has a military alliance with the U.S. through the 1951 ANZUS Treaty. South Korea (1953, U.S.-R.O.K. Mutual Defense Treaty) and Taiwan (1979, Taiwan

realist thesis since he argues that a combination of the provision of security guarantees and domestic regime change led states to pursue non-proliferation policies (2002/2003). He pursues this argument with reference to the case of Germany in which he argues that regime change coupled with the extension of U.S. security guarantees led to the renunciation of Germany's indigenous nuclear weapons capability (2002/2003: 83–85).

A second influential explanation for the scarcity of nuclear states is the neo-liberal institutionalist perspective, which seeks to explain how international institutions and regimes increase the possibilities of cooperation between states. This argument puts forward the notion that states cooperate with international institutions and regimes because of lowered transactions costs and greater transparency (Keohane and Nye 1977, Keohane 1984; 1989, Baldwin 1993, Axelrod and Keohane 1986; 1993, Lipson 1993, Doyle 1997a). The Nuclear Non-Proliferation Treaty (NPT) is the centrepiece of the nuclear non-proliferation regime and many academics have cited the salutary effects of the regime in curtailing proliferation (Greenwood et al. 1977, Nye, 1981; 1985; 1987, Meyer 1984, Smith 1987, Reiss 1988, Sagan 1996/1997).[11]

Within the non-proliferation regime, rules and norms are established through the NPT, the International Atomic Energy Agency (IAEA), and nuclear weapon free zones.[12] The NPT was opened for signature in July 1968 and entered into force in March 1970, with the intention to prevent the spread of nuclear weapons. Over the years, 189

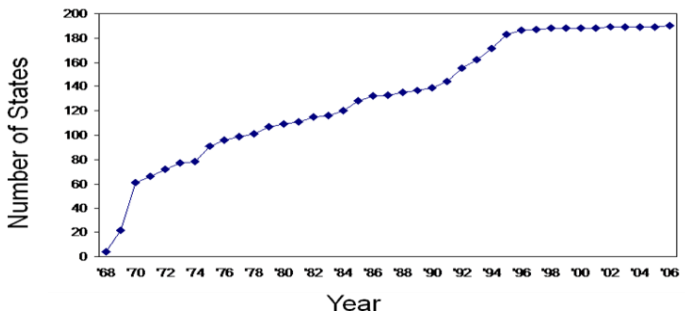
Relations Act) were given U.S. security guarantees when their respective nuclear weapons ambitions were abandoned.

[11] The origins of the regime can be traced to December 1953, with President Eisenhower's Atoms for Peace Program (Nye 1985: 17).

[12] Nuclear weapon free zones are areas throughout the world that are protected against the use, storage, and testing of nuclear weapons. Today, there are seven nuclear weapon free zones: (1) Antarctic Treaty, 1959, which covers Antarctica; (2) Tlatelolco Treaty, 1969, which covers South America, Latin America, and the Caribbean; (3) Rarotonga Treaty, 1983, which covers the South Pacific (i.e., Australia, the Cook Islands, Fiji, Kiribati, Nauru, New Zealand, Nieu, Papua New Guinea, the Solomon Islands, Tonga, Tuvalu, Vanuatu, and Western Samoa); (4) Bangkok Treaty, 1995, which covers South East Asia (i.e., Brunei, Cambodia, Indonesia, Laos, Malaysia, Myanmar, Philippines, Singapore, Thailand, and Vietnam); (5) Pelindaba Treaty, 1996, which covers Africa (54 independent African states); (6) Mongolia, 2000, the first instance of a single state declaring its sovereign territory nuclear free; and (7) Semi-Palatinsk Treaty, 2006, which covers Central Asia (i.e., Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan, and Uzbekistan).

countries (including the first five nuclear weapon states) signed the Treaty, as shown in Figure 1.2.[13] The NPT established a two-tier bargaining system between the five recognised nuclear weapon states (the nuclear haves: the U.S., Russia, the UK, France, and China) and all the other signatories (the nuclear have-nots). The five nuclear weapon states pledged to work towards nuclear disarmament and to help the non-nuclear weapon states acquire peaceful nuclear technology; in exchange, the non-nuclear weapon NPT signatories agreed never to seek nuclear weapons programmes.[14] Proponents of this institutional IR perspective point out that of these signatories, most states never tried pursuing a nuclear weapons programme and that only five signatories are nuclear weapon states. Therefore, neoliberal institutionalists may argue that states complied with the non-proliferation regime because the benefits (e.g., assistance with nuclear energy programmes and technology transfers) outweighed the costs of a nuclear weapons programme (e.g., economic and political).

Figure 1.2:
Number of States Ratifying the NPT, 1968–2006 [15]



[13] Of the five recognised nuclear weapon states, three signed the NPT in 1968 (U.S., USSR, and UK) and two in 1992 (France and China). Every country in the world has signed the treaty, with the exception of India, Israel, Pakistan, and North Korea. North Korea had signed the NPT, but in 2003, it withdrew from the treaty.

[14] To further the goal of non-proliferation and as a confidence-building measure between its signatories, the treaty establishes a safeguards system under the responsibility of the IAEA. Safeguards are used to verify compliance with the treaty through routine inspections conducted by the IAEA. The treaty promotes cooperation in the field of peaceful nuclear technology and equal access to this technology for all signatories, while safeguards prevent the diversion of fissile material for weapons use (UN Department of Disarmament Affairs 2002). Within the regime, nuclear technology supplies are controlled through a number of multilateral export-control agreements, including the Nuclear Suppliers Group (1974) and the Zangger Committee (1971–1974). These agreements make it extremely difficult for countries to acquire nuclear weapons technology.

[15] The figures pertaining to when states ratified the NPT were collected from the United Nations Office for Disarmament Affairs website.

Etel Solingen's research on nuclear forbearance is embedded within neoliberal institutionalism. She argues that economic liberalism coupled with democratisation is a useful approach in explaining nuclear non-proliferation (1994). She posits that economic benefits of complying with the nuclear non-proliferation regime prompted domestic coalitions into supporting a non-nuclear weapons policy, and in states where these coalitions had strength, they moved towards this policy. In order to gain the benefits of foreign investment and integrate further into the international economy, states gave up their nuclear ambiguity. Solingen pursues this argument with reference to the case of South Africa, the only country known to have manufactured nuclear weapons and then voluntarily dismantled them. She notes that after the end of apartheid, South Africa wanted to normalise its relations with the international community and also "gain access to the IAEA club" (1995: 211). A post-apartheid South Africa wanted an end to its international isolation in order to integrate into the international economy and one way to do this was to sign the NPT, which it did in 1991. As shown in Figure 1.2 above, by 1991, a vast majority of UN member states (144) had already signed the NPT, thereby granting them access to the "IAEA club". South Africa's signature on the treaty not only granted it access to the IAEA club, but also to the wider international community.[16]

Harald Müller and Andreas Schmidt take Solingen's main proposition one step further by arguing that the combination of the existence of the NPT and democracy/democratisation is a sufficient cause for nuclear non-proliferation (2010: 128). In their research, they analyse the political systems of countries in relation to the start of nuclear weapon activities post-1970. They conclude that from a post-1970 perspective (i.e., after the existence of the NPT), no single democracy was inclined to start any nuclear weapon activities and that countries that became democracies renounced their

[16] For more on the South African nuclear reversal/rollback, see de Villiers, Jardine, and Reiss 1993, Reiss 1995, Stumpf 1995/1996, Paul 2000, Long and Grillot 2000, Liberman 2001, Kutchesfahani and Lombardi 2008.

nuclear weapon activities. One of the examples that they use to support this argument is the case of Spain, an autocratic country that had started nuclear weapon activities in 1970. Yet, over the years, it transitioned to a democratic country, subsequently renouncing its nuclear weapons ambitions (2010: 37).

A third explanation in the literature emphasises that the international norm against the possession of nuclear weapons dissuades countries from pursuing a nuclear weapons option. This constructivist approach focuses on how international norms emerge and converge around institutions, emphasising normative pressure (Checkel 1997, Finnemore and Sikkink 1998, Barnett and Finnemore 1999). Scholars refer to different categories of norms: regulative norms, constitutive norms, and evaluative/prescriptive norms (Katzenstein 1996, Checkel 1997, Finnemore and Sikkink 1998, Risse 1999). Regulative norms order and constrain behaviour; constitutive norms create new actors, interests, or categories of action; and evaluative/prescriptive norms entail a moral judgement (Finnemore and Sikkink 1998: 891). Therefore, the norm against the possession of nuclear weapons – which was developed after the Hiroshima and Nagasaki bombings – can be best understood as a mechanism for constraining behaviour and as a moral rejection of nuclear weapons. While some advocates of norms-based explanations for constraining nuclear behaviour refer to a "nuclear taboo" – which is based on nuclear non-use rather than on nuclear non-proliferation (Schelling 1976, Price and Tannenwald 1996, Tannenwald 1999; 2005; 2007) – two scholars have considered the roles of norms in explaining states' nuclear non-proliferation decisions. In his research on nuclear non-proliferation, T. V. Paul argues that states may believe that their acquisition of nuclear weapons would "hurt the international norms and laws that give them legitimacy and power. General adherence to regime principles and norms and observance of the NPT

appear to restrain other states in the region" (2000: 28).[17] This suggests that because of the norms created and maintained by the international nuclear non-proliferation regime, states would not want to acquire nuclear weapons. Maria Rost Rublee (2009) subscribes to Paul's approach because in her research she examines the "social environment" – the norms and ideas which shape how state decision makers conceptualise security and the value of nuclear weapons – and concludes that the normative power of the nuclear non-proliferation regime was an effective mechanism in nuclear weapons restraint.

The nuclear non-proliferation norm has dissuaded at least one country – Switzerland – from pursuing a nuclear weapons programme. Switzerland signed the NPT in 1969, but, upon signing, made it clear that it would wait until other countries ratified before it did. When Switzerland signed the treaty in 1969, it did so with the following declaration:

> On the occasion of the signature today of the Treaty for the Non-Proliferation of Nuclear Weapons, the Swiss Government expressly declare that they will not submit the Treaty to Parliament for its approval until such time as they consider that a sufficient measure of universal support has been obtained by the Treaty (United Nations, "Multilateral Arms Regulation and Disarmament Agreements," undated).

Switzerland waited until 1977 before it ratified the NPT, by which time 97 states had ratified (shown in Figure 1.2 above) and the non-proliferation norm had become significant.

A further constructivist explanation of nuclear non-proliferation can be found in the work of Jacques E. C. Hymans (2006). Similar to Solingen, Hymans focuses on the domestic factors of non-proliferation. He argues that a specific type of threat perception – that are socially constructed – combined with a specific type of national identity,

[17] Paul argues that no single variable can explain nuclear non-proliferation. While he does not discount the NPT and the non-proliferation norm in his research, his main argument surrounds a state's external security environment, including the number, scope, intensity, and duration of militarised disputes in which the state is involved. His explanation for why states do not pursue nuclear weapons is based on his notion of "prudential realism" in which states "balance their interests and capabilities so as to minimise the security challenges they pose to others and in expectation of reciprocal benign behaviour in return" (2000: 5).

creates a high probability for nuclear weapons acquisition. The case of Australia's nuclear weapons renunciation illustrates Hymans' proposition. When Australian decision makers had both the perception of a serious security threat and a high level of nationalism, Australia moved towards nuclear weapons acquisition. However, when decision makers had only one or neither of these, Australia moved towards nuclear weapons renunciation (2006: 114–140).[18]

1.3 Insufficiency of Existing Non-Proliferation Approaches

Although the existing non-proliferation approaches are useful in understanding the gap between the number of capable versus actual nuclear weapon states (illustrated in Figure 1.1), empirical evidence indicates that these explanations are not fully sufficient in understanding every case of non-proliferation. Two different sets of countries whose non-proliferation outcome cannot be fully explained by the existing theoretical explanations stand out: (1) Argentina and Brazil, two countries that were suspected of pursuing a nuclear weapons programme, and (2) Belarus, Kazakhstan, and Ukraine, three countries that relinquished the nuclear weapons they inherited after the collapse of the Soviet Union.[19]

Argentina and Brazil were two countries that could have developed a nuclear weapons programme yet chose to remain non-nuclear weapon states. Between the 1950s and 1980s, both countries were widely suspected by the international community to be

[18] Prior to 1972, Australia kept its nuclear weapons option open. However, in 1972, there was a change in the political leadership of the country leading to the definitively anti-nuclear weapons, pro NPT Labour Party coming to power, culminating in an end to the desire to pursue an Australian nuclear weapons programme (Walsh 1997).

[19] In addition to Argentina, Brazil, Belarus, Kazakhstan, and Ukraine, other countries such as Sweden, Switzerland, South Africa, Libya, and Iraq also present theoretical and empirical non-proliferation anomalies. For a discussion on explanations vis-à-vis most cases of nuclear non-proliferation, see Kutchesfahani 2010. (For more on the reasons behind Sweden's non-nuclear acquisition, see Garris 1973, Cole 1994, Reiss and Litwak 1994, Prawitz 1995, Long 1996, Paul 2000. For more on Switzerland's non-nuclear acquisition, see Paul 2000. For more on South Africa's denuclearisation, see de Villiers, Jardine, and Reiss 1993, Reiss 1995, Stumpf 1995/1996, Paul 2000, Long and Grillot 2000, Liberman 2001, Kutchesfahani and Lombardi 2008. For more on Libya's non-nuclear acquisition, see Jentleson and

pursuing a covert nuclear weapons programme. This was due to a number of reasons, including their longstanding regional rivalry, their ambitious efforts to master the nuclear fuel cycle in their pursuit for technical autonomy, and their disdain towards the international nuclear non-proliferation regime. Argentina and Brazil were longstanding regional rivals under military rule and had consistently competed for regional hegemony. Furthermore, both nations had indigenously developed some aspects of the nuclear fuel cycle and possessed nuclear facilities that were not subject to regional or international safeguards. Similarly, both nations showed increasing disdain towards the international nuclear non-proliferation regime, particularly the NPT and the Treaty of Tlatelolco, which Argentina and Brazil both objected to and repeatedly refused to sign and ratify.[20] Such reasons fuelled international suspicions that both nations were indeed intent on acquiring a nuclear weapons programme. However, in spite of their ambitious covert efforts to develop a nuclear weapons option, Argentina and Brazil remained non-nuclear weapon states.

The existing non-proliferation explanations are not fully applicable to the case of Argentina and Brazil because throughout their quest for nuclear technology autonomy throughout the 1950s and 1980s, neither country enjoyed good relations with the U.S. or with the USSR, and therefore a security guarantee from either superpower was not considered an option. Similarly, neither country expressed an interest in signing the NPT because both states deemed the treaty and, by extension, the non-proliferation regime, as discriminatory and illegal. In addition, during their pursuit of nuclear technology autonomy, neither country subscribed to the non-proliferation norm. Most studies argue that Argentina and Brazil ended their efforts to develop a nuclear weapons option when

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Whytock 2005/2006, Bowen 2006, Solingen 2007. For more on Iraq's non-nuclear acquisition, see Solingen 2007.)

[20] It should be noted that Brazil did sign Tlatelolco in 1967, but it did not ratify it until 1994. Argentina did not sign and ratify the Treaty until 1994.

they both became democracies in the mid 1980s – Argentina in 1983, Brazil in 1985 (Carasales 1992; 1995, Lamazière and Jaguaribe 1992, Goldemberg and Feiverson 1994, Redick, Carasales, and Wrobel 1995, Solingen 1994, Redick 1995; 1996, Wrobel and Redick 1998, Wrobel 1999).[21] However, although their efforts to develop a nuclear weapons option ceased when they became democracies, it is important to note that negotiations on nuclear issues between the two states had already begun in 1980, when both nations were ruled under military leaderships. These negotiations continued throughout the 1980s and early 1990s prompting the creation of the Brazilian-Argentine Agency for Accounting and Control of Nuclear Materials (ABACC) in 1991.[22] The creation of ABACC is therefore one of the most important factors in Argentina and Brazil's non-proliferation outcome since it established joint mutual inspections of both countries' nuclear facilities verifying their non-nuclear weapon status. Interestingly, its creation and how it verified both countries' non-nuclear weapon status has been overlooked in the existing non-proliferation explanations. While both nations were initially hostile to the non-proliferation regime, it is interesting to note that *after* the creation of ABACC in 1991, Argentina and Brazil became fully integrated within the non-proliferation regime by signing various international non-proliferation agreements, including the NPT.[23]

A further set of countries whose non-proliferation outcome cannot be fully explained by the existing theoretical explanations are the former Soviet Union states of Belarus, Kazakhstan, and Ukraine. When the Soviet Union collapsed in late 1991, Ukraine, Kazakhstan, and Belarus inherited an estimated 4,025, 1,400, and 825 Soviet

[21] Other notable texts include Levanthal and Tanzer (eds.) 1992, Stanley 1992, Marzo, Biaggio, and Raffo 1994, Serrano 1994, Reiss 1995, Hirst 1998, Barletta 2001, Hymans 2006, Doyle 2008.
[22] Please note that ABACC was created in July 1992, after Presidents Menem (of Argentina) and Collor (of Brazil) took the decision in July 1991 (through the Guadalajara Agreement) to establish a bilateral verification inspection agency.
[23] Argentina and Brazil signed various agreements with the IAEA (Quadripartite Agreement, 1991) and ratified the Treaty of Tlatelolco (1994) and the NPT (Argentina in 1995, Brazil in 1998).

nuclear weapons respectively, making them, overnight, the third, fourth, and eighth largest nuclear powers in the world (Lugar 2001: xiii).[24] Most studies argue that Belarus, Kazakhstan, and Ukraine relinquished their nuclear weapons because of the high costs and low benefits attached to their inherited nuclear weapons (Spector 1992, Lepingwell 1993a; 1993b, Reiss 1995, Shields and Potter 1997, Bertsch and Potter 1999, Stevens 2008), and not necessarily because of security guarantees, the NPT, the non-proliferation norm, or democratisation. As three newly formed independent nuclear-inherited states, they did not have a security guarantee or a signature on the NPT. It should be noted, however, that over time, security guarantees were offered and signatures on the NPT appeared, but this was not until *after* all countries agreed to assistance from the Nunn-Lugar Cooperative Threat Reduction (CTR) Program.[25] Through the CTR Program – a U.S.-led intellectual and funding resource – Belarus, Kazakhstan, and Ukraine were able to denuclearise.[26] Similar to ABACC, the creation of the CTR Program and how it facilitated the denuclearisation of the three former Soviet states has been overlooked in the existing non-proliferation explanations.

1.4 Epistemic Community Framework

In order to gain a more complete understanding of non-proliferation outcomes and to supplement existing explanations, there is a need to broaden explanations to include more actors (including scientists and experts) as key actors in non-proliferation. While the non-proliferation outcome of Argentina and Brazil and the denuclearisation of Belarus, Kazakhstan, and Ukraine are well documented, the existing literature lacks an analysis of where the ideas behind ABACC and the CTR Program came from. The

[24] Figures taken from Norris (1992: 25) who quotes from the Natural Resources Defense Council. The precise number of Soviet nuclear weapons deployed in the newly independent states were regarded as state secrets. The numbers provided are the estimates of subject matter experts.
[25] Ukraine was the only country to receive security assurances from the U.S., UK, and Russia.
[26] In this thesis, the CTR Program refers to all the various programmes managed by the U.S. Departments of State, Energy, Defense, and Commerce, and their counterparts in the former Soviet Union.

process of how and why these agreements materialised remain under explored. Within the existing explanations relating to the scarcity of nuclear weapon states, little attention has been given to the role of non-proliferation experts. In order to rectify this gap, this thesis investigates to what extent the epistemic community approach opens up new understandings though an analysis and tracing of the origins of two important and understudied cooperative nuclear non-proliferation agreements.

The epistemic community framework was introduced to IR scholars by Peter M. Haas (1989; 1992b) to study the role and impact of ideas in international relations and in international policy coordination. In a seminal issue of the journal *International Organization* entitled "Knowledge, Power and International Policy Coordination", scholars suggested that the concept of an epistemic community should be treated as an alternative approach to the study of international policy coordination and change along with neorealism, neoliberalism, dependency and post-structural approaches (Haas 1992a). They argued that the epistemic community approach analyses relations between the epistemic community and the behaviour of states in international policy coordination (Haas 1992a; 1992b, Adler and Haas 1992). The epistemic community framework was therefore a further model used to explain patterns of international cooperation and policy change in world politics. Described as a "network of professionals with recognised expertise and competence in a particular domain and an authoritative claim to policy-relevant knowledge within that domain or issue area" (Haas 1992b: 3), epistemic communities can often influence state decisions.[27] Through their knowledge and

[27] Haas defined the concept of an epistemic community as: "a network of professionals from a variety of disciplines and backgrounds. They have (1) a shared set of normative and principled beliefs, which provide a value-based rationale for the social action of community members; (2) shared causal beliefs, which are derived from their analysis of practices leading or contributing to a central set of problems in their domain and which then serve as the basis for elucidating the multiple linkages between possible policy actions and desired outcomes; (3) shared notions of validity – that is, intersubjective, internally defined criteria for weighing and validating knowledge in the domain of their expertise; and (4) a common policy enterprise – that is, a set of common practices associated with a set of problems to which their professional competence is directed, presumably out of the conviction that human welfare will be enhanced as a consequence" (1992b: 3).

expertise in niche issue areas (e.g., in highly technical and complex issue areas) and their access to decision makers, members of an epistemic community influence decisions when decision makers are faced with conditions of uncertainty and complexity.[28] When uncertainty and complexity constrain state decision makers' actions, they often demand particular sorts of scientific or technical information and expertise. Meeting these demands can require considerable technical or scientific expertise. Epistemic communities are one possible provider of such information and advice because they are capable of producing and providing this information due to their possession of policy-relevant knowledge. Therefore, uncertainty provides both an opening and an opportunity for an epistemic community to influence state decision makers.

The application of the epistemic community framework has been particularly prevalent in the realm of natural scientific and environmental policies (Haas 1989; 1990; 1992c, Peterson 1992, Hjorth 1994, Baark and Strahl 1995, Ringius 1997, Betsill and Pielke 1998, Lidskog and Sundqvist 2002). In the field of international security however, the epistemic community approach has been relatively under explored.[29] Indeed, in their concluding paper to the seminal volume dedicated to epistemic communities in *International Organization*, Adler and Haas encourage further research on epistemic communities to explore the existence of epistemic communities in the nuclear non-proliferation field (1992: 387). Given both this encouragement and the fact that the epistemic community approach is under explored in the field of international security,

[28] "Uncertainty" refers to periods when state decision makers lack specialist knowledge in complex and technical issue areas. "Complexity" refers to the nature of the issue areas, whether they are political, social, economic, or scientific. In past studies of epistemic communities, these issues have included monetary/economic (Verdun 1999, van Daele 2005), macroeconomic (Ikenberry 1992), biodiversity (Raustiala 1997), environmental (Haas 1989; 1990; 1992c, Peterson 1992, Hjorth 1994, Baark and Strahl 1995, Ringius 1997, Betsill and Pielke 1998, Lidskog and Sundqvist 2002), security (Adler 1992, Mendelson 1993, Wright 1997), population (Drake and Nicolaïdis 1992), plant genetics (Sauvé and Watts 2003), and innovation and technology (Sharif 2006).

[29] The application of the epistemic community approach to international security issues include Adler 1992 (nuclear arms control), Mendelson 1993 (changes to Soviet foreign policy), Wright 1997 (conventional arms control), and Barth 2006 (nuclear arms control).

this thesis applies the framework to non-proliferation, an area that has yet to be explored. Therefore, the main focus of this research is to examine the role of a nuclear non-proliferation epistemic community in non-proliferation policy formulation in the cases under review.

It should be noted that it is not the intention of this research to suggest that the epistemic community's role in persuading state decision makers to pursue a nuclear non-proliferation policy is a monocausal explanation. In fact, the epistemic community framework is not being used as an alternative explanation per se, but as an intervening mechanism in a larger process. Many scholars working on understanding why and how the countries in both cases did not pursue a nuclear weapons programme agree that no single factor alone can explain the non-proliferation outcomes (Potter 1995, Reiss 1995, Paul 2000, Levite 2002/3, Doyle 2008). This study therefore appreciates the possibility of equifinality (in other words, the notion of multiple causality and several explanatory paths that lead to the same outcome) in explaining the non-proliferation outcome of the countries under review given that alternative processes (e.g., transition to democracy and economic liberalism) and several other explanatory factors (e.g., international factors, and especially the role of the U.S.) were at play. However, what remains unexplored in the literature is the role of an epistemic community in creating the non-proliferation agreements under review and this is the gap in the literature that this thesis rectifies. The role of an epistemic community in both cases is therefore a further important and under explored angle to consider in explaining the process which led to the non-nuclear weapon acquisition of these countries.

1.5 Case Study Selection

The cases selected for this study are two cooperative nuclear non-proliferation agreements: ABACC and the CTR Program. These agreements were key factors behind

Argentina and Brazil's non-proliferation and Belarus, Kazakhstan, and Ukraine's denuclearisation, respectively. While it might appear that there is a difference between the two agreements given that Argentina and Brazil never became nuclear weapon states whereas Belarus, Kazakhstan, and Ukraine relinquished their inherited nuclear weapons, it should be noted that both cases are examples of non-proliferation agreements. Earlier, the term non-proliferation was defined as preventing an increase in the number of countries possessing nuclear weapons. As such, the two cases present two different conceptualisations of non-proliferation: on the one hand, an agreement that verified the non-nuclear weapon states of two countries that did not pursue a nuclear weapons programme in spite of their capability and widespread suspicion (e.g., Argentina and Brazil), and on the other hand, an agreement that facilitated the denuclearisation of three countries that inherited nuclear weapons, but decided to relinquish them (e.g., Belarus, Kazakhstan, and Ukraine). Through the examination of two explanatory case studies, this thesis analyses the role of epistemic communities in the creation of ABACC and the CTR Program and on how these two non-proliferation agreements facilitated the non-proliferation of Argentina and Brazil and Belarus, Kazakhstan, and Ukraine's nuclear renunciation, respectively.[30]

ABACC and the CTR Program are two examples of many cooperative nuclear non-proliferation agreements.[31] With the exception of Adler's (1992) study on a nuclear arms control epistemic community that led to the creation and subsequent implementation of the ABM Treaty, very little research has been conducted on the roles

[30] The explanatory method uses theory to explain the causes and patterns of historical cases (van Evera 1997: 92).

[31] Other notable examples include the NPT, nuclear weapon free zones (e.g., the Antarctic Treaty, the Tlatelolco Treaty, the Rarotonga Treaty, the Bangkok Treaty, the Pelindaba Treaty, the Semi-Palatinsk Treaty), the Agreed Framework (signed between the U.S. and North Korea in 1994), the Anti-Ballistic Missile (ABM) Treaty, the Fissile Material Cut-Off (FMCT) Treaty, the Intermediate-Range Nuclear Forces (INF) Treaty, the Nuclear Suppliers Group (NSG), and the Strategic Arms Reduction (START) Treaty I, II, and III.

of epistemic communities in creating international security policies. By focusing on ABACC and the CTR Program, this study will add to the relatively under explored area of analysing how two nuclear non-proliferation agreements facilitated non-proliferation and denuclearisation in the respective countries. In addition, this research seeks to complement Adler's study on an arms control epistemic community by providing an analysis into two different non-proliferation epistemic communities.

1.6 Outline of the Thesis

Given that the existing explanations provided for non-proliferation are not fully sufficient to the non-nuclearisation of Argentina and Brazil and the denuclearisation of Belarus, Kazakhstan, and Ukraine, this thesis examines the role that epistemic communities played in the creation of ABACC and the CTR Program. The analysis illustrates how these non-proliferation agreements facilitated Argentina and Brazil's non-nuclearisation and Belarus, Kazakhstan, and Ukraine's denuclearisation, respectively. Based on these cases, we can infer under what conditions epistemic communities can promote non-proliferation policies. In addition, this study can shed light on the applicability of this framework to nuclear non-proliferation policymaking.

The thesis is structured as follows. Chapter Two analyses the theoretical framework of epistemic communities used in this thesis. It focuses on the framework developed by Haas – the most widely applied by scholars today – since most of the existing literature on epistemic communities use it as a theoretical lens to explain the role of these expert communities in international policymaking. Subsequently, the chapter provides an overview of the epistemic community literature and discusses the limitations associated with its application as a framework. Most research finds the framework to be a compelling and useful approach in understanding how and why different policies emerge (Adler 1992, Hopkins 1992, Haas 1992a, Verdun 1999, Sauvé and Watts 2003, Van Daele

2005), but other research reveals weaknesses in this approach (Drake and Nicolaïdis 1992, Peterson 1992, Sebenius 1992, Risse-Kappen 1994, Baark and Strahl 1995, Jacobsen 1995, Finnemore 1994, Evangelista 1995, Mendelson 1993). As mentioned earlier, there has been very little research on the role of epistemic communities in international security policy formulation. This study makes a contribution to the literature on epistemic communities because it analyses policies related to international security and, in particular, the non-proliferation of nuclear weapons.

Chapter Three describes the research design and methodology used in this study – notably case study research design and process tracing – to empirically investigate the role of epistemic communities in nuclear non-proliferation outcomes. The data was collected from both primary and secondary sources. Primary sources included elite interviews conducted with knowledgeable academics, policymakers and government officials (including diplomats and decision makers) in Austria, Argentina, Brazil, Russia, Sweden, the UK, and the U.S. between June 2008 and October 2009.[32] The elite interviews were conducted to better understand when and why the motivations behind nuclear non-acquisition were realised, how often experts within the community met with one another, and what ties or access channels existed between experts and decision makers. These interviews were crucial in establishing to what extent the epistemic community was able to exert an influence on state decision makers. Other primary sources included conference proceedings, congressional hearings and testimonies, official documents (e.g., texts of joint declarations and legislation), and articles written by former

[32] For the ABACC case, 18 interviews were conducted in English, apart from one, which was conducted in Spanish, and translated by a native Spanish speaker (Coromoto Power Febres). For the CTR Program case, 27 interviews were conducted in English. Interviews were conducted face-to-face, over the phone, and via email. Most face-to-face and telephone interviews lasted about one hour, although they ranged from half an hour to four and a half hours in length. Due to the sensitivity of the subject being discussed, none of the interviews were recorded. Instead, detailed notes were taken throughout the interview. The UCL Data Protection Registration Reference Number for this study is Z6364106/2010/03/15, Section: 19, Research. Most interview subjects requested confidentiality and for the purpose of consistency, all interview subjects have been anonymised.

and current government officials. Secondary sources included newspaper articles, websites (such as www.abacc.org), and both scholarly and policy articles and books.

Chapters Four and Five examine the role of an Argentine-Brazilian epistemic community in the creation of the policy behind ABACC. In Chapter Four, historical background on Argentina and Brazil's suspected nuclear weapons programme is provided, and the emergence of an Argentine and Brazilian nuclear non-proliferation epistemic community is analysed. In Chapter 5, the process of how the epistemic community influenced the creation of the policy behind ABACC between 1980 and 1991 is examined. The main objective of this case study analysis is to examine to what extent an epistemic community was influential in the creation of ABACC.

Chapters Six and Seven examine the role of an American-Soviet/Russian non-proliferation epistemic community in the creation of the policy behind the CTR Program. In Chapter Six, the scope of Belarus, Kazakhstan, and Ukraine's inherited nuclear legacy is analysed, and the emergence of the American-Soviet/Russian nuclear non-proliferation epistemic community is discussed. In Chapter Seven, the process of how the epistemic community influenced the creation of the CTR Program is examined. The main objective of this case study analysis is to examine to what extent the U.S. and Soviet/Russian nuclear non-proliferation epistemic community was influential in the creation of the Nunn-Lugar CTR Program which, inter alia, facilitated the denuclearisation of the three former Soviet states.

The final chapter, the Conclusions, addresses the thesis overall contributions. It revisits the central themes that run through the thesis and summarises the key theoretical and empirical findings that emerged from the discussion of the role of epistemic communities in both case studies. The thesis asserts that epistemic communities not only play a fundamental role in international policy coordination but also deserve a central place in our understanding of nuclear non-proliferation outcomes. It also critically

evaluates the analytical framework introduced in Chapter Two and applied in both cases and analyses the epistemic community framework's principal strengths and limitations. It concludes by explaining the limitations of the study and proposing suggestions for further research.

Chapter Two

Applying the Epistemic Community Framework to Analyse the Creation of Cooperative Nuclear Non-Proliferation Agreements

> "Knowledge is the sum of technical information and of theories about that information which commands sufficient consensus at a given time among interested actors to serve as a guide to public policy designed to achieve some social goal."
>
> Ernst B. Haas (1980: 367–368)

The main objective of this chapter is to present the theoretical and conceptual framework of *epistemic communities*. Given that the aim of this thesis is to examine to what extent epistemic communities can be influential in nuclear non-proliferation policy formulation, it is important to discuss the framework that will be applied to this study. The term "epistemic community" has been defined or used in a variety of ways, most often to refer to communities of (scientific) experts (Foucault 1970, Holzner 1972, Ruggie 1975, Haas 1989; 1992b, Antoniades 2003). Etymologically derived from the Greek word "ἐπιστήμη" (episteme), the term refers to knowledge or science. Over the years, the concept of episteme evolved from referring to a shared faith in the scientific method as a way of generating truth (Holzner 1972), as a dominant way of looking at social reality (Foucault 1970, Ruggie 1975), as a way to explore global governance (Haas 1989; 1992b), and as a way to dominate social discourse and social practice (Antoniades 2003). As a framework, it was introduced to International Relations (IR) scholars by Peter M. Haas (1989; 1992b) to study the role and impact of ideas in international relations and in international policy coordination.[33]

[33] While Haas's model is the most widely accepted and applied in IR, it should be noted that the epistemic community framework was originally introduced to IR scholars by Ruggie (1975). Ruggie borrowed the term "episteme" from Foucault (1970) and combined it with Holzner's concept of the "'proper' construction of reality" (1972: 60–71). Neither Ruggie nor Foucault provided a clear definition of an epistemic community, but instead focused their explanations on the term episteme. They described an episteme as "a dominant way of looking at social reality, a set of shared symbols and references, mutual expectations and a mutual predictability of outcomes" (Ruggie 1975: 569–570). They therefore associated epistemic communities with broader and more-widespread social beliefs rather than with the more limited set of shared beliefs held by experts. Ruggie defined an epistemic community as "interrelated roles which grow up around an episteme; they delimit, for their members, the proper construction of social reality

Epistemic communities represent networks of knowledge-based experts that help articulate cause-and-effect relationships of complex problems, define the self-interests of a state, or formulate specific policies for state decision makers. In short, they assist the policy process. As a framework, it is useful for analysing the role of non-proliferation experts – i.e., scientists and knowledgeable professionals – in policy-making. This is because it assists in analysing and assessing the importance of scientists and experts behind the creation of new non-proliferation agreements since it focuses on the role of these experts in nuclear policy formulation. Furthermore, it seeks to fill the gaps in our knowledge regarding the origins of international policies by proposing as a source of policy the ideas and political influence of a network of experts with policy-relevant knowledge. Moreover, the role of knowledge and scientific expertise in nuclear non-proliferation policy formulation – particularly the role of non-proliferation experts behind the creation of cooperative nuclear non-proliferation agreements – has been overlooked within the IR literature.

The chapter is structured in four parts. The first section introduces the epistemic community framework, including a discussion on its key features, when it is likely to emerge, and how it influences the creation of policies that are subsequently implemented by state decision makers. The second section outlines the importance of knowledge and scientific expertise in policy formulation. The third section conceptualises the nuclear non-proliferation epistemic community by applying the epistemic community framework, drawing on insights from the existing epistemic community literature to better understand to what extent the experts behind the creation of ABACC and the CTR Program can be considered an epistemic community, how these experts emerged, operated, and influenced non-proliferation policy formulation. In the fourth section, the

(1975: 570, emphasis in original). In other words, epistemic communities create a discourse that creates and carries out standards of "normal" behaviour (Ruggie 1975: 570). By constructing social reality, Ruggie

limitations of the epistemic community approach and how they can be overcome are assessed.

2.1 The Epistemic Community Framework

The epistemic community framework was introduced to IR scholars by Haas in 1992 as a conceptual tool to explore global governance. It has been used to empirically study the role and impact of ideas in international relations and in international policy coordination, which can be conceptualised through three key themes identified from the existing literature. First, the key features of an epistemic community (including its composition); second, the uncertainty and complexity of the issue area, which prompt the emergence of an epistemic community; and third how it influences state decisions – i.e., how it creates the policies and subsequently influences their implementation as policy. These will be considered in turn below.

Key Features

According to Haas, an epistemic community is "a network of professionals with recognised expertise and competence in a particular domain and an authoritative claim to policy-relevant knowledge within that domain or issue area" (1992b: 3). They may consist of professionals from a variety of disciplines, but they usually have a shared set of principled beliefs, common causal beliefs, shared notions of validity, and a common policy enterprise (Haas 1992b).[34] Haas argues that these features distinguish members of an epistemic community from members of other groups often involved in policy

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maintains that political actors develop ideas and norms that underlie an issue area. Moreover, the actors are conscious of the construction of these ideas and norms.

[34] According to Haas, members of an epistemic community have "(1) a shared set of normative and principled beliefs, which provide a value-based rationale for the social action of community members; (2) shared causal beliefs, which are derived from their analysis of practices leading or contributing to a central set of problems in their domain and which then serve as the basis for elucidating the multiple linkages between possible policy actions and desired outcomes; (3) shared notions of validity – that is, intersubjective, internally defined criteria for weighing and validating knowledge in the domain of their expertise; and (4) a common policy enterprise – that is, a set of common practices associated with a set of

coordination.[35] According to Haas, the solidarity between the members of an epistemic community derives not only from their shared interests

> Which are based on cosmopolitan beliefs of promoting collective betterment but also from their shared aversions which are based on their reluctance to deal with policy agendas outside their common policy enterprise or invoke policies based on explanations that they do not accept (1992b: 20).[36]

Evidence from the existing epistemic community literature suggests that most commonly, and perhaps at a minimum, membership of epistemic communities consists of at least one group of scientific or technical experts with knowledge of and expertise in particular issue areas and of at least one group of relevant government officials (i.e., bureaucrats, diplomats, or administrators) who are responsible for making that policy within the issue area.[37] For example, Adler's (1992) nuclear arms control epistemic

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problems to which their professional competence is directed, presumably out of the conviction that human welfare will be enhanced as a consequence" (1992b: 3).

[35] In his introduction to the special issue of *International Organization* dedicated to the role of epistemic communities in international policy coordination, Haas outlines how to distinguish epistemic communities from other interest and/or knowledge-based groups and organisations, including advocacy coalitions, advocacy networks, think tanks, social movements, and bureaucratic agencies (1992: 16–20). He argues that epistemic communities differ from interest groups because epistemic community members have shared causal beliefs and cause-and-effect understandings. If members of an epistemic community were "confronted with anomalies that undermined their causal beliefs, they would withdraw from the policy debate, unlike interest groups" (Haas 1992b: 18). Haas also claims that epistemic communities need to be distinguished from the broader scientific community as well as from members of professions and disciplines since the ethics of an epistemic community stem from its principles and shared beliefs instead of a professional code. Members of any discipline or profession can "share a set of causal approaches or orientations and have a consensual knowledge base, but they lack the shared normative commitments of members of an epistemic community" (Haas 1992b: 19). Finally, Haas stresses that the beliefs and goals of epistemic communities differ from those of bureaucratic bodies. Even though epistemic communities and bureaucratic politics "share a focus on administrative empowerment of specialised knowledge groups" (Haas 1992b: 19), bureaucracies operate to preserve their budgets and agency mission, whereas epistemic communities apply their knowledge to a policy endeavour subject to their normative and causal beliefs. Dobusch and Quack (2008) provide a general overview on distinguishing between epistemic communities and social movements. They argue that the two groups differ in the pursuit of their goals. Epistemic communities influence political actors through facts and arguments – i.e., knowledge – whereas social/advocacy networks use pressure as the key component in their mobilisation strategy (Dobusch and Quack 2008: 11). For more on advocacy coalitions, see Sabatier 1998, Sabatier and Jenkins-Smith 1993. On think tanks, see Stone 1996, Stone et al. 1998; on advocacy networks, see Keck and Sikkink 1998; on social movements, see Touraine 1981, Tarrow 1994, Walker 1994, Diani 1998, Cohen and Rai 2000.

[36] In addition, Haas argues that the members' institutional ties, informal networks, and collective political activities also add to the persistence and solidarity of the community in several ways: "They provide members with a valuable institutional structure in which to compare information and to find moral support for their sometimes socially and politically marginalized beliefs. They also strengthen the commitments of individuals and inhibit them from subsequently recanting the beliefs shared with and reinforced by their fellow community members" (1992b: 20).

[37] It should be noted that in many cases the membership of these constituent groups overlap, as experts take positions in government, while government officials leave the government to work on the issue in the private sector.

community was comprised of physicists, nuclear scientists, economists, civilian strategists, and government officials; Hjorth's (1994) scientific-technological epistemic community was comprised of scientists, representatives from national governmental authorities and official research institutes; Haas' (1989) ecological epistemic community was comprised of ecologists, marine scientists, high-ranking officials from specialised agencies (such as the United Nations Environment Programme), government officials, engineers, physicists, oceanographers, and microbiologists; and Hopkins' (1992) food aid epistemic community was comprised of economic development specialists, agricultural economists, and government administrators.[38] These examples illustrate that epistemic communities comprising experts with expertise in niche issue areas and government officials are likely to influence policy formulation. This is because the scientific intricacies of complex issue areas such as nuclear disarmament, environmental protection, pollution reduction, and food aid security, require expertise in niche issue areas. In addition, members of these different epistemic communities included government officials, who afforded the epistemic community access to decision makers. Since epistemic community members are respected within their own disciplines, they have the ability to extend their influence – through their knowledge – to eventually reach major actors in the policy coordination process, culminating with decision makers.

Emergence

The increasingly complex and technical nature of the ever-widening range of issues on the international agenda confronts national policymakers with severe uncertainties (Haas

[38] Added to the examples presented here, the epistemic community literature also comprises analyses on an environmental scientist community (Haas 1989; 1992, Baark and Strahl 1995, Ringius 1997, Betsill and Pielke 1998, Lidskog and Sundqvist 2002, Sauvé and Watts 2003), a cetologist community (Peterson 1992), a Keynesian community (Ikenberry 1992), a financial regulators community (Kapstein 1992), a biological diversity community (Raustiala 1997), a conventional arms control community (Wright 1997), a central bankers/economic community (Verdun 1999, van Daele 2005), a critical loads community (Zito 2001a), a competition law community (van Waarden and Drahos 2002), an innovation and technology community (Sharif 2006), and a scientific epistemic community (Barth 2006).

1992b). Decision makers obliged to deal with issues of greater complexity rely increasingly on experts to "ameliorate the uncertainties and help them understand the current issues and anticipate future trends" (Haas 1992b: 12–13). As a result, the consensus view within the epistemic community literature has been that "under circumstances of complexity and uncertainty, governments will consult with expert communities in search of new ideas that make sense of the problem" (Drake and Nicolaïdis 1992: 41).[39] Within the epistemic community literature, "uncertainty" refers to periods when state decision makers are faced with an international agenda of complex and technical issues and they lack specialist knowledge in these issue areas.[40] Complexity refers to the nature of the issue areas, whether they are political, social, economic, or scientific. In past studies of epistemic communities, the nature of such issue areas have included security (Adler 1992, Mendelson 1993, Wright 1997), population (Drake and Nicolaïdis 1992), monetary/economic (Hopkins 1992, Verdun 1999, van Daele 2005), macroeconomic (Ikenberry 1992), plant genetics (Sauvé and Watts 2003), biodiversity (Raustiala 1997), innovation and technology (Sharif 2006), and environmental (Haas 1989; 1990; 1992c, Peterson 1992, Hjorth 1994, Baark and Strahl 1995, Ringius 1997, Betsill and Pielke 1998, Lidskog and Sundqvist 2002) issues.

New developments or unprecedented events – whether political, social, economic, or scientific – give rise to demands from decision makers for particular sorts of information. Meeting these demands can require considerable technical or scientific

[39] See also Haas 1989; 1990; 1992a, Mendelson 1993, Hjorth 1994, Baark and Strahl 1995, Liftin 1995, Radaelli 1995, Yee 1996, Raustiala 1997, Ringius 1997, Thomas 1997, Wright 1997, Betsill and Pielke 1998, Verdun 1999, Toke 1999, Zito 2001a, Simon 2002, Lidskog and Sundqvist 2002, van Waarden and Drahos 2002, Antoniades 2003, Sauvé and Watts 2003, Howorth 2004, Jacobs and Page 2005, van Daele 2005, Sharif 2005, Barth 2006, Trommer and Chari 2006, Mitchell et al. 2007, Dobusch and Quack 2008, Marier 2008, Dunlop 2010.

[40] It should be noted that in IR, uncertainty has multiple definitions, including fear, ignorance, and indeterminacy (Rathbun 2007: 536). Rathbun (2007: 536) argues that realists define uncertainty as fear (and prepare for possible conflict), rationalists define fear uncertainty as ignorance (and judge intentions of others), and constructivists define uncertainty as indeterminacy (and ascribe meaning). In this thesis, it is used in the context of (technical) unfamiliarity with niche issue areas (e.g., nuclear non-proliferation).

expertise. Epistemic communities are one possible provider of such information and advice because their

> Professional training, prestige, and reputation for expertise in an area highly valued by society or elite decision makers accord them access to the political system and legitimize or authorize their activities. Similarly, their claims to knowledge, supported by tests of validity, accord them influence over policy debates and serve as their primary social power resource (Haas 1992b: 17).

Further, while decision makers have access to vast amounts of information, the existing studies on epistemic communities have shown that policy-oriented knowledge from authoritative sources is a scarce resource. Epistemic communities, however, can provide numerous types of knowledge – including policy-oriented knowledge – to decision makers because they

> Can elucidate the cause-and-effect relationships and provide advice about the likely results of various courses of action; . . . [they] can shed light on the nature of the complex interlinkages between issues and the chain of events that might proceed from failure to take action or from instituting a particular policy; . . . [they] can help define the self-interests of a state or factions within it; . . . and [they] can help formulate policies, . . . including the introduction of policy alternatives, the selection of policies, and the building of national and international coalitions in support of the policies. (Haas 1992b: 15–16).

Therefore, as a source of knowledge, epistemic communities can provide information to decision makers on highly complex and uncertain issue areas.

It should be noted, however, that an epistemic community will not necessarily emerge in response to governmental demands for information. Instead, decision makers turn to a pre-existing, independent community. The pool of independent expertise on most subjects almost always exists and has the potential to become an epistemic community involved in influencing government decision makers, when decision makers solicit information. The different examples explored in the existing literature verify this claim. Issues such as the management of whaling (Peterson 1992), the long-term food security problems (Hopkins 1992) or the health of the Mediterranean Sea (Haas 1989) had been identified and discussed by technical and scientific experts *before* they became prominent to decision makers. In the example of the long-term food security problem,

the international food-aid epistemic community had been in existence for approximately 20 years before the issue of achieving food security worldwide became prominent to decision makers (Hopkins 1992). Based on these examples, it can be argued that epistemic communities already exist, but they become more active when decision makers solicit information, which often occurs in times of uncertainty. Uncertainty therefore provides an opening for an epistemic community to become involved in the policy process and a subsequent opportunity to influence decision makers. As Haas surmises, "without the help of experts, they [governments] risk making choices that not only ignore the interlinkages with other issues, but also highly discount the uncertain future" (1992b: 13).

Influence Mechanisms

Drawing on insights from the epistemic community literature, it can be argued that epistemic communities represent networks of knowledge-based experts who offer knowledge, ways of understanding intricate issue areas, and policy prescriptions to decision makers faced with complex problems. According to Haas, members of an epistemic community are "united by a belief in the truth of their model and by a commitment to translate this truth into public policy, in the conviction that human welfare will be enhanced as a result" (1990: 41). With their claims to authoritative knowledge, epistemic communities provide credible explanations of "truth" in different issue areas. Members of an epistemic community conduct scientific research in the context of the given "uncertain" issue area and translate their findings into advice for state decision makers, who in turn, use this information to formulate public policy. The question that subsequently arises is how do they exert their influence on decision makers and ultimately influence state decisions?

Adler and Haas argue that an epistemic community influences state decisions through the following four processes: policy innovation, policy diffusion, policy selection, and policy persistence (Adler and Haas 1992: 375–387). During policy innovation, members of an epistemic community decide the policy objectives and frame the issue (by relating it to state interests). This marks the first stages of exchanges between all members of the epistemic community. During policy diffusion, members of an epistemic community actively engage in information exchange and share ideas and policies on both a national and transnational level.[41] Once members of an epistemic community have framed an issue and diffused their ideas within the community, they recommend certain policy suggestions to decision makers, who then participate in policy selection. The epistemic community recommends the policies it thinks decision makers should select. An epistemic community facilitates policy selection through its ability to present policy alternatives as well as policy recommendations. Through their authoritative knowledge in highly technical and complex issue areas, members of an epistemic community influence and persuade decision makers to subscribe to particular policy recommendations. Policy persistence, in which the continuation of the consensus of ideas, beliefs, and goals over time among the epistemic community members contributes to their credibility and authority, can determine how long an epistemic community remains influential. (Please note that these influence mechanisms are discussed in greater detail later in the chapter as a way in which to conceptualise the nuclear non-proliferation epistemic community's influencing means.)

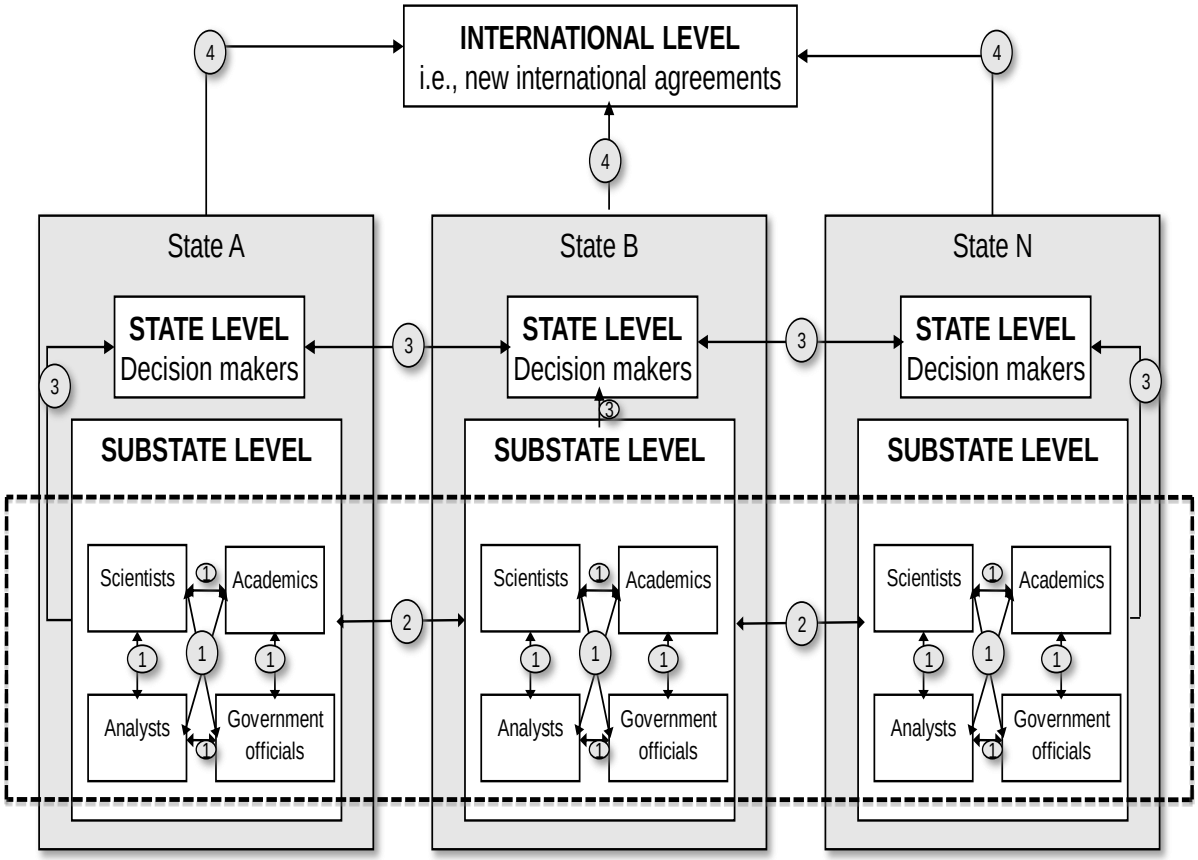
Based on my understanding and research on the epistemic community framework, Figure 2.1 puts forth one possible model illustrating how an epistemic community influences state decision makers. The different processes and exchanges an

[41] Diffusion refers to the "spread of expectations, values, and other types of ideas to other nations" (Adler 1992: 104). Transnational refers to the "interaction across national boundaries when at least one actor is a

epistemic community engages in which influences decision makers are denoted by (1) – (4) in the diagram, where (1) signifies policy innovation, (2) signifies policy diffusion, (3) signifies policy selection, and (4) signifies policy persistence. The dotted lines highlight the dual existence of an epistemic community acting on both a national and transnational level. Members of an epistemic community can be categorised into clusters of professions including scientists, academics, research analysts, and government officials. While there might be overlap across these clusters (e.g., a government official might have scientific training, a scientist might also be considered an academic, etc.), in this diagram, and indeed in my conceptualisation of epistemic community membership, "scientists" refers to those working in research laboratories, "academics" refers to those working in universities, "research analysts" refer to those working in think tanks and research institutes, and "government officials" refers to those working within a governmental bureaucratic institution (e.g., the Department of State, Department of Energy, Department of Defence, Foreign Ministries, etc).

non-state agent or does not operate on behalf of a national government or an intergovernmental organization" (Risse-Kappen 1995: 3).

Figure 2.1:
Epistemic Community at Work[42]



KEY:

1 = Policy Innovation
2 = Policy Diffusion
3 = Policy Selection
4 = Policy Persistence

[42] Please note that the State N model only applies to understanding international policy coordination. If studies wish to analyse domestic/national policy coordination, there would only need to be one state (State A) depicted in the model.

Although Adler and Haas provide a framework to illustrate the actual processes and interactions of how epistemic communities influence state decisions, it has been rarely applied to the existing studies on epistemic communities.[43] In fact, one of the very few studies that did exemplify the influence mechanisms framework was Adler's (1992) study of an arms control epistemic community. This epistemic community was significant in the emergence of nuclear arms control cooperation between the two superpowers at the height of the Cold War. Adler's case study provides evidence that a domestically developed idea created by a national group of experts (who, in this particular case, were chosen by the U.S. government to negotiate with the Soviets) resulted in the 1972 anti-ballistic missile (ABM) arms control treaty.[44] In the late 1960s/early 1970s, the U.S. government was confronted with the complex and uncertain technical issue of vertical nuclear weapons proliferation. As a result, it sought advice from its domestic arms control expert community, which, in turn, framed the issue of how to avoid nuclear war as a national interest. Members of the arms control epistemic community had expertise in understanding the consequences of a nuclear war, including nuclear fallout and radiation.[45] The idea of avoiding and understanding the consequences of nuclear war was subsequently diffused to fellow technical experts in both the U.S. and the Soviet Union, given the American epistemic community's transnational links. By the late 1960s and early 1970s, links had already been established amongst both the American and Soviet arms control community due to the emergence of the Pugwash Conferences on Science and World Affairs that had been working since 1955 to diminish the role of nuclear weapons in international politics.[46] Common interests between two

[43] The influence mechanism framework has only been applied by Adler (1992) and Verdun (1999).
[44] The ABM Treaty limits ABM systems used in defending areas against missile-delivered nuclear weapons.
[45] Nuclear fallout refers to the radioactive dust created when a nuclear weapon explodes.
[46] The Pugwash Conferences on Science and World Affairs, founded in 1957, is an international organisation that brings together international influential scholars – particularly scientists – and public figures concerned with reducing the danger of armed conflict and seeking cooperative solutions for global problems. Barth has argued that scientists from the Soviet Union and the U.S. developed contacts through

hostile powers were discovered and emerged as a basis for cooperation; both nations feared the threat of nuclear war, and feared the consequences of a nuclear war. American and Soviet experts relayed their fears of a nuclear war with their Cold War "enemy" to their respective state decision makers and provided policy recommendations, which included the framework of the ABM Treaty. Subsequently, because members of the epistemic community had access and ties to their respective state decision makers, the conclusion of the ABM Treaty could be realised.

2.2 The Importance of Knowledge and Scientific Expertise in Policy Formulation

An analysis of the epistemic community literature indicates that the role of knowledge and scientific expertise is arguably one of the most important factors in policy formulation (Haas 1992a).[47] It was explained earlier that the increasingly complex and technical nature of the ever-widening range of issues on the international agenda confronts national policymakers with severe uncertainties (Haas 1992b). Due to their expertise in policy-relevant issue areas, epistemic communities are one possible provider of clarifying and "making sense" of such uncertainties.

Issue uncertainty and complexity can arise from a number of different factors including problem complexity, unfamiliarity of the issue area, disagreements over problem definitions, measuring and gathering of evidence, and offered solutions to the problems (Zito 2001a). It can be argued that uncertainty make decision makers aware of

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Pugwash. Furthermore, he argues that these scientists subscribe to the epistemic community framework because they shared four core beliefs: (1) that scientists could move the international arms control agenda outside of official government-to-government contacts; (2) that a comprehensive nuclear test ban treaty was an important step towards more substantial arms control agreements; (3) that such a treaty could be adequately verified by seismic means; (4) that their partners from the other side of the Cold War divide shared the first three beliefs (2006: 184).

[47] While Haas' edited volume of International Organization is the seminal point of reference for research on epistemic communities, other works include: Haas 1989; 1990, Mendelson 1993, Hjorth 1994, Baark and Strahl 1995, Liftin 1995, Radaelli 1995, Raustiala 1997, Ringius 1997, Thomas 1997, Wright 1997, Betsill and Pielke 1998, Verdun 1999, Toke 1999, Zito 2001a, Simon 2002, Lidskog and Sundqvist 2002, van Waarden and Drahos 2002, Antoniades 2003, Sauvé and Watts 2003, Howorth 2004, Jacobs and Page 2005, van Daele 2005, Sharif 2006, Barth 2006, Trommer and Chari 2006, Mitchell et al. 2007, Dobusch and Quack 2008, Marier 2008, Dunlop 2010.

the limitations of their understanding of the issue area, and to the need of acquiring expertise. As a result, when decision makers are faced with uncertainty in niche issue areas – i.e., in highly technical and complex issue areas – demands for particular sorts of information arise. Members of an epistemic community with expertise in niche issue areas can meet these demands due to their extensive professional and practical experience in highly specialised technical issue areas.

As an example of how knowledge in a niche issue area leads to policy formulation, Raustiala analysed an epistemic community's role in securing the protection of global biological diversity (biodiversity) through the Convention on Biological Diversity (CBD). He writes,

> Biodiversity, like many environmental problems, is plagued by uncertainty. Uncertainty existed over the rate of biodiversity loss, its significance, and the proper policy response. Biologists do not know the order of magnitude of the number of species in existence, nor how rapidly they are disappearing. Nonetheless, there were many scientists very concerned with the rapid rate of habitat destruction—for which there was good evidence—and eager to see a stronger conservation regime in place. These concerns provided a scientific foundation for the emergence of the CBD (1997: 495).

Members of this epistemic community comprised scientists, as well as key individuals from government (including decision makers), and the biological industry. Due to their scientific knowledge and their ties to state decision makers, members of the epistemic community were instrumental in negotiating and creating the CBD. By providing a causal understanding and interpretation of the problem and a set of policy prescriptions, members of the epistemic community played an influential role – through their knowledge and expertise – in persuading all UN member states to sign the treaty, thereby institutionalising their ideas as an international policy.

Based on the above, it can be argued that the epistemic community framework is a useful approach to trace the origins of nuclear non-proliferation agreements because it provides an interesting structure with which analyse the role of non-proliferation experts – i.e., scientists and knowledgeable professionals – in nuclear policymaking. In the next

section, the nuclear non-proliferation epistemic community will be conceptualised through an application of the epistemic community framework described above.

2.3 Conceptualising the Nuclear Non-Proliferation Epistemic Community

By drawing on insights from the existing epistemic community literature in order to better understand to what extent the non-proliferation experts behind the creation of ABACC and the CTR Program can be considered an epistemic community, this section assesses who these experts are, and how they emerged, operated, and influenced non-proliferation policy formulation.

Nuclear Non-Proliferation Experts: An Epistemic Community?

In this thesis, I employ the concept of epistemic community to refer to professionals who come from a wide variety of disciplines and backgrounds.[48] While these professionals include technical and scientific experts, they are broader than one specific discipline or profession. In other words, they are not synonymous for one group of professional experts; they encompass a wide range of experts including academics working at universities, scientists working in laboratories, policy analysts working in think tanks and/or government, and government officials, as illustrated in Figure 2.1.

In line with the existing literature on epistemic communities, the experts involved in creating the policies behind ABACC and the CTR Program comprised "a network of professionals from a variety of disciplines and backgrounds" (Haas 1992b: 3). Each network comprised scientific/technical experts and government officials. These included representatives from national nuclear energy commissions, foreign policy analysts and academics, and officials charged with making nuclear policy.

Since my usage of epistemic communities follows Haas' definition, it is important

[48] Please note my usage of epistemic communities follows Haas' definition (1992b: 3) outlined earlier.

to reflect on how members of both non-proliferation epistemic communities shared the four conditions articulated by Haas (i.e., a shared set of normative and principled beliefs, causal beliefs, notions of validity, and a common policy enterprise). The existing epistemic community literature illustrates that the shared normative and principled beliefs and the common policy enterprise of the members of different epistemic communities were shared from the outset. They were articulated through frequent, informal contact between members of the community, and through discussions, arguments, and mutual criticisms that helped members of the community shape common concepts and create a common vocabulary (Haas 1989; 1992c, Adler 1992, Verdun 1999, Drake and Nicolaïdis 1992, Peterson 1992). Similarly, the shared causal beliefs members of the different epistemic communities explored in the literature were derived from their expertise in niche issue areas (Haas 1992a).[49] Regarding the shared notions of validity, most epistemic community studies indicate that these were based on scientifically proven tests (Haas 1992a).

In this study, it can be argued that the non-proliferation experts behind the creation of ABACC and the CTR Program comprised an epistemic community not only because of their authoritative claim to policy-relevant knowledge in a particular domain (nuclear weapons proliferation), but also because they shared the same set of normative, principled, and causal beliefs, notions of validity, and a common policy enterprise (to be discussed in further detail in Chapters Four–Seven). These shared conditions were articulated through frequent, informal contact between members of the community, which, in line with existing epistemic community studies, were gathered from interviews (with some members of the epistemic community) and verified by analysing publications, statements, testimonies, and other open-source documents.

[49] For example, Haas explained that the ecological epistemic community that initiated a banning of chlorofluorocarbons believed in preserving the quality of the environment. According to Haas, their causal

The Emergence of Nuclear Non-Proliferation Epistemic Communities

The theoretical framework of the epistemic community approach posits that when decision makers are faced with uncertainty and complexity (particularly regarding technical issues), they often demand particular sorts of scientific or technical information. Earlier, it was explained that epistemic communities are one possible provider of such information because they consist of experts who are capable of producing and providing this information due to their possession of policy-relevant knowledge (Haas 1992b). In the cases of ABACC and the CTR Program, both epistemic communities emerged during moments of uncertainty and complexity, albeit in different contexts. In the former case, Argentina and Brazil were uncertain about each other's unsafeguarded nuclear facilities.[50] In the latter case, the U.S. and the Soviet Union/Russia were uncertain about the command, control, and safety of 27,000 Soviet nuclear weapons after the dissolution of the Soviet Union in December 1991. With its dissolution, 15 new independent states emerged, including Russia, Belarus, Kazakhstan, and Ukraine – the states which inherited nuclear weapons.[51]

In the CTR Program case, unlike that of ABACC, decision makers did not solicit expertise. This empirical finding challenges the theoretical proposition that when decision makers are faced with an issue with which they are not familiar and in which they lack specialist knowledge, they will seek advice from an epistemic community (Haas 1992a). Instead, in the CTR Program case, the epistemic community offered its suggestions and advice to decision makers on how to assist the newly independent states

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beliefs was that the "chlorine in CFC emissions upsets the natural ozone balance by reacting with and breaking down ozone molecules and hence depleting the thin layer of stratospheric ozone" (1992c: 189).

[50] During the 1950s–1980s, both nations had indigenously developed some aspects of the nuclear fuel cycle and possessed nuclear facilities that were not subject to regional or international safeguards (discussed further in Chapters Four and Five).

[51] It should be noted that the U.S. and Russia were equally uncertain about the nuclear intentions of the successor states since Kazakhstan and Ukraine toyed with the idea of maintaining their inherited nuclear weapons. Of the three new independent nuclear states (excluding Russia), Belarus consistently maintained its desire to be nuclear weapons free, mainly due to the 1984 Chernobyl nuclear reactor accident (discussed further in Chapters Six and Seven).

with the elimination or reduction of their inherited nuclear weapons. Even though decision makers in one case did solicit scientific and technical expertise (in relation to the technical complexity surrounding mutual safeguards and inspections), and decision makers in the other case did not solicit scientific and technical expertise, in both cases, members of the epistemic communities used their expertise in a niche issue area to help craft the implemented nuclear non-proliferation cooperative agreements of ABACC and the CTR Program.

The Influence Mechanisms of Nuclear Non-Proliferation Epistemic Communities

As mentioned above, Adler and Haas argue that an epistemic community influences state decisions through the following four processes: policy innovation, policy diffusion, policy selection, and policy persistence (Adler and Haas 1992: 375–387), illustrated in Figure 2.1. In this study, it is argued that these influence mechanisms are facilitated by the members of the nuclear non-proliferation epistemic community's knowledge and access to decision makers, which are considered in relation to the four influence mechanisms below.

a) Policy Innovation

Policy innovation, denoted by (1) in Figure 2.1, marks the first stages of exchanges between all members of the epistemic community. Epistemic community analysis emphasises the ways in which "the carriers of ideas and expertise shape state interests and behaviour" (Raustiala 1997: 485). By being involved in the policy process from an early stage, an epistemic community can influence the way the policy process is conceived and the way in which the content of the roles of the actors involved is conceptualised (Antoniades 2003: 30–31). How decision makers respond to a problem often depends on the way the problem is framed (Allison and Zelikow 1998: 280). By identifying the nature of the issue area and framing the context in which new data and

ideas are interpreted, epistemic communities contribute to policy innovation by bounding the range of discourse and guiding decision makers in ways that clarify issues and resolve problems. Adler and Haas argue that through their participation in policy innovation, epistemic communities have a direct influence in the identification of national interests because of the reliance that decision makers unfamiliar with complex issues place on the ideas and knowledge of epistemic communities (1992: 375).

One of the greatest strengths of an epistemic community is its ability to frame the issue as a national interest due to members' expert knowledge of and expertise in a policy-relevant niche issue area. For example, by depicting the world in terms of an international market, members of a Keynesian epistemic community expressed the possibilities of mutual gains and the need for coordinated action in order to manage the post-war economic situation (Ikenberry 1992). Hopkins' study on the food aid regime provided evidence that the epistemic community promoted the use of food aid in order to alleviate long-term food security problems (Hopkins 1992). In Drake and Nicolaïdis' study on the regulation of trade in services, the epistemic community had a direct influence in the identification of national interests by characterising a set of international services as "trade" rather than a public monopoly (Drake and Nicolaïdis 1992). Adler analysed a U.S.-based epistemic community that framed the issue of superpower coordination around the theme of nuclear arms control, as previously described (Adler 1992). Finally, in his study of pollution control, Haas (1992c) examined how the ecological epistemic community was able to alter perceptions and frame the context for collective responses in dealing with environmental pollution. The ecological epistemic community was successful in altering perceptions because it used scientific data to support its claims that chlorofluorocarbons (CFCs) were damaging the ozone layer. In all these examples, through the community members' technical and scientific expertise in

niche areas, the issues were framed to coincide with the national interest and thus remain on the policy agenda, by relating it to the state's interest.

In line with the existing studies on epistemic communities, members from both the non-proliferation epistemic communities used their technical and scientific expertise to first raise awareness of the issue amongst decision makers, and second, help it remain on the policy agenda. The epistemic community behind the creation of ABACC used the issues of technological autonomy and the discriminatory nature of the international non-proliferation regime to frame Argentinean and Brazilian cooperative nuclear policy. Their shared opposition to a perceived discriminatory non-proliferation regime evolved into a common nuclear policy, which included regional confidence-building measures, and culminated in the establishment of a common mutual nuclear safeguards/bilateral inspections regime. Similarly, the epistemic community behind the creation of the CTR Program used the issues of international security and the threat of further nuclear weapons proliferation to frame the CTR Program.

b) Policy Diffusion

During policy diffusion, denoted by (2) in Figure 2.1, members of an epistemic community spread their ideas and engage in information exchange across and within disciplines nationally and transnationally. In other words, the clusters of groupings in the substate level in State A communicate with the clusters of groupings in the substate level in State B, State N, etc. By communicating with their colleagues in scientific bodies and other (international) organisations during conferences or via (joint) publications and other venues such as Track II meetings, symposia and specialist meetings (e.g., Pugwash meetings), members of an epistemic community share their ideas and policy innovations. Epistemic communities can be used as channels to circulate new ideas from societies to governments, as well as from country to country (Haas 1992a).

Studies have demonstrated that the diffusion of new ideas (promoted through an epistemic community) can be an integral part of international policy coordination (Ikenberry 1992, Adler 1992, Haas 1989, 1990, 1992c, Drake and Nicolaïdis 1992, Peterson 1992, Hopkins 1992, Baark and Strahl 1995, Ringius 1997, Betsill and Pielke 1998, Verdun 1999, Sharif 2006, Sauvé and Watts 2003, Dunlop 2010). Examples of diffusion described by the epistemic community literature include sharing and exchanging ideas between one country and another (Kapstein 1992, Adler 1992); exchanging ideas from a small number of key national actors to a much wider group eventually reaching the critical mass of governments required to undertake effective international coordination of policies (Haas 1992c, Adler 1992); and sharing a conceptual understanding (i.e., a shared idea) and creating a wide range of transnational links (Drake and Nicolaïdis 1992, Adler 1992). In both nuclear non-proliferation epistemic communities, members frequently participated in periodic meetings where they engaged in a mutual exchange of information, regular scientific, technical, and military consultative exchanges, and participated in discussions surrounding the nature of the mutual safeguards system (in the case of ABACC) and the nature of the technical and financial assistance programme (in the case of the CTR Program).

Through diffusion, the scope of the epistemic community's influence may extend to the transnational level since the spread of ideas and information can cross national boundaries "from community to government, and from country to country" (van Waarden and Drahos 2002: 929). This is because the transnational links allow members of an epistemic community to exert concurrent pressure on national decision makers to implement new international policies (Adler and Haas 1992: 378). The acceptance of

ideas (that are communicated and diffused by epistemic communities) by global partners can be used to concurrently pressure national governments to craft certain policies.[52]

Evidence from the existing epistemic community literature suggests that the more transnational its membership, the more an epistemic community can directly contribute to international policy convergence. For example, Haas (1990) demonstrated how an epistemic community made up of scientists and representatives from countries surrounding the Mediterranean Sea facilitated international cooperation to reduce pollution in the Mediterranean Sea. Members of the epistemic community participated in many acts of policy diffusion including information exchange, the provision of draft proposals, conference participation, and monitoring and publicising national activities which resulted in the creation of

> Transnational and transgovernmental coalitions of individuals and groups holding similar views in the Mediterranean countries. Such coalitions would engineer or guide simultaneous and congruent action by their governments by identifying possibilities for mutual benefit that had not been previously recognised or by developing entirely new policy objectives (1990: 56).

Further, Hopkins' (1992) study of the international food aid regime showed that an international epistemic community, comprised of members from major food donor states, played a major role in achieving food security worldwide. Through their relevant knowledge in a niche issue area (development economics, agricultural economics, food aid administration) conveyed through publications, speeches, and plenary government hearings, this epistemic community played an important role in fostering change in international food aid policy. Hjorth's (1994) study on Baltic Sea environmental cooperation demonstrated that the international environmental epistemic community involved had an influence on policy formulation and on the specification of measures through the diffusion of their ideas and policies, which contributed to the development

[52] This should not, however, suggest that members of an epistemic community cannot diffuse ideas and policies nationally.

of environmental cooperation amongst all Baltic Sea states. In these examples, since the epistemic community comprised members from many states, they were able to exert concurrent pressure on their respective national decision makers.

c) Policy Selection

Once members of an epistemic community have framed an issue and diffused their ideas within the community, they recommend certain policy suggestions to decision makers, who then participate in policy selection, denoted by (3) in Figure 2.1. However, as Adler and Haas argue, the extent of an epistemic community's role in policy selection depends on two factors: decision makers' unfamiliarity and uncertainty with policy issues, and the timing of policy choice (1992: 381–383). If there are no existing policies and decision makers are unfamiliar with an issue, decision makers are more likely to seek the assistance of an epistemic community. On the other hand, if decision makers are familiar with an issue, they may be less inclined to seek the advice of an epistemic community in policy selection. Even if national decision makers solicit the advice of an epistemic community to legitimise their policies, the epistemic community may be able to introduce ideas to the decision makers that influence policies later. If an epistemic community expresses ideas close to the political mainstream, it has a greater tendency to acquire influence than an epistemic community that expresses ideas further away from the mainstream (Adler 1992, Hopkins 1992, Haas 1992c, Kapstein 1992, Verdun 1999). In the example of the role of an epistemic community in the creation of the European Monetary Union (EMU), Verdun (1999) explained that members of the epistemic community (the Delors Committee) shared the same set of normative and principled beliefs as the European Council. Both the epistemic community and the European Council agreed that further economic and monetary integration would be beneficial to members of the European

Union. As a result, the policy behind the EMU was drafted by the epistemic community, and implemented by the European Union.

The second factor in assessing an epistemic community's role in policy selection depends on timing (Adler and Haas 1992: 383). The existing literature demonstrates that it was much easier for decision makers to accept the ideas from an epistemic community after political, military, or economic conditions have changed or a crisis has occurred. For example, strategic parity facilitated the political selection of arms control ideas in both the U.S. and the Soviet Union (Adler 1992). Equally, the discrediting of isolationist economic policies following their failure in the 1930s participated in the acceptance of the epistemic community's ideas embodied in the Bretton Woods agreement (Ikenberry 1992).

One of the original and key findings in this research is the role of a policy broker (i.e., a key "connector") in both cases that facilitated policy selection. In the ABACC case, the role of Argentina was especially important in terms of selecting the policy of mutual safeguards. Argentine representatives took on the role of policy "broker" in taking and leading the initiative on a cooperative and collaborative joint nuclear partnership – steps that led to the establishment of ABACC. In the CTR Program case, David Hamburg's role within the epistemic community as the key "connector" was instrumental, as he introduced the non-governmental experts to the government officials, thereby granting the experts access to decision makers.

d) Policy Persistence

Policy persistence, denoted by (4) in Figure 2.1, defines the creation of new international policies. During this phase, the continuation of consensus of ideas, beliefs, and goals over time among the epistemic community members contributes to their credibility and authority, can, as a result, determine how long an epistemic community remains

influential. Adler and Haas conclude, "new ideas and information, once institutionalised, can gain the status of orthodoxy" (1992: 384). In the area of arms control, for example, Adler remarked that the American- Soviet arms control epistemic community affected

> International political processes and outcomes by binding present and future decision makers to a set of concepts and meanings that amount to a new interpretation of reality (1992: 106).

Adler and Haas explain that the sources of collective learning in international relations can be found in the "evolutionary processes characterised by the diffusion, selection, and persistence of political innovations" (1992: 385). This suggests that national decision makers absorb new meanings and interpretations of reality – often generated by epistemic communities – and "therefore can change their interests and adjust their willingness to consider new courses of action" (1992: 385). Such learning entails more than the transmission and acquisition of information. It implies that decision makers should be amenable to accept new and innovative ways of resolving problems.

With regards to policy persistence, in both cases it came from the countries' leaderships. In the case of ABACC, policy persistence came from the two presidents who implemented the policy behind ABACC in July 1991, leading to its establishment in December 1991 and continued operation to this day. Soon after the creation of ABACC, Argentina and Brazil integrated into the non-proliferation regime, signing safeguard agreements with the IAEA and signing both the Treaty of Tlatelolco and the NPT. In the case of the CTR Program, policy persistence came from the U.S. Congress passing the Soviet Nuclear Threat Reduction Act of 1991. This act was subsequently signed into law by President George H. W. Bush on December 12, 1991, and over the following years came to be known as the Cooperative Threat Reduction Program, which is still in existence today.

As explained earlier, the epistemic community framework is a further model that explains patterns of cooperation and policy change in world politics. It analyses the impact of an epistemic community on states in international policy coordination and in international policy creation. Since an epistemic community can operate on a transnational level – which creates a venue for international policy coordination – more than one state at any given time is influenced to implement a policy. In fact, all existing studies on epistemic communities have emphasised the transnational component (Haas 1992a).[53] Notable examples of this include the food aid programme (Hopkins 1992) and the Med Plan (Haas 1990). In both examples, more than ten states were influenced to implement a policy because of the transnational component of the epistemic communities. The food aid programme and the Med Plan are examples of policy persistence because both initiatives became, and still are, existing international policies. As Hopkins surmised in his analysis of the food aid programme, "Once shifts in food aid practices and principles have occurred, they have been largely irreversible" (1992: 249).

Chapters Four–Seven will illustrate how both nuclear non-proliferation epistemic communities influenced government decision makers to implement their ideas as policy using Adler and Haas' influence mechanisms. In addition, these chapters will illustrate that these influence mechanisms were facilitated by the members of the nuclear non-proliferation epistemic community's knowledge and access to decision makers. Through their knowledge and expertise in the area of nuclear (non) proliferation, both epistemic communities raised decision makers' awareness and interest in the issue, which over time evolved into a policy-implemented non-proliferation cooperative agreement.

[53] In addition to Haas' edited volume of International Organization, further research on epistemic communities has been conducted (please refer to Footnote 47).

2.4 Limitations to the Epistemic Community Framework

Although the epistemic community framework has persuasively provided theoretically rich ways of conceptualising the process behind the creation of international policies, it has also attracted a number of criticisms. Inevitably, there are limitations that need to be taken into consideration when applying the epistemic community framework. The main criticism relates to the question surrounding the independent influence of epistemic communities (Sebenius 1992, Drake and Nicolaïdis 1992, Risse-Kappen 1994, Baark and Strahl 1995, Jacobsen 1995). In cases where epistemic communities were successful in influencing national decision makers to implement policies, membership of the epistemic community included decision makers. Since members of an epistemic community often occupy positions in niche advisory and regulatory bodies, they may have both direct and indirect ties to decision makers. When an epistemic community comprises representatives of government or international organisations or even decision makers themselves (as well as scientific/technical experts) – which is often the case – they are said to have direct ties to decision makers. Indirect ties, refers to members of the community not including decision makers but still having ties to them since the community is comprised of consultants, analysts, think tank researchers, from elite institutions which automatically grants them access to decision makers, allowing them to influence the policy process (Haas 1992a, Yee 1996, Antoniades 2003).[54] Examples of members of epistemic communities being directly (rather than indirectly) involved in the policy process are more common in the existing literature. Such examples demonstrate that without the inclusion of a government official/representative, the influence of an epistemic community is much more limited.

[54] It should be noted, that in some cases, epistemic community members were formerly part of government regulatory or advisory bodies (e.g., Environmental Protection Agency in the U.S.) thereby granting them access to decision makers.

A complex set of issues subsequently arises: if epistemic communities include government decision makers, how are epistemic communities independently influential in the policy process, especially since "the level of an epistemic community's influence depends on the extent of its access to top policymakers" (Drake and Nicolaïdis 1992: 41)? Further, it has been argued that epistemic communities can be effective only if their demands are "compatible with either a public opinion consensus … or the views of powerful players in Congress" (Risse-Kappen 1994: 211) and that "active political positioning, and not the mere content of the knowledge, creates the epistemic community's influence" (Zito 2001b: 467). Evidence from the existing literature confirms that epistemic communities with ties to high-ranking policymakers were able to influence decision makers (Adler 1992, Hopkins 1992, Hjorth 1994, Baark and Strahl 1995, Raustiala 1997, Ringius 1997, Betsill and Pielke 1998, Verdun 1999, Zito 2001a, van Waarden and Drahos 2002, Barth 2006). For example, Zito's (2001a) analysis of a critical loads epistemic community demonstrated that the community's membership was comprised of experts from Northern European countries with the active backing of Dutch and Scandinavian policymakers. As such, members of the epistemic community were able to persuade European politicians to focus on ecological sustainability. Raustiala's (1997) analysis of an epistemic community's involvement in the Convention of Biological Diversity demonstrated that by working with key individuals from the biological industry and government, the epistemic community helped to initiate an international regulatory cooperative agreement on biological diversity.

The response to such concern is that while membership of epistemic communities may comprise decision makers, it is important to note *when* decision makers join the community. Often, they become part of the epistemic community *after* the epistemic community has innovated the policies. Illustrating how and when epistemic community ideas get on the agenda and become viable alternatives is imperative. One

mechanism to illuminate influence would be to understand influence as "a causal relation between the preferences of an actor regarding an outcome and the outcome itself" (Nagel 1975: 29). The actor would be the epistemic community, and the outcome, the implemented policy suggested by the epistemic community. Haas (1992b) maintains that in order to demonstrate epistemic community influence on decision makers, tracing the epistemic community's activities at various points in time is to be encouraged. In other words, tracing the lifetime of the implemented policy starting with *when* the idea was conceived and ending with *when* it became policy. In the cases explored in this thesis, while government officials comprised both non-proliferation epistemic communities, they did not get involved in the community until *after* the idea behind both non-proliferation cooperative agreements had been conceived by the technical and scientific experts. In the case of ABACC, scientists had been engaging in the idea of a mutual inspections regime in the early 1980s, and over the subsequent years, decision makers warmed to this idea, leading to the institutionalisation of ABACC. In the case of the CTR Program, the non-governmental experts had been working on how to cope with the aftermath of a dissolving Soviet Union from August 1991, prior to the government officials' involvement in the drafting of the CTR legislation.

It is clear that operationalising "influence" is a key component of epistemic community framework analysis. In her study of the changes in Soviet foreign policy during the late 1980s that led to the end of the Cold War and the Soviet withdrawal from Afghanistan, Mendelson (1993) develops a framework that determines the influence of epistemic community members on policy. She uses "advice" as a means of measuring influence, separating it into two component elements: its *scope* and its *quality* (1993: 340–341). The *scope* of advice refers to issue content: the types of issues experts are called upon to analyse, the type of technical capabilities the experts have, and to whom the experts are giving their analyses. The *quality* of advice has three elements: timing, the

function of the experts, and the access channels. Timing refers to the stage in the decision-making process the experts' advice is sought: "Is advice provided before the "preliminary" decision or the "final" decision?" (Mendelson 1993: 341). The function of the experts (which relates to timing) relates to the purpose for which advice is sought: "Are specialists initiating ideas or just mobilizing opinion?" (Mendelson 1993: 341). The access channels refer to who has more access to whom, and why? In order to fully appreciate the role of an epistemic community in the policy process, following Mendelson's framework might overcome criticisms of "the epistemic community approach is a model of elites by elites and for elites" (Jacobsen 1995: 303).

A third criticism surrounds the difficulty in finding a community of experts who sufficiently fulfil Haas's definitions and characteristics of epistemic communities (Sebenius 1992, Ikenberry 1992, Kapstein 1992, Radaelli 1995, Wright 1997). However, evidence from all of the epistemic communities identified in the existing literature persuasively illustrated that epistemic communities comprised scientists or technical experts and bureaucrats who shared normative, principled, and causal beliefs and a common policy project. Further, Haas maintains that identifying the beliefs of an epistemic community calls for "a detailed study of materials such as the early publications of community members, testimonies before legislative bodies, speeches, biographical accounts, and interviews" (1992b: 35) before epistemic community members become involved in the policymaking process.

A further criticism of the epistemic community framework is that it assigns too much influence to experts at the expense of other actors (Toke 1999, Dunlop 2000, Jacobs and Page 2005). Critics argue that the epistemic community framework fails to take into account the multitude of actors, including interest groups and social movements, who, at various times, shape the norms of decision makers (Toke 1999, Dunlop 2000). Further, even if epistemic communities are important in the policy

process, they may not be the most influential group involved. Jacobs and Page (2005) find epistemic communities are not as influential in American foreign policymaking as other organisations are. The response to such criticism is that while the framework may not take into account simultaneous influence mechanisms, the method of process tracing allows the researcher to trace the epistemic community's activities and demonstrate its influence on decision makers at various points in time. This will allow "identifying alternative credible outcomes that were foreclosed as a result of their influence, and exploring alternative explanations for the actions of decision makers" (Haas 1992b: 34).

A final criticism of the framework questions the connection between scientific knowledge and power (Litfin 1995, Finnemore 1994, Lidskog and Sundqvist 2002). Critics argue that the epistemic community framework does not explain what it is about scientific and specialised knowledge that makes the role of an epistemic community so powerful. Further, they question the claim that scientific/specialised knowledge is the main producer of convergent state policies. The response to such criticism is that knowledge alone might not be as powerful or as effective in influencing national decision makers as knowledge *and* access to decision makers. Through both its specialist knowledge and its ability to penetrate the government or relevant executive body, which it does through its access and ties to both policymakers and decision makers, an epistemic community is likely to have a direct impact on setting the agenda and on subsequent policy negotiations.

2.5 Conclusion

Research on epistemic communities has shown that the increasing complexity and uncertainty of global problems has led decision makers to turn to new and different channels of advice, specifically to networks of knowledge-based experts from academia, think tanks, scientific institutions, national bureaucracies, and other places of

technical/issue-specific expertise. These experts – who often comprise epistemic communities – are able to ascertain the causes of international problems, the interests of states affected by those problems, and offer policy recommendations, policy alternatives, and likely solutions. In providing interpretations and solutions, members of the epistemic community become involved in states' decision-making processes. While epistemic communities help shape state preferences through the knowledge they possess, they can exert influence through the institutionalisation of their ideas on decision makers. It can therefore be argued that knowledge – coupled with access to decision makers – plays an important and decisive role in influencing state decisions and subsequently shaping state behaviour. The basis of an epistemic community – its membership and its source of authority – revolves around members' expertise and technical knowledge. From uncertainty to international policy coordination, members of an epistemic community use their authoritative claim to policy-relevant knowledge in a particular domain to influence state decisions.

The theoretical framework discussed in this chapter indicates that it is possible to outline two principal ways through which epistemic communities may be understood to be influential in international policy creation. These are the importance of epistemic community members having knowledge and expertise in niche issue areas (e.g., in highly technical and complex issue areas), and access to decision makers. Since the most meaningful insights into the role of epistemic communities will emerge through empirical investigation, the task of determining the importance of these two components are left to Chapters Four–Seven. In the following chapter, the research approach applied in this thesis is introduced.

Chapter Three

Research Approach:
Utilising Case Studies to Explain the Role of Epistemic Communities in Nuclear Non-Proliferation Policy Formulation

Having presented the analytical framework, this chapter introduces the research approach used in this study in order to empirically investigate the role of epistemic communities in nuclear non-proliferation policy formulation. It should be premised that the main aim of this thesis is to apply the epistemic community framework to two under-studied cases of nuclear non-proliferation agreements: the Brazilian-Argentine Agency for Accounting and Control of Nuclear Materials (ABACC) and the Nunn-Lugar Cooperative Threat Reduction (CTR) Program. Using the epistemic community framework as an analytical tool, this thesis aims to trace the origins of the two agreements. The main research question this thesis aims to answer is: To what extent did an epistemic community influence the creation of ABACC and the CTR Program?

The chapter is structured in four parts. First, it begins by discussing the analytical framework of epistemic communities in relation to nuclear non-proliferation. Second, it explains the research approach used in this study, principally the *case study method* and *process-tracing*. Third, it presents in greater detail the logic of the case selection. Fourth, it outlines the methods used for both data collection and analysis.

3.1 Epistemic Communities and Nuclear Non-Proliferation

The existing non-proliferation explanations – extended deterrence, the nuclear non-proliferation regime (specifically the NPT), the non-proliferation norm, and democratisation – provide convincing arguments that explain the large gap between the number of actual nuclear weapon states in relation to the number of capable nuclear

weapon states (see Figure 1.1, p. 4).[55] However, as indicated in Chapter One, empirical evidence suggests that these explanations are not fully sufficient in understanding every case of nuclear non-proliferation adequately.[56] Therefore, in order to gain a more complete understanding of non-proliferation outcomes and to supplement existing arguments, there is a need to broaden explanations. Since little attention has been given to the role of non-proliferation experts (e.g., scientists, academics, and research analysts) within the existing non-proliferation explanations, this thesis applies the epistemic community framework as a way in which to consider the role of these experts in the non-proliferation outcomes of the empirical anomalies.[57]

The epistemic community approach is a useful avenue for broadening existing non-proliferation explanations to include more actors (including these experts) as key in understanding non-proliferation outcomes because it focuses on the role of a community of experts behind policy formulation (and subsequent implementation). Consequently, it provides a crucial insight into the link between actors and nuclear non-proliferation policy. This thesis therefore examines the role of an epistemic community in nuclear non-proliferation policy formulation. It assesses the importance of an epistemic community in the process behind the non-proliferation outcome of two different sets of the empirical anomalies by focusing on its role behind the creation of two non-proliferation agreements: ABACC, which verified Argentina and Brazil's non nuclear weapon status, and the CTR Program, which facilitated the denuclearisation of Belarus, Kazakhstan, and Ukraine. The process of where and from whom the ideas behind ABACC and the CTR Program came from is currently lacking within the existing

[55] Figure 1.1 illustrates the potential versus actual nuclear weapons proliferation from 1945 to the present day. It shows that over the years, there were approximately 45 nuclear weapon capable states in relation to nine actual nuclear weapon states.
[56] Please note that these explanations were discussed in greater detail in Chapter One.
[57] My usage of epistemic communities follows Haas' definition of a "network of professionals with recognised expertise and competence in a particular domain and an authoritative claim to policy-relevant knowledge within that domain or issue area" (1992b: 3).

literature. As such, the epistemic community framework provides an interesting and useful framework with which to analyse and trace the origins of both these nuclear non-proliferation agreements.

However, it should be noted that the epistemic community framework is not being used as an alternative non-proliferation explanation per se, but rather as an intervening mechanism in the non-proliferation process. In other words, this research examines the explanatory effect of an epistemic community in the non-proliferation policy process; the epistemic community framework is being used to trace the emergence of a particular non-proliferation agreement (e.g., ABACC and the CTR Program) that is necessary for understanding the eventual outcome of non-proliferation in the empirical anomalies. Therefore, the main focus of this research is to examine the role of a nuclear non-proliferation epistemic community in the creation of ABACC and the CTR Program. The main premise of this research is that epistemic communities have played a significant yet under-appreciated role in explaining the process behind Argentina, Brazil, Belarus, Kazakhstan and Ukraine's eventual non-proliferation outcome.

3.2 Research Approach

In order to examine the role of a nuclear non-proliferation epistemic community behind the creation (and subsequent implementation) of ABACC and the CTR Program, this thesis uses a case study research design to produce an analytical narrative behind both cases and process tracing to trace (and, by extension, demonstrate) the influence mechanisms of the epistemic community over time.

The Case Study Method

This thesis provides an in-depth empirical analysis of two explanatory case studies.[58] The case study method entails an analytical narrative, paying close attention to a detailed investigation of events. The analytical narrative is motivated by a desire for an explanation of particular events or outcomes, rather than the elaboration of theory (Bates et al. 1998: 11). Since this thesis is exploring and examining the role of epistemic communities behind the creation of two nuclear non-proliferation agreements, an analytical narrative behind the two case studies explored in this thesis is constructed that explains how and why ABACC and the CTR Program were created. Yin remarks that "how" and "why" questions are more appropriately addressed through the case study method since such questions deal with operational links which need to be traced over time, rather than with "mere frequencies or incidences" (2003: 1). In addition, case study researchers are interested in finding the conditions under which specified outcomes occur and the mechanisms through which they occur (George and Bennett 2005: 31).

Inevitably, there are limitations that need to be taken into consideration when relying on the case study method. The main criticism relates to the generalisability of the findings which emerge from the analysis of the case studies examined (Flyvbjerg 2006, Yin 2003, George and Bennett 2005). While one cannot generalise findings to a wider universe of cases on the basis of an individual case, this does not preclude its applicability to future cases where similar variables exist. At the very minimum, the process tracing in the case study research (discussed below) can identify patterns and processes that may at least potentially be generalisable to many other cases. For example, further empirical research on non-proliferation agreements can refine our understanding of the role of

[58] The explanatory method uses theory to explain the causes and patterns of historical cases (van Evera 1997: 92).

expertise and epistemic communities in non-proliferation and allow us to see how generalisable they are across other cases.

Process-Tracing

Process-tracing, which offers the possibility to uncover the steps by which causes affect outcomes, is a suitable method to execute case studies (George and Bennett 2005, Checkel 2006). Tarrow notes that the goal of process-tracing is to "connect the phases of the policy process and enable the investigator to identify the reasons for the emergence of a particular decision through the dynamic of events" (1995: 472). Haas (1992b) maintains that in order to demonstrate epistemic community influence on decision makers, tracing the epistemic community's activities at various points in time is to be encouraged. Since this thesis is interested in exploring the role of epistemic communities behind the creation of nuclear non-proliferation agreements, it uses process tracing to trace the lifetime of the implemented policy (ABACC and the CTR Program) by starting with *when* the idea was conceived (and by whom) and ending with *when* it became implemented policy.

When using the process-tracing method, researchers are encouraged to take equifinality – that is, the consideration of alternative paths through which the outcome could have occurred – into account (George and Bennet 2005: 222). In this study, while the emphasis is on an examination of the role of an epistemic community behind the creation of non-proliferation agreements, it does appreciate that other factors (e.g., transition to democracy, economic liberalism, and international factors, including the role of the U.S.) were also at play. Therefore, it does not discount the other causal factors that led to the countries' decisions not to proliferate, but it focuses on the role of an epistemic community in influencing the creation of non-proliferation policies in the non-proliferation process.

3.3 Case Study Selection

The cases selected for this study are two cooperative nuclear non-proliferation agreements: ABACC and the CTR Program. While it might appear that there is a difference between the two agreements given that Argentina and Brazil never became nuclear weapon states, whereas Belarus, Kazakhstan, and Ukraine relinquished their inherited nuclear weapons, it should be noted that both cases are examples of cooperative non-proliferation agreements. In Chapter One, the term non-proliferation was defined as preventing an increase in the number of countries possessing nuclear weapons. As such, the two cases present two different conceptualisations of non-proliferation: on the one hand, an agreement that verified the non-nuclear weapon states of two countries that did not pursue a nuclear weapons programme in spite of their capability and widespread suspicion (e.g., Argentina and Brazil), and on the other hand, an agreement that facilitated the denuclearisation of three countries that inherited nuclear weapons, but decided to relinquish them (e.g., Belarus, Kazakhstan, and Ukraine).

ABACC and the CTR Program are two examples of many cooperative nuclear non-proliferation agreements. Other notable examples include the NPT, nuclear weapon free zones (e.g., the Antarctic Treaty, the Tlatelolco Treaty, the Rarotonga Treaty, the Bangkok Treaty, the Pelindaba Treaty, the Semi-Palatinsk Treaty), the Agreed Framework (signed between the U.S. and North Korea in 1994), the Anti-Ballistic Missile (ABM) Treaty, the Fissile Material Cut-Off (FMCT) Treaty, the Intermediate-Range Nuclear Forces (INF) Treaty, the Nuclear Suppliers Group (NSG), and the Strategic Arms Reduction (START) Treaty I, II, and III. ABACC and the CTR Program were selected for this study for two reasons. First, an analysis into the creation and implementation of nuclear non-proliferation agreements is an under explored area within the international security field. With the exception of Adler's (1992) study on a nuclear arms control epistemic community that led to the creation and subsequent

implementation of the ABM Treaty, very little research has been conducted on the roles of epistemic communities in creating international security policies. By focusing on ABACC and the CTR Program, this study will add to the relatively under explored area of analysing how two nuclear non-proliferation agreements facilitated non-proliferation in the respective countries. Through an examination of the origins behind these agreements, this study can shed light on the applicability of the epistemic community framework to nuclear non-proliferation policymaking.

A second reason for focusing on ABACC and the CTR Program is to supplement the existing explanations behind Argentina, Brazil, Belarus, Kazakhstan, and Ukraine's non-proliferation. In Chapter One, it was explained how and why the dominant non-proliferation explanations are not fully sufficient in understanding Argentina and Brazil's non-proliferation and Belarus, Kazakhstan, and Ukraine's denuclearisation. In applying the epistemic community framework, this study seeks to broaden existing non-proliferation explanations by focusing on the role of experts in formulating the two agreements that facilitated the non-proliferation outcomes. Since the existing literature lacks an analysis of how and from whom the policies behind ABACC and the CTR Program were created, this thesis investigates the process of how and why these agreements materialised and aided the non-proliferation process. The analysis of both cases suggests that considering the role played by epistemic communities in these cases broadens our understanding of the non-proliferation outcome. Furthermore, the analysis suggests that applying an epistemic community approach provides explanatory power heretofore lacking in explanations of these countries' non-proliferation outcomes.

ABACC

The main objective of this case study analysis is to examine to what extent an Argentine and Brazilian nuclear non-proliferation epistemic community was influential in the creation of the mutual safeguards inspection systems policy, which led to the implementation of ABACC in 1991. It focuses particularly on the period 1980–1991; May 1980 marked the first nuclear cooperation agreement between Brazil and Argentina on the development and application of the peaceful uses of nuclear energy; and in July 1991, Presidents Carlos Menem of Argentina and Fernando Collor of Brazil signed the Guadalajara Agreement, which created ABACC. ABACC is one of the most important factors in Argentina and Brazil's non-proliferation outcome since it established joint mutual inspections of both countries' nuclear facilities, which ultimately verified their non-nuclear weapon status.

To date, no academic research has analysed the role of nuclear non-proliferation experts behind the policy which led to the creation of ABACC. There has, however, been some research conducted on the role of an epistemic community and of ideas in the Argentina-Brazil rapprochement, although none of these studies focus on the causal link between the epistemic community and the creation of ABACC (Barletta 2000, Alcañiz 2004, Fabbri 2005). Barletta's (2000) thesis analyses how shared ideas shape political behaviour and how political actors build proliferation coalitions and attribute meaning to atomic energy from 1945–1994. Alcañiz's (2004) thesis argues that the Argentina and Brazil integration process was brought about by a group of Argentine and Brazilian nuclear professionals from 1985–1991, but no information is provided on who these professionals were, how they influenced the integration process, and how they emerged. Fabbri's (2005) thesis provides an analytical framework for approaching the study of ideas and investigates the role of ideas and institutions in the Argentina–Brazil rapprochement of the 1980s from 1979–1991. While these are welcome theses in the

relatively underexplored case of Argentina and Brazil's non-nuclearisation, none of them explain three important and underexplored factors within the Argentina and Brazil nuclear story, which this thesis explores. First, how the epistemic community emerged; second, who comprised the epistemic community; and third, how the epistemic community influenced the creation of ABACC and were able to influence its subsequent implementation as policy.

In this case study analysis, the empirical evidence suggests that the Argentine and Brazilian desire to pursue technological autonomy, coupled with their perceived discriminatory nature of the international nuclear non-proliferation regime, created a shared sentiment between the two states, which enabled the former rivals to establish a nuclear partnership.[59] The criticisms against the non-proliferation regime espoused by both Argentine and Brazilian diplomats in international non-proliferation and disarmament fora throughout the 1960s and 1970s forged the emergence of a transnational network of experts with shared beliefs. At the same time, scientists from both states engaged in joint research and technical projects. Throughout this period, Argentines and Brazilians both noticed that, in spite of their rivalry, they were reaching common ground in nuclear issues, especially regarding energy policy, non-proliferation, and nuclear disarmament. A common front against a common enemy (i.e., the non-proliferation regime) began to emerge, heralding the beginnings of a nuclear relationship, culminating in the 1980 agreement. During the 1980–1991 period, the evidence in this case study analysis suggests that members of the epistemic community used their knowledge and expertise in nuclear issues, coupled with their access to decision makers, to influence the creation of the policy, which led to ABACC.

[59] Throughout the 1970s and 1980s, Argentina and Brazil resisted against the international nuclear non-proliferation regime, particularly against the NPT, which they viewed as discriminatory. Chapter Four provides further detail on the two states' hostility towards the nuclear non-proliferation regime.

The analysis of this case study proceeds in two chapters. In the first chapter (Chapter Four), a historical overview of Argentina and Brazil's suspected nuclear weapons programmes from the mid 1960s is provided. In addition, the emergence of an Argentine-Brazilian nuclear non-proliferation epistemic community is analysed. In the second chapter (Chapter Five), the process of how Argentine and Brazilian non-proliferation experts created the policy behind the mutual safeguards inspection regime (i.e., ABACC) and were able to influence its subsequent implementation as policy is analysed.

The CTR Program

The main objective of this case study analysis is to examine to what extent a U.S.-Soviet/Russian nuclear non-proliferation epistemic community was influential in the creation of the policy which led to the CTR Program. It provides a historical overview relating to the genesis of the CTR Program by focusing on the period 1991–1996. In December 1991, the Soviet Union collapsed, resulting in the emergence of 15 new successor states, including Belarus, Kazakhstan, and Ukraine who collectively inherited approximately 6,350 nuclear weapons (Norris 1992: 25). By November 1996, through the CTR Program, all three states had denuclearised and had become non-nuclear weapon states. The CTR Program was a very important factor in the denuclearisation of Belarus, Kazakhstan, and Ukraine because, *inter alia*, it provided financial and technical assistance to safely dismantle the inherited nuclear weapons. Consequently, in this case study, the importance of the CTR Program in relation to the denuclearisation of the three states is analysed.

Similar to the case of ABACC, to date, no academic research has analysed the role of a nuclear non-proliferation epistemic community in the creation of the CTR Program. Few studies have, however, provided some background on the origins of the

CTR Program, although they do not focus on the causal link between the epistemic community and the creation of the CTR Program (Combs 1997, Nunn 1997, Carter and Perry 1999, Lugar 1999; 2001; 2005; 2008, Ellis 2001, Carter 2005, Bernstein and Wood 2010). Moreover, none of the studies explain three important and underexplored factors behind the creation of the CTR Program, which this thesis explores. First, how the epistemic community emerged; second, who comprised the epistemic community; and third, how the epistemic community created the CTR Program and were able to influence its subsequent implementation as policy, facilitating the denuclearisation of the three states.

In this case study analysis, the empirical evidence suggests that after the failed 20/21 August 1991 coup d'état against Soviet President Mikhail Gorbachev – four months prior to the dissolution of the Soviet Union – U.S. and Soviet non-proliferation experts (including academics, research analysts, and government officials) began to anticipate the unprecedented security threat of the possible overnight creation of four more nuclear weapon states (including Russia). Together, these experts began discussing ways in which the U.S. could manage and finance the dismantling of the newly created republics' nuclear arsenals. They understood that immediate action was needed in order to establish a "cooperative threat reduction" programme. Such a programme would entail a cooperative threat reduction and disarmament effort that would reduce the global threat from weapons of mass destruction held in the former Soviet Union. Their vision was to move U.S. nuclear policy from one of deterrence and mutually assured destruction with the Soviet Union to a coordinated non-proliferation policy of international cooperation with the new states of Russia, Belarus, Kazakhstan, and Ukraine (Felton 2002: 4, Aspin 1991b: 10). During the latter months of 1991, the evidence in this case study analysis suggests that members of the epistemic community used their knowledge and expertise in nuclear issues, coupled with their access to

decision makers, to influence the creation of the policy, which led to the CTR Program. After the Soviet Nuclear Threat Reduction Act of 1991 (the original CTR Program legislation) was signed into U.S. law in December 1991 by President George H. W. Bush, the empirical evidence in this case study analysis suggests that over the next five years, the denuclearisation of the three states was made possible under the auspices of the CTR Program.

The analysis of this case study proceeds in two chapters. In the first chapter (Chapter Six), the scope of Belarus, Kazakhstan, and Ukraine's nuclear inheritance is analysed. Having understood the U.S. and Soviet/Russian fear of the prospect of living with three further nuclear weapon states, the chapter then analyses how the U.S.-Soviet/Russian nuclear non-proliferation epistemic community emerged. In the second chapter (Chapter Seven), the process of American and Soviet/Russian non-proliferation experts created the CTR Program and were able to influence its subsequent implementation as policy is analysed. In addition, the importance of the CTR Program in relation to the denuclearisation of Belarus, Kazakhstan, and Ukraine is discussed.

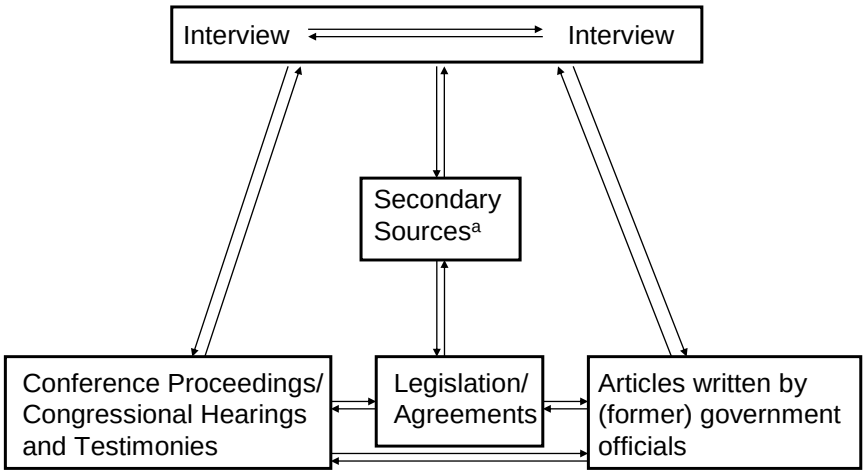
3.4 Data Collection and Analysis

The methodology used in this study fits with the existing empirical research conducted on epistemic communities in that case studies are used and that data collection consisted of interviews with some members from both epistemic communities and an analysis of community members' publications (Haas 1992a).[60] These interviews and analysis of their publications were very useful in understanding the role played by both epistemic communities in nuclear non-proliferation policy formulation. It should be noted, however, that the data collected was gathered not only through interviews and

[60] These included a detailed study of materials which comprised the early publications of community members, testimonies before legislative bodies, speeches, biographical accounts, and interviews, as suggested by Haas (1992b: 35).

publication analysis, but through an application of the triangulation technique, a strategy to cross-check findings and verify the events and behaviours under investigation by using a combination of primary and secondary sources, illustrated in Figure 3.1. (Davies 2001: 73, Burns 2000: 390).

Figure 3.1:
Triangulation Sources[61]



a = newspaper articles; websites (such as www.abacc.org); scholarly/policy articles/books

The arrows in Figure 3.1 illustrate the way in which the data collected for this study was reconciled. For example, by starting with secondary sources (e.g., newspaper articles and scholarly/policy articles and books), the general overview of both cases was determined and the experts behind the policies were identified. Then, through the elite interviews conducted with government officials, academics, and scientists (some of whom comprised the epistemic community), further data was provided. (It should also be noted that interviews were done via snowballing sampling.) This data was then corroborated through an analysis of secondary sources and other primary sources

[61] This diagram was taken from Davies 2001: 78 and was modified to fit the data collection undertaken in this study.

consulted including conference proceedings, congressional hearings, articles from government officials, and official statements from government officials, including texts of agreements and policies. Therefore, the data collection and analysis used for this study proceeded in two stages: background research and original research, which are considered in turn below.

Background Research

First, a great deal of background research was conducted to determine the general narrative of the case, including an understanding of who comprised the nuclear non-proliferation epistemic community in both case studies. While fewer publications (both academic and policy) on ABACC and the CTR Program exist, there are many studies available on Argentina and Brazil's nuclear weapons aspirations and Belarus, Kazakhstan, and Ukraine's inherited nuclear weapon status. In addition, other readily available sources (e.g., newspaper articles) were consulted which helped to provide an overview of the cases. Newspaper articles from *The Financial Times*, *The New York Times*, and *The Washington Post* were consulted for both cases: from May 1980 – December 1991 for the ABACC case; and from August 1991 – December 1996 for the CTR Program.[62] These publications were essential in examining the general outline and in determining, to some extent, who comprised the nuclear non-proliferation epistemic community in both case studies analysed in this study.

Original Research

Second, extensive original research was conducted to determine the role played by the epistemic community in both cases. These included elite interviews with individuals who comprised the nuclear non-proliferation epistemic community in the two cases,

[62] These broadsheet newspapers were selected because they are widely accepted as English-language authoritative news sources.

conference proceedings, congressional hearings, journal articles from government officials (including op-eds written by former Argentine, Brazilian, U.S., Russian, Belarusian, Kazakh, and Ukrainian government officials from specific non-proliferation journals including *Bulletin of the Atomic Scientists*, *Arms Control Today*, and *The Nonproliferation Review*), and official documents (e.g., texts of joint declarations, legislation, etc.).

The elite interviews for this study were conducted to better understand when, why, and from whom the ideas behind both policies were realised, how the experts knew one another, how often experts within the community met with one another on both a national and transnational level, and what access channels existed between the experts and state decision makers. These interviews helped establish to what extent the epistemic community influenced two principal points of investigation under study: first, the creation of the policies under review; and second, the influence on state decision makers to implement the policies they had crafted. All interviews conducted for this thesis were of a "semistandardised" format, as there was "the implementation of a number of predetermined questions and special topics" (Berg 2007: 95), but the interviews were not restricted to these questions alone. Furthermore, interviewees were allowed "freedom to digress", which permits the interviewer to "probe far beyond the answers" to the predetermined questions (Berg 2007: 95).[63]

Interviews were conducted with knowledgeable academics, policymakers, scientists, and government officials (including diplomats) in Austria, Argentina, Brazil, Russia, Sweden, UK, and the U.S. (face-to-face, over the phone, via email) from June 2008 to October 2009. For the ABACC case, a total of 18 interviews were conducted, and for the CTR Program case, a total of 27 interviews were conducted.[64] All interviews were conducted in English, apart from one, which was conducted in Spanish.[65] Most

[63] Interview questions are provided in Appendix I.
[64] Details of interview collection are provided in Appendix II.
[65] This interview was conducted by a native Spanish speaker (Coromoto Power Febres).

interviews lasted about one hour, although they ranged from half an hour to four and a half hours in length. Due to the sensitivity of the subject being discussed, none of the interviews were recorded, with most interview subjects requesting confidentiality. Instead, detailed notes were taken throughout the interview.

While elite interviewing has some limitations, there are also many benefits to consider, especially in terms of providing a very rich set of data. In some cases, especially where there are no written sources, interviews can be the only or main source of information. While written sources were available for this study, the interviews were very beneficial, since they provided a big contribution to this study's original empirical research. Even though the interviews were held many years after the events of interest had taken place, raising questions over the reliability of their statements (Tansey 2007: 767), with the passage of time, a historical perspective brought further enlightenment and clarity to these individuals on their personal role and the community's role in these events. In addition, the elite interviews were an ideal source of data collection for this study; given that a state's nuclear policy is highly sensitive, with related decisions being confined to a relatively small number of decision makers. Consequently, most interview subjects requested confidentiality and for the purpose of consistency, all interview subjects have been anonymised.[66]

Further original research – besides the elite interviews – was conducted, including accessing official documents (e.g., texts of joint declarations, legislation, etc.), conference proceedings, and testimonies from congressional hearings. Particularly relevant for the ABACC case were the ABACC website and transcripts from conference proceedings relating to the Argentinean and Brazilian rapprochement.[67] The ABACC website

[66] The UCL Data Protection Registration Reference Number for this study is Z6364106/2010/03/15, Section: 19, Research.

[67] The ABACC website is: www.abacc.org. Conferences include: "Latin American Nuclear Cooperation: Prospects and Challenges", Organised by The Nuclear Control Institute, Washington D.C., Montevideo, Uruguay, 11–13 October 1989 (the conference proceedings are collected in a book by Leventhal and

provided useful data into its background and creation. In addition, it lists the texts of all joint nuclear agreements and declarations in English, Spanish, and Portuguese. The conference proceedings, which included speeches from Argentine and Brazilian scientists and government officials, helped to identify who the key clusters of experts behind the creation of ABACC were and how the nuclear component facilitated the transformation of the Argentine-Brazilian relationship from one of rivalry to that of cooperation.

Particularly relevant for the CTR Program was the U.S. House of Representatives, House Armed Services Committee, which has a list of hearings in the early 1990s on the CTR Program with testimonies from official and non-governmental witnesses. These hearings were accessed using LexisNexis Congressional, which provided a complete transcript of all hearings from the 1991–1996 period. They were crucial in identifying the key people in the nuclear non-proliferation epistemic community behind the CTR Program.

3.5 Conclusion

This chapter discussed the research approach adopted for the purpose of this thesis, including the case study method, process-tracing, and elite interviewing. It reiterated the epistemic community as a framework to be investigated in analysing the chosen cases. The chapter also introduced the two case studies to be explored for the study of the role of epistemic communities in nuclear non-proliferation agreements. The epistemic community framework developed in the previous chapter is applied and examined in the proceeding case study analysis chapters (Chapters Four–Seven).

Tanzer 1992); "Argentina and Brazil: The Latin American Nuclear Rapprochement", the Nahel Soreq Seminar, sponsored by the Institute for Science and International Security (ISIS), Washington D.C., and the Shalheveth Freir Center for Peace, Science, and Technology (Israel), Israel, 16 May 1996; "Regional Safeguards in Latin America: Implications for the Middle East?", the Cairo Seminar sponsored by the Institute for Science and International Security (ISIS), Washington D.C., and the National Center for Middle East Studies (Egypt), Cairo, 27 October 1997; and "Nuclear Rapprochement in Argentina and Brazil", workshop convened by the Center for International Security Affairs at Los Alamos National Laboratory and the Center for Global Security and Cooperation at Science Applications International Corporation (SAIC), SAIC Headquarters, McLean, Virginia, 21 and 22 October 1998.

Case Study One: From Nuclear Rivalry to Nuclear Cooperation: The Role of an Argentine and Brazilian Nuclear Non-Proliferation Epistemic Community in the Creation of the Brazilian-Argentine Agency for Accounting and Control of Nuclear Materials (ABACC)

Chapter Four

Argentina and Brazil's "Suspected" Nuclear Weapons Programme and the Emergence of an Epistemic Community

> "It is in the regional framework that nuclear proliferation takes on its most destabilizing and perverse dimension. It is in the regional context that senseless arms competition between neighbours feeds on itself, resulting in a weakening of global peace. That is why Argentina and Brazil decided to move toward the tightening of the linkages in our respective nuclear policies."
>
> Guido Di Tella, Argentine Minister for Foreign Affairs (1995)

The following two chapters examine the role of an Argentine and Brazilian non-proliferation epistemic community in the creation of the policy behind the Brazilian-Argentine Agency for Accounting and Control of Nuclear Materials (ABACC).[68] ABACC is one of the key factors in the non-proliferation of Argentina and Brazil because it created a bi-national system of mutual inspections and verification of indigenous non-safeguarded nuclear installations between the two states, confirming their non-nuclear weapon status.[69] An Argentine scientist remarked that ABACC is "more than a safeguards agreement: it's a non-proliferation agreement between Argentina and Brazil" (Interview J). In the first chapter, historical background on Argentina and Brazil's suspected nuclear weapons programme is provided and the emergence of an Argentine and Brazilian nuclear non-proliferation epistemic community is analysed. In the second

[68] The acronym for ABACC comes from both the Portuguese (Agéncia Brasileiro-Argentina de Contabilidade e Controle De Materiais Nucleares) and the Spanish (Agencia Brasileño-Argentina de Contabilidad y Control de Materiales Nucleares).

[69] It should be noted that this confidence-building measure of mutual inspections was proof to both Argentina and Brazil (as well as to the international community) that the other was not pursuing a nuclear weapons programme. However, in addition, it should be further noted that only when both states were fully integrated with the IAEA and had signed the NPT was the international community convinced that Argentina and Brazil did not want nuclear weapons. (I thank Dr. James E. Doyle from Los Alamos National Laboratory for pointing this out to me, 14 January 2010.)

chapter (Chapter Five), the process by which the epistemic community influenced the creation of the policy behind ABACC between 1980 and 1991 is examined.

Argentina and Brazil were widely suspected by the international community – as well as by each other – to be pursuing a covert nuclear weapons programme for many reasons. First, both countries were longstanding regional rivals living under military leaderships and had consistently competed for regional hegemony. Even though the last time they had engaged in a bilateral armed conflict was 1825–28 (Schneider 1991: 35–36, Reiss 1995: 52, Sagan 1996/7: 61), the rivalry mainly had a distinct nuclear dimension with the potential of achieving a military dimension.[70] Second, between the 1950s and 1980s, both nations had indigenously developed some aspects of the nuclear fuel cycle, and possessed nuclear facilities that were not subject to regional or international safeguards.[71] Third, both nations refused to get involved in the international nuclear non-proliferation regime by rejecting the NPT, full-scope IAEA safeguards, the Nuclear Suppliers Group (NSG), and the Tlatelolco Treaty.[72] These reasons fuelled widespread suspicion that the two countries were indeed intent on acquiring a nuclear weapons programme (Gamba-Stonehouse 1991, Stanley 1992, Redick, Carasales and Wrobel 1995, Barletta 2000, Paul 2000).

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[70] Some scholars argue that fear of war between the two nations had reached a high point in the 1960s and 1970s, when leading military officials in both countries embraced "zero-sum 'geo-political' doctrines" (Knopf 2003: 201, Selcher 1985: 26–8, 39, Carasales 1992a: 47–8, Hurrell 1998: 230–34). However, neither state had ever seen each other as enemies, nor had they envisioned a nuclear war with one another (Reiss 1995).

[71] The nuclear fuel cycle can be used to produce both weapons-grade fissile material and civilian nuclear energy. Both nations had built a uranium enrichment plant, and Argentina started work on a plant to reprocess plutonium from spent nuclear fuel. Appendix III illustrates the nuclear fuel cycle.

[72] There are many components to the nuclear non-proliferation regime including the NPT (a treaty that establishes norms and supply-side controls), the IAEA (an international organisation that implements rules and inspections), nuclear weapon free zones (areas throughout the world that are protected against the use, storage, and testing of nuclear weapons), and a number of multilateral export control agreements which control nuclear technology supplies (including the NSG and the Zangger Committee). Argentina and Brazil rejected most of these: For example, both nations refused to place their facilities related to producing uranium and plutonium fuel under full-scope IAEA safeguards (IAEA safeguards prevent diversion of nuclear fuel to military uses). In addition, they refused to become parties to the NSG and they rejected the Tlatelolco Treaty, a treaty marking the prohibition of nuclear weapons and establishing a nuclear weapon free zone in Latin America and the Caribbean. It came into force in 1969 in spite of Argentina's initial

However, contrary to these fears, the two former rivals did not become nuclear weapon states. Scholars have offered a number of reasons as to why Argentina and Brazil did not proliferate. These include both countries' transition to democracy in the mid 1980s (Solingen 1994, Paul 2000, Levite 2002/3, Müller and Schmidt 2010), the pursuit of economic liberalisation in the mid-late 1980s (Solingen 1994), trust building through confidence building measures (Redick 1995, Reiss 1995, Wheeler 2009), and the psychology of the leadership (Hymans 2006).[73] In fact, the end of Argentina and Brazil's rivalry was marked by a gradual nuclear rapprochement process, which can be traced back to the late 1960s/early 1970s.[74] Even though this period marked an intense rivalry (particularly in the nuclear sphere), the development of a common position during the negotiations on the Tlatelolco Treaty in the mid 1960s and a shared hostility to the international nuclear non-proliferation regime in the 1960s/1970s emerged between the two states, facilitating the process of nuclear cooperation.[75]

It can be argued that the pivotal turning point in the Argentina-Brazil nuclear rapprochement was marked by the signing of the May 1980 Accord on Cooperation for the Development and Application for the Peaceful Uses of Nuclear Energy – the two countries' first joint nuclear agreement. Over the next 11 years, the nuclear rapprochement was firmly grounded because by July 1991, the presidents of Argentina and Brazil signed the Guadalajara Agreement, which established the creation of ABACC. Interestingly, the creation of ABACC and how it verified Argentina and Brazil's non-nuclear weapon status has been overlooked in the existing literature. Furthermore, its

refusal to ratify it. Argentina eventually ratified it in 1994. (In 2002, all 33 nations of Latin America and the Caribbean had signed and ratified the treaty. For more on the Tlatelolco Treaty, see Redick 1981.)

[73] It should be noted that Hymans work analysed the psychological profile of Argentinean leaders facing decisions about whether to pursue nuclear weapons.

[74] The term "rapprochement" refers to both Argentina and Brazil's bilateral relations and to their gradual integration into the nuclear non-proliferation regime.

[75] In addition, scholars have remarked that the resolution of territorial disputes in the late 1970s helped influence the rapprochement (Redick 1995, Resende-Santos 2002, Kupchan 2010).

significance relating to Argentina and Brazil's subsequent integration within the nuclear non-proliferation regime has been underestimated. While both nations were initially hostile to the non-proliferation regime, it is worth noting that *after* the creation of ABACC in 1991, Argentina and Brazil became fully integrated within the non-proliferation regime by signing various international non-proliferation agreements, including the NPT.

Consequently, the focus of this research is on the origins of ABACC. The analysis of this case study indicates that an Argentine and Brazilian epistemic community drove the thinking behind the mutual inspections and safeguards verification system that was subsequently implemented as ABACC. The creation of ABACC was a remarkable accomplishment given that the two nations had hitherto been embroiled in a century-long rivalry. It is therefore quite significant that the one sensitive area in which they were competing, mistrusting, and suspicious, in fact, brought them closer together.

The chapter is structured in five parts. The first section provides detailed information on Argentina and Brazil's suspected nuclear weapons programme (including the birth, motivations, and technical infrastructure of the programmes), in order to ascertain the extent of the international community's fears of a nuclear Argentina and Brazil. The second section analyses Argentina and Brazil's competition, focusing particularly on their nuclear rivalry. The third section explains the evolution of Argentina and Brazil's common position taken against the international nuclear non-proliferation regime. The fourth section discusses the extent to which their common anti-nuclear non-proliferation regime position paved the way towards a nuclear partnership. The fifth section investigates to what extent their shared interests and similarities prompted the emergence of an Argentine and Brazilian nuclear non-proliferation epistemic community.

4.1 Argentina and Brazil's Nuclear Programmes

It is important to trace the development of Argentina and Brazil's nuclear programmes because

> Their competition to be number one in this crucial area led to an action-reaction pattern. [...] The similar and slightly parallel paths that characterised their early nuclear development later went in different technological directions and resulted in quite different outcomes (Adler 1987: 280).

Both nations launched their nuclear programmes in the mid-1950s soon after U.S. President Dwight D. Eisenhower's "Atoms for Peace" programme proposal.[76] This programme served as a catalyst for many nations seeking nuclear power. It was designed to control the spread of nuclear weapons technology by providing nuclear know-how to be used for peaceful purposes only. It made the prospects of science, medicine, and industrial development derived from the use of nuclear technologies extremely attractive to many nations.[77] Under the programme, the U.S. supplied equipment and technical information to countries throughout the world. As an example, the U.S. provided technical information, training, and subsidies to encourage nuclear development in Argentina and Brazil (Barletta 2000: 99). With the help of the "Atoms for Peace" programme, Argentina was able to train 200 scientists and build its first nuclear research reactor in 1958 – the very first reactor in South America (Adler 1987: 291, Hirdman et al. 1972: 50); and Brazil was able to purchase several research reactors – its first one obtained in 1971 (Squassoni and Fite 2005: 16).

The "Atoms for Peace" programme deemed atomic energy as safe, inexpensive, and a readily available power supply of the future. Nuclear technologies came to symbolise both modern development and the prospect of a cheap and reliable source of energy (e.g., nuclear energy). Since Argentina and Brazil were two countries seeking

[76] Eisenhower launched "Atoms for Peace" before the United Nations in 1953.
[77] Between 1954 and 1958, the U.S. reached 22 bilateral agreements for nuclear cooperation (Barletta 2000: 129).

economic development and technological autonomy, acquiring nuclear energy was an important step to assert themselves as "modern nuclear" powers. Both countries' pursuit of an indigenous nuclear fuel cycle was driven by their desire to claim technological autonomy without having to rely on foreign sources of energy. Acquiring complete mastery of the nuclear fuel cycle was tantamount to ensuring their status as world players. As an example to illustrate the necessity of acquiring a nuclear fuel cycle, former Brazilian army minister General Leonídas Pires Gonçalves said, "Countries that do not complete the nuclear fuel cycle by the 21st Century, will not be considered a world player" (quoted in Spector 1987: 202).

After Argentina and Brazil launched their nuclear programmes in the mid-1950s, there was initial enthusiasm among scientists, military officers, and government officials – all of whom accepted the need for a national nuclear programme. The prevailing view among scientists in Argentina and Brazil in the early 1950s was that nuclear energy represented a "panacea for national improvement" (Wrobel and Redick 1998: 171). However, their justification was not based on a military/security rationale, but rather, as mentioned above, as a means to independent national development and economic advancement (Redick 1995: 46). Yet, in spite of the initial enthusiasm, nuclear activities remained modest in both countries throughout the 1950s and the early 1960s. Their main activities included educating and training experts, establishing nuclear physics research institutes and atomic energy commissions, buying and constructing research reactors, and initiating programmes based on natural uranium technology (Adler 1987: 280, Wrobel and Redick 1998: 172). Soon after, however, both countries invested heavily in building nuclear power reactors. In particular, investment went into efforts to master two highly sophisticated and essential technologies for the nuclear fuel cycle: uranium enrichment

and plutonium reprocessing.[78] Both nations mastered these components on a pilot scale at different times: Argentina in 1983; Brazil in 1987. These acts – coupled with their disregard for the international non-proliferation regime – fuelled international suspicions that the two nations were taking actions that could lead to a nuclear arms race.[79]

In spite of the widespread suspicion that Argentina and Brazil were pursuing nuclear weapons, representatives from both the Argentine and Brazilian governments – particularly Argentine – consistently denied any intention to develop a nuclear weapons programme. For example, in 1975, General Juan E. Guglialmelli, former director of the Argentine Institute of Strategic Studies and International Relations, wrote,

> Recently both a former foreign minister and the President of the CNEA [the National Atomic Energy Commission of Argentina] have declared that our country has no intention of building nuclear explosives (1976: 165).

Five years later, Vice-Admiral Carlos Castro Madero, former President of CNEA, said, "Argentina is not even thinking of developing a nuclear explosive" (quoted in Schumacher 1981: 3) nor does it have "any intention of developing its nuclear technology for military purposes" (quoted in Pilat and Donnelly 1982: 13). In 1983, after announcing that Argentina had developed the technology to enrich uranium, he said that Argentina would use its new nuclear capacity only for "peaceful ends" (quoted in Schumacher 1983: 1). In addition, he was adamant that Brazil was not producing nuclear weapons. He said, "It would be impossible for Brazil to conduct a military programme" (quoted in Pilat and Donnelly 1982: 13). Oscar Camilión, former Argentine Ambassador to Brazil, stated that he never heard any consequential Argentine official say that the country needed nuclear weapons. He also reportedly told the Brazilian press that he had

[78] Appendix III illustrates the nuclear fuel cycle and it shows how uranium enrichment and plutonium reprocessing are the crucial technological steps towards nuclear weapons production.

[79] Throughout the 1970s and 1980s, Argentina and Brazil were repeatedly considered "threshold" states by the international community (especially the U.S., and often the IAEA) alongside India, Israel, Pakistan and South Africa, countries that indeed in later years became nuclear weapon states (Graham 1980, Koven and Graham 1981, *Washington Post* Editorial 1982; 1982a; 1985; 1985a, Fishlock 1982; 1984, Johns 1982, Miller 1982, Halloran 1982; 1984, Benjamin 1983, Schumacher 1984, Hiatt 1984, Riding 1986, Albright 1989, Spector and Smith 1990).

"no doubt" of the peaceful intentions of the Brazilian programme (quoted in Hymans 2006: 160).

However, the message emanating from representatives of the Brazilian government was not quite as convincing. Ministers from the Brazilian armed forces did express the intent to develop nuclear weapons primarily as a symbol for attaining a great-power status. For example, former navy minister Admiral Maximiano Fonseca stated in September 1986,

> If it was up to me to decide, I would make an atomic bomb and detonate it in front of international observers to demonstrate the extent of national technical know-how (quoted in Spector 1987: 206).

A few years later, Brazilian Secretary of State for Science and Technology José Goldemberg publicly stated that he was "convinced that the army would build nuclear explosives and would intend them to be nuclear weapons" (quoted in Albright 1997: 46). It was not until 1988 that the Brazilian government made it clear that it was not intent on pursuing nuclear weapons when the 1988 Brazilian Constitution added a requirement for the use of nuclear energy to be "exclusively for peaceful purposes" (Lamazière and Jaguaribe 1992: 110). It assured that "all nuclear activity in Brazil would only be allowed for peaceful purposes and upon Congressional approval" (Albright 1997: 44).[80]

In spite of these declarations, the international community was still suspicious over Argentina and Brazil's nuclear intentions because of their attempts to acquire a nuclear fuel cycle and because of their increasing disdain towards the international non-proliferation regime. Argentina and Brazil repeatedly insisted on their right to conduct peaceful nuclear explosions, refused to submit their sensitive facilities to IAEA safeguards, and continually opposed the Treaty of Tlatelolco and the NPT, all of which

[80] In many of the interviews conducted for this research, representatives from Argentine and Brazilian governments consistently denied that their countries were working towards a nuclear weapons programme (Interview A, Interview B, Interview E, Interview F, Interview G, Interview H, Interview J, Interview L, Interview M, Interview O, and Interview S). See also Hymans 2001, the first study based on a review of

they viewed as violating their national interests and national sovereignty. In addition, both countries were led by the military and, as such, the involvement of the armed forces in both countries' nuclear affairs aroused further suspicion, particularly in Brazil.

The Brazilian military worked on a secret "parallel" programme. The "parallel" refers to the programme running alongside the official programme (Wrobel 1996: 342). However, the intentions of the "parallel" programme remain controversial. Some argue that the parallel programme was the Brazilian military's covert attempt at pursuing nuclear weapons (Spector and Smith 1990, Krasno 1992; 1994, Reiss 1995, Doyle 1997; 2008, Barletta 1997), while others insist (particularly Brazilians) that the nuclear weapons argument was seriously flawed (Wrobel 1996, Lamazière and Jaguaribe 1992). According to Paulo S. Wrobel (a Brazilian diplomat),

> It was argued that if the armed forces were so deeply involved in nuclear research and development that certainly meant they were not interested solely in peaceful purposes. Despite its apparent logic, this argument is seriously flawed because it fails to consider the role played by the three branches of the armed forces in the development of science and technology in Brazil, at both research and production level. For historical reasons, the Brazilian military had long been deeply involved in the development of many areas of modern science and technology, including branches of engineering, telecommunications, nuclear, computing and aeronautics. Attributing a weaponry intention to the parallel nuclear programme simply because it was directed by navy officers revealed a lack of understanding of the historical role of the military in Brazil's technical and scientific development (1996: 342–43).

However, another Brazilian diplomat, Marco Marzo (a former senior planning and evaluation officer at ABACC), explained that the military in Brazil was involved in *every* important development in Brazil (Marzo 1996: 2). This would undoubtedly include nuclear development in the parallel programme.[81]

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hundreds of previously secret Argentine nuclear policy documents, which confirms that Argentina's nuclear programme was not aimed at building nuclear weapons.

[81] Resende-Santos (2002: 106) notes that Brazil's nuclear energy programme was under the military's control, with overall supervision and planning by the powerful, military-dominated National Security Council (CSN), the highest organ of national security decision making. Further, he notes, that the nuclear research agency, the military-controlled National Commission on Nuclear Energy (CNEN), also coordinated the parallel nuclear programme.

Even though Argentina was also led by the military, the role of the Argentine military in nuclear development had always been minor. Ambassador Julio C. Carasales, a respected former Argentine diplomat, remarked,

> The armed forces never had nuclear programs or participated in nuclear research and development. The only reason usually given to substantiate such repeated assertions is that, for many years, the heads of the Argentine National Atomic Energy Commission were retired navy officers. But the Commission was never under the authority of the navy. It was always subject directly to the control of the executive and its personnel were overwhelmingly civilian, as were the Commission's board of directors (1995: 48, fn.20). [82]

In order to understand the context within which the nuclear rapprochement and an epistemic community emerged, it is important to analyse the birth, motivations, and the technical infrastructure of Argentina and Brazil's nuclear programmes, which are considered in turn below.

Argentina's Nuclear Programme

a) Birth and Motivations

By the late 1940s, Argentina was the most powerful (economically and politically) country in South America. It was in this context that the Argentine atomic energy project was born (Gamba-Stonehouse 1991: 230–231). In 1950, the pursuit of nuclear energy resonated well with President Juan D. Perón's (1946–1955) search for regional leadership and prestige (Spector and Smith 1990: 223–224). Ronald Richter, an Austrian physicist formerly employed in the Third Reich's nuclear programme, convinced Perón that he could take Argentina to the forefront of nuclear technology and at less cost than the investments made by the U.S. and the USSR (Poneman 1987: 174–175). Perón, keen to

[82] This was corroborated by two Argentine diplomats. One remarked that nuclear issues in Argentina were "100% civilian" (Interview F). The other remarked that Argentina's nuclear programme "was a civilian programme run by civilians" (Interview S). Carasales (1928–2000) was an active member of the Argentine Foreign Service and held many governmental positions, including sub secretary of the Foreign Affairs Ministry, ambassador to Denmark and to the Organization of American States (OAS), and Director of the Department of International Organizations and of the Institute of the National Foreign Service. He was also a permanent representative to the IAEA, and was head of the Argentine delegation to the UN Disarmament Conference in Geneva from 1981–1985. He wrote extensively on Argentina's nuclear issues, especially regarding the Argentine-Brazilian nuclear rapprochement.

demonstrate his country's technological prowess, recruited Richter as the director of a research facility on Huemel Island in northern Patagonia. In 1951, Perón announced that Richter had achieved a controlled thermonuclear fusion reaction. This was discounted by leading physicists around the world, and, as a result, Richter was exposed as a fraud, and he and his staff were consequently dismissed and the Huemel facility was dismantled (Poneman 1987: 175).

In spite of Richter squandering nearly $70 million, the incident did not inhibit Argentina's nuclear programme (Poneman 1987: 175). After Richter's dismissal, the programme was entrusted to the National Atomic Energy Commission (CNEA). Established on 31 May 1950 by President Perón, CNEA was an independent public agency directly linked to the president and set up to design and coordinate national policies for scientific and technological development (Fabbri 2005: 121). Under the leadership of Pedro Iraolagoitia and Oscar Quihillalt (CNEA's respective first and second Presidents), CNEA hired scientists and developed a high-quality management team that was separate from the Argentine government. In fact,

> CNEA became a nonpartisan organisation, enjoying continuity of leadership and political autonomy, consensus and insulation that allowed it to impose a programme and an ideology onto the political elites (Adler 1987: 280).

CNEA was the one institution throughout Argentina that centralised all matters of nuclear development, from mining to reprocessing and from technical training to nuclear-plant building. Between 1950 and 1983, the leadership of CNEA was held by the Navy and had only four presidents. With the return of democratic rule to Argentina in 1983, Alberto Constantini became the first civilian to head CNEA, replacing the respected Admiral Carlos Castro Madero, a staunch advocate of nuclear development (Adler 1987: 293–294).

It can be argued that there were three main motivations to the Argentine nuclear programme which remained constant throughout Argentina's nuclear history, in spite of

the change in the country's leadership. These included Argentina's search for national pride and prestige, including its desire to be technologically superior, its aim to achieve nuclear technological autonomy in order to be self-sufficient in (nuclear) energy, and for reasons of national security. In fact, as an Argentine diplomat remarked in an interview,

> One of Argentina's priorities was the need to find a way for independent technological grow[th] through the export of technologies given our financial limitations and the level of development we had. We concentrated on this objective. Our competitors were too important for a country of our size. The need of the flag of non-proliferation was necessary to facilitate our entrance in the market. Our needs in sensitive technology, like enrichment, were related to be a reliable supplier of fuel given the limitations of the time. That was essential for the type of product we had. Our research reactor for export needed fuel with low enrichment.
>
> Brazil, actually, was not on our agenda. Only when we needed to present ourselves as a leading supplier of technology, the question of strengthening of bilateral mechanisms came to mind. It was not because of distrust, although it could have been the case if our thoughts were in a different dimension. Our priorities were of a commercial nature (Interview L).

As noted earlier, the Argentine nuclear programme was initially grounded in the country's senior leaders' search for prestige and national pride. Working for the country's nuclear programme generated an overwhelming sense of pride. In the interviews conducted for this research, many interviewees remarked that scientists who worked on the programme were viewed as "national heroes" and "icons".[83] In fact, when the Argentine programme began to produce results, it was embraced as a "national cause, a source of pride" (Adler 1987: 299). The nuclear programme had the overall support of society, with very little opposition to the programme, either on technological or environmental grounds (Wrobel and Redick 1998: 173). It is quite telling that, until the 1980s, there were "no 'greens', anti-nuke movements, Pugwash-oriented physicists, and no fears of Three-Mile Islands or the 'day after'" in Argentina (Adler 1987: 299).[84]

[83] Interview A, Interview F, Interview H, and Interview K.

[84] Montenegro (2007: 259) explains that from the beginning of the 1980s, the Argentinean antinuclear movement was born. Anti-nuclear movements in Argentina include the Fundacion para la Defensa fel Ambiente (FUNAM), the Movimiento Anti-nuclear del Chubut (MACH), and Tierralerta. He argues that these movements were strengthened by Greenpeace Argentina from 1988.

Working towards nuclear development was another motivation for the Argentine nuclear programme. Argentina's pursuit of an indigenous nuclear fuel cycle was driven by its desire to claim technological autonomy. Argentina had historically relied heavily on imported energy resources which raised concerns about dependence on foreign-supplied fuels for economic development. Until the mid-1960s, a combination of government policies and bureaucratic mismanagement caused Argentina's hitherto substantial oil production to lag, and nuclear energy as a source of electricity comprised a crucial component in Argentina's economic development strategy (Poneman 1984: 861). In addition, Argentina had abundant uranium reserves, and since it was concerned about the need to diversify and create new energy sources, nuclear energy was seen as the most natural resource to develop (Adler 1987: 299). Equally important were the spin-offs created from the nuclear programme, such as engineering and construction skills learned from building the nuclear infrastructure, and technologies developed for the nuclear industry that could be applied and used in other sectors of the economy to bolster development and boost economic growth (Poneman 1984: 861).

The final motivation for Argentina's nuclear programme was related to its national security. Argentina had reasonably limited disputes with its neighbours and was not engaged in geopolitical disputes, apart from the traditional issues with the UK relating to the Malvinas/ Falklands Islands and territorial disagreements with Chile over Patagonia (Gamba-Stonehouse 1991: 231). But its primary security focus was Brazil, whose larger population, rapid modernisation, ties to the U.S., and nuclear programme evoked concern in some Argentine political and military circles. Some Argentines described Brazil as the *país llave* ("key country") of American influence on the continent (Waisman 1975: 286). Further, the emergence of the Brazilian nuclear programme provided a rationale for Argentina to pursue its own nuclear programme. Even though the last time both countries had engaged in a bilateral armed conflict was in 1828

(Schneider 1991: 35–36, Reiss 1995: 52, Sagan 1996/7: 61), the traditional Argentina-Brazil rivalry coupled with the emergence of the Brazilian nuclear programme was enough reason for the Argentines to want to pursue a nuclear programme.

b) Technical Infrastructure[85]

Argentina possesses the oldest and most sophisticated nuclear energy programmes in South America (Reiss 1995: 46). It accomplished many "firsts" in its pursuit of an indigenous nuclear fuel cycle: among its achievements, Argentina operated the region's first research reactor, electric power reactor, nuclear fuel fabrication facility, and plutonium extraction plant (Poneman 1984: 857). By 1953, CNEA had launched a nuclear research programme and had started mining uranium. In 1958, Argentina emerged as the first Latin American state to operate a nuclear research reactor (Gall 1976: 155). By the 1960s, Argentina could build its own research reactors and had mastered nuclear fuel element processing (Doyle 2008: 311). Under the guidance of Dr. Oscar A. Quihillalt, CNEA's first President, who ruled for over 18 years (and saw eight Argentine presidents sworn in and then ousted),[86] CNEA and the atomic programme grew into the most successful institution and national programme Argentina ever had: objectives were formulated and partially achieved, the science and technology infrastructure was built, human resources were nourished, the road towards autonomy was traced, research reactors and other atomic facilities were built, and Atucha I – the region's first power reactor – was almost completed (Adler 1987: 291).[87]

[85] Appendix VI presents a diagram illustrating Argentina's nuclear infrastructure.
[86] Appendix IV lists the governments of Argentina and Brazil from 1946–1995.
[87] Atucha I was bought from the West German company Siemens A.G. (Redick 1975: 418).

Since a 1960 decree declared CNEA to be "high national interest", Argentina's desire to achieve nuclear technological autonomy was fulfilled when, over the years, it developed an autonomous nuclear fuel cycle. Under the direction of CNEA, Argentina developed domestic reprocessing technology and uranium enrichment, which, as shown in Appendix III, are the main ingredients for both fabricating nuclear explosives and fuelling breeding reactors. As an Argentine diplomat explained, "Argentina's nuclear programme was directed to acquire the know-how to all aspects of the nuclear fuel cycle because we wanted to be capable of developing nuclear energy for peaceful purposes" (Interview O).

In 1978, the Argentine government announced its intention to construct a spent fuel reprocessing facility in Ezeiza (Reiss 1995: 47). This would be Argentina's main facility for reprocessing plutonium – a key element in both electricity production and nuclear weapons production.[88] CNEA President Castro Madero asserted that plutonium extraction from spent fuel was necessary for three reasons. First, recycling plutonium in Argentina's existing reactors would reduce the requirement for uranium by 50 per cent. Second, plutonium production was an integral element in developing breeder reactor technology (which produces more fissionable material than it consumes, thereby posing a serious proliferation issue because it yields fissionable material that can be used in nuclear weapons). Third, in order to be competitive with other nuclear suppliers, Argentina needed to develop similar skills, which included plutonium recovery (Poneman 1984: 865). However, the Ezeiza facility was shut down in 1990 due to economic constraints and political pressure from the U.S. (Redick 1996: 2). It had planned to be in operation by the early 1980s, providing Argentina with direct access to weapons-usable plutonium (Doyle 1997: 132).

[88] Appendix III illustrates the nuclear fuel cycle.

Argentina also began the clandestine construction of an unsafeguarded gaseous diffusion plant at Pilcaniyeu in 1978. At this facility, uranium hexafluoride gas would be processed through porous membranes to separate the fissionable isotope uranium-235 (U-235) from the nearly unfissionable uranium-238 (U-238) (Milhollin and Weeks 1991: 27). The apparent motivation for the Argentines to begin construction of this facility was in response to Brazil's purchase of a complete nuclear fuel cycle from West Germany, discussed below (Reiss 1995: 47). This plant had been kept secret and was revealed only weeks before the inauguration of civilian president Raúl Alfonsín in 1983, when on 19 November 1983, Rear Admiral Carlos Castro Madero, president of CNEA, announced that Argentina had developed the technology to make enriched uranium. Reiterating the self-sufficiency and developmental goals of Argentina, he said, "This demonstrates the failure of the policies of the great powers of not providing technology to the countries that are on the road of development" (quoted in Schumacher 1983: 1). The announcement marked Argentina's final stage in completing the nuclear fuel cycle, making it nuclear independent.[89] Theoretically, the plant had the potential to enrich enough weapons grade uranium for four to six nuclear bombs per year (Spector and Smith 1990: 228). The secrecy surrounding both the Ezeiza and Pilcaniyeu plants and the lack of IAEA safeguards on both facilities aroused suspicions by the international community that Argentina was intent on pursuing a covert nuclear weapons programme. However, as articulated earlier, successive Argentine governments consistently denied any intention to develop a nuclear weapons programme.[90]

Despite Argentina's progress in the nuclear field, its nuclear programme suffered several technical and financial setbacks. Maintenance problems at the Atucha I reactors

[89] It should be noted that before CNEA publicly announced that it had mastered uranium enrichment, Argentine officials had briefed Brazilian authorities (Wrobel 1999: 143).
[90] Redick (1997: 14) notes that amongst the highest political level in Argentina, there was an understanding that development of nuclear weapons might ultimately impede the civil nuclear programme due to the inevitable strong reaction of foreign nations.

caused the power reactors to operate sporadically (Reiss 1995: 56). The Atucha II power station encountered funding constraints that delayed construction (Reiss 1995: 56, Spector and Smith 1990: 231). Plans for four more nuclear power stations were cancelled (Reiss 1995: 56). Construction at the Ezeiza plutonium extraction facility was postponed indefinitely in 1990 (Milhollin and Weeks 1991: 27, Spector and Smith 1990: 232). Finally, the Pilcaniyeu facility experienced technical problems and funding shortfalls (Reiss 1995: 56).

Argentina's success in developing a near-autonomous nuclear energy programme can be credited mainly to CNEA (Adler 1987: 280). Despite the fall of Perón and the subsequent change from military to civilian governments, CNEA continued to function in an organised manner and "continued to seek without interruption the goal of energy self-sufficiency for Argentina based upon nuclear power" (Gamba-Stonehouse 1991: 231). As an independent public agency, it did not have policy imposed from above, but instead, developed its own policies and then sold them to the highest political levels. This process remained intact throughout both military and civilian governments and allowed CNEA to develop a consistent policy without being affected by the many changing presidents and their advisors. This enabled CNEA to persist with its technological, industrial, and energy objectives and maintain a civilian nature of the nuclear programme (Adler 1987: 301).

Brazil's Nuclear Programme

a) Birth and Motivations

Brazil's interest in nuclear research can be traced back to the 1930s when initial studies on nuclear fission took place and when Brazilian scientists began experimenting with nuclear fission. However, their efforts began in earnest after Argentine President Perón made the false claim in 1951 that Argentine scientists had mastered thermonuclear fission

(discussed above). In response, Brazil created a nuclear research programme under Conselho Nacional de Pesquisas (CNP), the country's natural research council. With an abundance of uranium deposits and a more advanced industrial infrastructure than Argentina, Brazil was ready to develop an independent nuclear programme by the mid-1950s. The National Nuclear Energy Commission (CNEN) was created in 1956 under Brazil's President Juscelino Kubitschek.

By 1959, planning began for a nuclear reactor to produce electricity, and up until 1971, the Brazilian nuclear programme had been a modest effort. In 1972, the Brazilian government purchased a power reactor from the U.S. company Westinghouse, who would also supply the technology.[91] Soon after, construction of an electric generating station began at Angra dos Reis to house the country's first power reactor – the 626 megawatt Angra I.[92] The deal was problematic from the start: Brazil sought a complete nuclear fuel cycle that included uranium enrichment and plutonium recovery technology in addition to the nuclear reactors (Myers 1984: 885). Yet, since Brazil was not a signatory to the NPT, the U.S. government prohibited U.S. companies from selling such technology to Brazil. As a result, the Brazilians engaged in negotiations with the West German company Kraftwerk Union (an affiliate of Siemens) to build several more nuclear power plants and for a complete nuclear fuel cycle (Krasno 1994: 429).

Marked as the "nuclear deal of the century" (Guglialmelli 1975: 162), Brazil's June 1975 agreement with West Germany was a multibillion-dollar (US$10 billion) agreement, representing the first sale of a complete nuclear fuel cycle and one of the largest transfers of nuclear technology to a developing nation (Redick 1995: 7). The agreement enabled Brazil to purchase four nuclear 1350 megawatt pressurised water

[91] In 1968, CNEN had decided to build a nuclear power plant, and in 1971, contracts were signed between Brazil and Westinghouse.
[92] Angra I began commercial operation in 1985. It has been an inconsistent producer of electricity that it was dubbed "the Firefly" by environmentalists for its propensity to go offline (Squassoni and Fite 2005, fn 5).

reactors, with the option for another four by 1990; the development of uranium processing, conversion, enrichment, and reprocessing facilities; a uranium prospecting venture; the construction of a plant to produce fuel elements and pilot plant for reprocessing nuclear fuel; the establishment of an engineering firm to handle key sections in the construction of the plants, and a plant to manufacture large components (Adler 1987: 282).

Similar to Argentina, there were three main motivations to the Brazilian nuclear programme that led to the deal with West Germany: achieving technological autonomy and nuclear independence, prestige, and the progress of Argentina's nuclear programme. As a former Brazilian senior planning and evaluation officer at ABACC observed,

> Both countries were motivated [for the nuclear programme] because neither had access to nuclear technologies. They needed this technology to produce electricity. For example, 95% of Brazil's electricity is generated from hydroelectric plants. Brazil doesn't have oil-fuelled power plants, and the only water resources are very far from populated areas.
>
> […] To some extent, the developed countries forced Argentina and Brazil to undertake their domestic programmes. During the 1970s and 1980s, the nuclear programmes in the two countries had a difficult time getting needed technologies from foreign suppliers (Marzo 1997: 57).

The policy of nuclear independence was pursued by the Brazilian government as a method to satisfy Brazil's growing electrical energy requirements. The oil crisis of 1973 and the subsequent dramatic rise in oil prices in 1974 convinced the Brazilian government that they could no longer rely on expensive foreign oil, which constituted 80 per cent of Brazilian consumption in 1974 (Redick 1975: 423). Brazil had also relied heavily on hydroelectric power but studies indicated that by 1985, the potential to expand hydroelectric capacity would be exhausted (Rosenbaum 1975: 262, Schneider 1976: 93). Nuclear energy therefore appeared as a relatively inexpensive and plentiful source of electrical energy to sustain economic growth.

Similar to Argentina, the Brazilian government believed that acquiring a nuclear programme would grant the country notable prestige and would boost the country's

standing within the international community. After signing the agreement with West Germany, Brazil's foreign minister remarked that Brazil had "gained new technological and political status on the world scene with the nuclear agreement" (quoted in Howe 1975: 2). In addition, the 1974 Indian detonation of a nuclear device may have also reinforced a long-standing Brazilian belief that nuclear programmes and international prestige were linked (Rosenbaum 1975: 261).

The final motivation for Brazil's nuclear programme was related to Argentina's progress in nuclear issues. Brazil was fearful of falling behind Argentina's accomplishments: by 1975, when Brazil had signed the agreement with West Germany, Argentina's Atucha I reactor had already started operating. In order to prevent further lagging behind Argentina and to remain as a viable regional competitor, Brazil needed a similar – if not more – sophisticated programme. The West German agreement represented such ambition and a desire to surpass Argentina in that the reactors received would be more advanced than those being constructed in Argentina (Rosenbaum 1975: 261). Therefore, the West German deal would enable Brazil to overcome Argentina's lead in the nuclear field. In addition, the Brazilian government followed Argentina's nuclear programme progress closely and believed that Argentina intended to develop nuclear weapons. It believed that because the Argentines were developing nuclear weapons, Brazil should follow suit. The Brazilians feared that Argentina felt threatened by Brazil's size, wealth, and modernisation, and would use nuclear weapons to imbalance the power relationship between the two countries (Rosenbaum 1975: 267).

b) Technical Infrastructure[93]

Nuclebrás (the state-owned Brazilian Nuclear Corporation) and Kraftwerk Union (the nuclear branch of Siemens) jointly managed the 1975 West Germany and Brazil

[93] Appendix VII presents a diagram illustrating Brazil's nuclear infrastructure.

agreement. In addition to nuclear reactors, West Germany was expected to provide a reactor fuel fabrication plant, a pilot-scale plutonium extraction facility, and a commercial-scale uranium enrichment plant that used Becker nozzle technology (an aerodynamic uranium enrichment method that separates U-235 from U-238) – all, with the exception of the reactors, to be located at the Resende complex (Spector and Smith 1990: 261).

The West German deal – particularly the uranium enrichment and plutonium recovery plants because of their potential use in a nuclear weapons programme – heightened proliferation fears amongst the international community and provoked a strong negative U.S. reaction, particularly in the aftermath of India's 1974 nuclear test (Rosenbaum 1975: 257). Although the U.S. was unable to prevent the deal entirely, it persuaded West Germany to require bilateral safeguards on the technology it transferred (Squassoni and Fite 2005: 16). In the end, the deal produced modest results compared to its original scope.[94] This was in part due to the lack of authority and continuity that shaped Brazilian nuclear affairs. Unlike in Argentina, the administration of the Brazilian nuclear programme was neither sustained nor maintained by a centralised nuclear energy commission. CNEN, unlike CNEA, was not the central institution on nuclear affairs. Nuclear affairs were dominated by the armed forces. In addition, the 1975 agreement was imposed from above, keeping the scientific community outside of the policy-making process. In contrast to Argentina, where scientists were the core of CNEA and where policy was developed within CNEA, policy was not developed within CNEN amongst Brazilian scientists.[95] Instead, in Brazil the powerful National Security Council (CSN)

[94] Construction of Angra-2 and -3 fell behind schedule and over budget (Reiss 1995: 56). The Becker nozzle technology proved unworkable in practice (Squassoni and Fite 2005: 16). The Resende reprocessing plant was postponed indefinitely (Spector 1990: 243). Only Angra-2 was completed, which began operating in 2000 (Squassoni and Fite 2005: 16).

[95] Wrobel and Redick explain that in Argentina, the nuclear programme had the overall support of society with very little opposition. However, in Brazil, nuclear activities were very controversial and major decisions were sharply criticised by leading scientific organisations, in particular those led by nuclear

dominated the policy-making process.[96] The CSN was the highest organ of national security decision-making (comprising the president and heads of the armed forces) and it was firmly in control of most of the "parallel" programme (Adler 1987: 320).

The West German deal raised suspicions regarding Brazil's nuclear intentions, and it marked the birth of the secret "parallel" programme (Krasno 1994: 430, Gall 1976). Brazil's nuclear programme was divided between a civilian-led IAEA-safeguarded programme and an indigenous unsafeguarded "parallel" programme controlled by the military (Redick 1995: 6). The former was a publically acknowledged nuclear energy programme and up until 1988 was managed by the state-owned Nuclebrás. The latter was a secret programme controlled by the military and CNEN to acquire the means to produce weapons-usable fissile materials and enrich uranium for naval propulsion reactors (Spector and Smith 1990: 243, Doyle 1997: 134).[97] The secret and autonomous parallel programme was created to develop the nuclear fuel cycle outside of international safeguards. Under the stewardship of the Brazilian Navy's Special Projects Coordinating Board (COPESP: Coordenadoria de Projetos Especiais), the programme initially focused on developing a small light-water reactor for submarine propulsion and an indigenous uranium-enrichment capability using centrifuges (Squassoni and Fite 2005: 16). The parallel programme had not been officially acknowledged until 1987, when President Sarney announced that Brazil had developed ultracentrifuge technology (Stanley 1992: 199). In fact, in August 2005, Sarney publicly confirmed that during the 1970s and 1980s,

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physicists, particularly José Goldemberg from the University of São Paulo who later became Collor's Minister of Science and Technology (1998: 173, 180, fn 15). Paul also remarks on the opposition by leading nuclear scientists and in addition to Goldemberg, includes David Simin and Luiz Pinguelli Rosa (2000: 108).

[96] In addition, the 1975 agreement created a major rift between Brazil and the U.S. as the U.S. strongly opposed the deal and launched a number of retaliatory measures against Brazil, including banning the export to Brazil of certain products.

[97] The secret "parallel" programme was developed during the military regime (1964–1985) and continued into the administration of José Sarney (1985–1990), Brazil's first civilian president in 21 years (Krasno 1994: 429).

the Brazilian military had sought to develop nuclear weapons "to counter political and military competition from Argentina" (quoted in Squassoni and Fite 2005: 16).

All three branches of the Brazilian military were involved in the parallel programme, each using different technologies for nuclear enrichment. The Navy's COPESP, in collaboration with the Institute for Nuclear Energy Research (IPEN) in São Paulo, had developed a laboratory-scale gas centrifuge enrichment plant. The objective of this programme was to produce naval propulsion fuel for submarines (Marzo 1997: 34, Goldemberg 2006: 41). The Air Force investigated laser enrichment of uranium and breeder reactors at the Center for Aerospace Technology (CTA) in São José dos Campos near São Paulo. In addition, the air force began secretly to prepare deep wells for testing nuclear explosives in the distant state of Para in northern Brazil (Goldemberg and Feiveson 1994: 12). The Army developed a jet nozzle enrichment facility at Resende, near Rio de Janeiro, and gas graphite reactors at Centro Tecnológico do Exército (CETEX) in Guratiba, outside Rio de Janeiro, which could have been well-suited for the production of weapons-grade plutonium (Krasno 1994: 430–431). In addition, the Army was developing a research reactor and a small power reactor (Marzo 1997: 35).

Due to the lack of IAEA safeguards on secret facilities (similar to the case of Argentina) and amid suspicions over the military's parallel programme, the international community assumed that Brazil was embarking on a covert nuclear weapons programme. Yet, as Lamazière and Jaguaribe (two Brazilian diplomats) made clear,

> At no stage was there a government directive to build nuclear weapons in Brazil. The sensitivity of the programme, the central role played by the armed forces, the absence of an internal safeguards system and the relative independence of several subprogrammes, however, were elements that gave room for speculation (1992: 111).[98]

[98] At the time of writing their article in 1992, Georges Lamazière was an Adviser to the Secretary-General for Foreign Policy of the Ministry of External Relations of Brazil, and Roberto Jaguaribe was the Head of the Division of International Trade in Advanced Technology of the Ministry of External Relations of Brazil.

Despite its ambitious goals, the Brazilian nuclear programme encountered problems. The Angra-1 reactor was prone to failure in that it became an unreliable source of electricity (Goldemberg and Feiveson 1994: 13). Construction of Angra-2 and -3 fell behind schedule and over budget (Reiss 1995: 56). Due to the economic downturn in Brazil, President Sarney cancelled the purchase of the remaining six reactors from West Germany (Spector and Smith 1990: 243). The Becker nozzle technology proved unworkable in practice (Squassoni and Fite 2005: 16). The Resende reprocessing plant was postponed indefinitely, and only the first stage of the Resende uranium enrichment facility was scheduled for completion (Spector and Smith 1990: 243). The "parallel" programme too was troubled in that the Aramar and IPEN facilities had produced miniscule quantities of low-enriched uranium (Reiss 1995: 56).

4.2 Nuclear Rivalry for Prestige

Argentina and Brazil's competition for a leading role in Latin America has been noted in every study available on their nuclear rapprochement. As the two major industrial, economic, and military powers in the Southern Cone, their relationship has been marked by a strong rivalry. Argentina and Brazil's attempts to acquire the nuclear fuel cycle can therefore be viewed as yet another competition between the two longstanding rivals. Many interviewees remarked on the nature of the Argentine-Brazilian relationship calling it "a competitive rivalry, and not an enmity".[99] As an Argentine diplomat remarked, "Argentina and Brazil were like two brothers: one wanted to be better than the other". In addition, the same diplomat mentioned that "there was no real tension between Argentina and Brazil. Both were striving for technological and indigenous superiority" (Interview F).

[99] This quote is attributed to Interview D. Other interviewees who remarked on the rivalry include Interview F, Interview G, Interview H, Interview L, and Interview S.

Historically, the Argentine-Brazilian rivalry was generally confined to political and economic issues (Courtney 1980: 241). In the political realm, tensions between both nations were shrouded in Perón's vision of unity among Latin America's Spanish-speaking populations and in Argentina's pursuit of regional leadership (Courtney 1980: 253). Their rivalry can be interpreted as a continuation of Spanish-Portuguese competition for the domination of Latin America during the colonial period (Stanley 1992: 201). In the economic realm, Argentina and Brazil competed for regional raw materials, energy, and markets (Resende-Santos 2002: 95).

As noted earlier, the rivalry was not military, yet it did develop a distinct nuclear dimension which could have achieved a military dimension. The fear of war between the two nations had reached a high point in the 1960s and 1970s, when leading military officials in both countries embraced "zero-sum 'geo-political' doctrines" (Knopf 2003: 201, Selcher 1985: 26–8, 39, Carasales 1992a: 47–8, Hurrell 1998: 230–34). However, since neither side had ever seen each other as enemies, they had never envisioned a nuclear war with one another (Reiss 1995: 52). Their nuclear rivalry, therefore, was mainly status driven, with both sides claiming that if the rival country were to build the bomb, the other would follow suit (Stanley 1992: 201, Redick 1997: 13, Resende-Santos 2002: 95). For example, an April 1980 *Washington Post* Editorial opined,

> The two nations have an intensely competitive relationship, and it is hard to believe that advances in one nation's nuclear program will not spur a matching response in the other's (6 April 1980: E6).

Since both states were vying for regional leadership, whoever acquired the nuclear fuel cycle first would be the "winner". While both sides were aware that each state wanted to acquire the fuel cycle, they were uncertain of the other's nuclear intentions: were the nuclear programmes for civilian or military purposes? In fact, as one Argentine scientist remarked, "Both governments thought the other government was

acquiring the technology at least to have the materials to produce the bomb" (Interview H).

Brazil's road to nuclear technological autonomy had the potential of being quicker and more productive than Argentina's. But Brazil's lack of ideological and political consensus and continuity regarding nuclear policy and the resulting institutional decentralisation hampered its efforts. Brazil lacked the consistency and continuation of a sole atomic energy commission seen in Argentina. In addition, Brazil often tried to play "catch-up" with its regional rival. For example, when Argentina announced the development of an indigenous method for enriching uranium, "Brazil doubled its efforts to do likewise" (Adler 1987: 317). That is not to say that the rivalry was one-sided. It has been argued that Argentina began the Pilcaniyeu project and the construction of the Ezeiza reprocessing plant (thus obtaining the entire nuclear fuel cycle), as a direct response to Brazil's 1975 nuclear deal with West Germany (Spector and Smith 1990: 387). In fact, the then head of the Argentine Nuclear Energy Commission acknowledged to one Carter Administration non-proliferation aide that

> Argentina could not abandon the Ezeiza plant – the only plant that Argentina had publicly announced at the time – *because* of [italics are added for emphasis] the 1975 Brazilian deal" (Spector and Smith 1990: 387).

By the end of the 1970s, the nuclear programmes in both Argentina and Brazil encountered many technical and financial obstacles, mainly due to the newly created Nuclear Suppliers Group (NSG). Established after India's nuclear test in 1974, the NSG ensures that nuclear transfers for peaceful purposes are not diverted to unsafeguarded nuclear fuel cycle of nuclear explosive activities. India's test demonstrated that nuclear technology transferred for peaceful purposes could be misused. Argentina and Brazil viewed the NSG as an attempt by the "major nuclear powers" to "freeze" world power into two categories – the nuclear-weapon haves, and the nuclear-weapon have-nots – and to create a monopoly in nuclear technology so as to constrain technological development

in the non-nuclear-weapon countries (Goldemberg and Feiveson 1994: 12, Wrobel 1996: 337, 341, Carasales 1999: 5). As a former Head of International Affairs for CNEA explained in an interview,

> All of this resulted in strong political pressure by western governments and the imposition of severe restrictions being put upon the transferring of technology, goods, equipment and services by nuclear providers. This affected Brazil and Argentina equally (Interview K).

Interestingly, in spite of their competition within the nuclear sphere, throughout the 1960s and 1970s, both states began to develop a common position and a shared hostility towards the international nuclear non-proliferation regime.

4.3 The Evolution of a Common Position against the Nuclear Non-Proliferation Regime: "Disarmament of the Disarmed"

Argentina and Brazil's objections to the international nuclear non-proliferation regime focused on the Treaty of Tlatelolco, the NPT, and the NSG. Their main objection to these international non-proliferation agreements was that they were considered a violation of their national interests and national sovereignty. However, in spite of their rivalry, common ground was being reached in relation to these non-proliferation agreements since both nations found themselves to be in agreement over their objections to the non-proliferation regime. It can therefore be argued that the Treaty of Tlatelolco and the negotiations surrounding the NPT set the political context for the Argentine-Brazilian nuclear rapprochement and agreements of 20 years later. These agreements proved to be very important to what emerged as a bilateral relationship between the two states. Redick notes (italics are added for emphasis),

> For the first time during the negotiations of the Latin American Treaty, these two suspicious rivals began to talk about these sensitive nuclear issues and *develop common* positions. The Tlatelolco negotiations became the first step in a long confidence-building process between Argentina and Brazil. The two countries were *now on the same side* of this nuclear policy issue. They saw themselves as pitted against the nonproliferation regime, which they viewed as insidiously trying to prevent the development of their nuclear programs. They viewed the nonproliferation regime as highly discriminatory. They viewed their *shared interest* as extending into common positions in opposition to the NPT, and this evolved

> into *common support* for each other's nuclear export policies. […] Their nuclear relationship deepened with parallel opposition to the NPT and the Nuclear Suppliers' Group, and in opposition to foreign efforts to prevent their access to sensitive technology. But then this traditional animosity became muted into a sense of *shared victimization* by the advanced nations (1996: 12–14).

What occurred over time was the change from a largely reactive policy to a perceived and real foreign pressure to active, bilateral nuclear cooperation, which then led to eventual involvement within the nuclear non-proliferation regime.

Treaty of Tlatelolco

Argentina and Brazil's main opposition to the 1967 Treaty of Tlatelolco concerned the interpretation of the application of peaceful nuclear explosions (PNEs). This treaty established the Latin American nuclear weapon free zone, with all parties to the agreement committing to use nuclear materials and facilities exclusively for peaceful purposes.[100] PNEs were viewed as a transparent cover for a desire to build nuclear weapons (Hymans 2006: 161). Since PNEs release energy in an uncontrolled manner and possess characteristics that make them useful for warlike purposes, they can be misinterpreted as nuclear weapons. The only difference between a PNE and a nuclear weapon is their employment (Costanzo 1998: 111). As a result, in the view of certain governments (particularly the U.S., Mexico, and other Latin American states), the Tlatelolco Treaty prohibited the manufacture and use of PNEs (Aja Espil 1985: 76).

Even though most Tlatelolco signatories shared the view that PNEs were not permitted under the Treaty, Argentina and Brazil insisted on maintaining the right to manufacture nuclear explosive devises for peaceful purposes. Argentina and Brazil wanted to leave open the possibility for the development of nuclear explosive devices (for peace *or* defence) should a national security need arise (Redick 1981: 121–122; 1995:

[100] The creation of the treaty was a means to protect the region after the events of the 1962 Cuban Missile Crisis (Redick 1981: 109–110, Davies 2004: 57).

16–19). Both nations maintained their advocacy of PNEs until 1990, at which point, they jointly declared their support of a ban on all nuclear testing (Redick 1995: 17).[101]

NPT

Argentina and Brazil's vehement opposition towards the NPT can be best surmised by Argentine Foreign Minister Rear Admiral Oscar Montes' speech to the First Special Session of the UN General Assembly on Disarmament in 1978. He said,

> From the beginning, we rejected the NPT because of its discriminatory character, since, for the first time in history, it legitimised a division of the world into two categories: countries which can do anything as regards nuclear affairs and countries which have their rights curtailed. (UN General Assembly, X Special Session, 5th plenary meeting, 26 May 1978, quoted in Carasales 1996: 326).

Argentina and Brazil found the treaty, on the one hand, unjust and discriminatory, and on the other hand, insufficient in providing appropriate security guarantees by nuclear weapon states to non nuclear weapon states. In their eyes, the NPT was seen as producing two classes of nations. The first class was comprised of the five recognised nuclear weapons states (NWS) who had the right to possess nuclear weapons, whose vertical proliferation was not prohibited, and whose nuclear activities were not safeguarded. The second class, the non-nuclear weapons states (NNWS), comprised all other nations that were prevented from obtaining them and whose nuclear activities were safeguarded. The nuclear weapons club represented the developed world and, as such, atomic energy and weapons were perceived as belonging to an unjust international order that was impeding the economic and technological development of the developing world. For Argentina and Brazil, both of whom viewed themselves as dependent on advanced industrialised countries and victims of an unjust international order, acquiring nuclear capabilities would bring them one step closer to having their ambitions as regional and

[101] Today, Argentina and Brazil support a comprehensive test ban agreement and have rejected PNEs as part of their 1991 bilateral nuclear agreement (Redick 1995: 17).

global leaders realised as well as being self-sufficient. In fact, military officers, scientific advisors, diplomats and mid-rank government officials in both countries all shared the view that "there existed a concerted international effort to deny less developed countries the means for economic improvement" (Wrobel and Redick 1998: 173). The Argentine and Brazilian view on non-proliferation was that

> Whereas non-proliferation of nuclear weapons is a matter of universal concern, measures of disarmament must be consistent with the inalienable rights of all states to develop, acquire and use nuclear technology according to their priorities, interests and needs, including explosions for peaceful purposes (Aja Espil 1985: 76).

Argentina and Brazil's disdain towards the NPT stemmed from their belief that the treaty was a continuation of an unjust international order designed to exploit developing countries.[102] The most widely reiterated Argentine and Brazilian statement in relation to the NPT – "disarmament of the disarmed" – was first articulated in 1968 by Argentine ambassador to the United Nations, José María Ruda:

> We realise that it is not easy to find final formulas in the treaty for problems that have been under discussion for three years; at the same time, however, the major nuclear powers should understand that the sacrifice to be made by the non-nuclear weapon countries under the system of the treaty is extremely high, without their receiving sufficient assurances that would hold out the prospects of a more promising future for the maintenance of international peace and security. Despite this advance in the field of horizontal non-proliferation, there is no indication at this time that would allow us to assume there will be a reduction in the arms race among those who possess the most weapons. Paradoxically, this treaty is for the disarmament of the disarmed (UN document A/C.I/PV./1572, quoted in Aja Espil 1985: 73–74).[103]

The "disarmament of the disarmed" label was arguably the defining statement made in relation to the NPT by Argentines because over 40 years later, it was used in an interview with an Argentine diplomat who explained,

> As Argentina considered the NPT a discriminatory treaty by creating two categories of states (NWS AND NNWS), convinced as we were and still are that no state should have nuclear weapons, we did not sign it [...] as we considered there was no reason why we should do something other states did not have the

[102] Wrobel, a Brazilian diplomat, wrote that many nations have viewed the NPT "as a way to freeze an unequal world order" (1996: 337).
[103] This was said in the 1968 UN debate on the NPT. In addition, Ambassador Ruda stated, "Argentina could not accept remaining subject to a continuing dependence on the great powers for nuclear technology" (quoted in Serrano 1994: 236).

> obligation to do. […] We used to call the NPT regime one which demanded the disarmament of the disarmed, as in reality it was mainly directed to avoid that those who had no nuclear weapons could acquire them while those who had them kept their arsenals growing (Interview O).

Brazil's official position towards the NPT was similar to that of Argentina. The attitude of many Brazilians regarding the NPT was summarised by J.A. de Araujo Castro, a prominent diplomat, in a speech at the Brazilian National War College:

> Brazil has sought to characterise what is now clearly looming as a firm and undisguised trend towards the freezing of world power. [...] The NPT [...] is the main instrument of this policy of freezing of World Power. [...] The Treaty [...] established distinctive categories of nations: one comprising weak and therefore non-adult and non-responsible countries. Contrary to all historical evidence, the Treaty starts from the premise that prudence and moderation are built-in features of power. It institutionalises inequality between nations and apparently accepts the premises that the strong countries will become even stronger and the weak will grow even weaker (quoted in Rosenbaum 1975: 268).

One of the most comprehensive Brazilian statements on the NPT was outlined in a 1977 White Paper. In it, Brazilian President General Ernesto Geisel, outlined his country's main objections towards the Treaty:

> The NPT seeks to legitimise a distribution of power which is unacceptable, because it results from the stage at which States found themselves at the date of its signature, as regards the application of nuclear weapons technology. As a result of this stratification, the Treaty requires strict control by the IAEA over the dissemination of the peaceful uses of the atom while, in relation to the nuclear weapon countries, no barrier is erected to the vertical proliferation of nuclear armaments, as evidenced by the growth and sophistication of their nuclear weaponry. Additionally, as far as security is concerned, the NPT does not provide for any efficient system of protection for non-nuclear weapon countries.
>
> […]
>
> The true sense of non-proliferation is to ban the diffusion of nuclear weapons, not the dissemination of nuclear technology for the benefit of Man. Given adequate controls, the access to the technology for the peaceful uses of nuclear energy should not be subjected to discriminatory restrictions, whether between nuclear weapon and non-nuclear weapon countries or among non-nuclear weapon countries themselves (O Programa Nuclear Brasileño, 1977 quoted in Goldemberg 1985: 81–82).

Based on the above, it is clear that Argentina and Brazil were hostile to the international nuclear non-proliferation regime. They felt marginalised from the nuclear-weapons club and the international order, and wanted to become global powers. At that

time, power was synonymous with technological autonomy, which both nations desired to acquire. Against the backdrop of their intense nuclear rivalry, common positions taken against the non-proliferation regime began to emerge. It was in this context in which the shared interests between Argentina and Brazil surfaced.

4.4 Reversing Course towards a Nuclear Partnership

During the Tlatelolco and NPT negotiations (mid-late 1960s – mid 1970s), in spite of emerging common positions taken against the non-proliferation regime, both states still considered each other as rivals and competitors. Sharing beliefs and having common positions might have been acceptable, but discussing the issue of bilateral nuclear cooperation (the essence of ABACC) was most probably objectionable. That is not to say that the issue of nuclear cooperation was never raised during these early years. Retired Argentine General Juan Gugliamelli, an influential military strategist, repeatedly stressed nuclear consultation and technical cooperation in the military journal *Estrategia* in the late 1960s and early 1970s (Redick 1981: 130).[104] In fact, writing in 1976, he explained

> [It] Makes it worthwhile to reiterate now, and in more serious circumstances, the thesis that we advanced at the end of 1974: negotiate with Brazil, within global discussions, an agreement for information, consultation and eventual technical cooperation in the nuclear field (1976: 165).

The unstable domestic situation in Argentina made progress difficult, but in 1976, at the 20th IAEA General Assembly Conference in Rio de Janeiro, Brazilian officials reportedly accepted the idea of bilateral nuclear cooperation as "a tentative but desirable future goal" (Redick 1981: 130). In addition, over the years, their nuclear policies converged into a common front against a common enemy (i.e., the non-proliferation regime), which was increasingly viewed as an imposed nuclear order threatening their independence and

[104] Guglialmelli, editor of the highly influential *Estrategia*, an independent review of geopolitics, wrote that the need for a balance within the Southern Cone was secondary to the need for the two states to join *together* to break down the international structural obstacles to their development. In 1970, he wrote that Argentina should take at its "basic thesis… that the national interests of both countries coincides in

development goals (Redick 1994: 5; 1995: 19, Reiss 1995: 53). These led to nuclear talks occurring between the two countries in January 1977, when the Argentine and Brazilian foreign ministers (Cesar Augusto Guzetti and Azeredo da Silveira, respectively) released a joint communiqué – their first – stressing the importance of nuclear policy cooperation and the initiation of systematic technological exchanges between the two countries' respective nuclear energy commissions (Redick 1981: 130; 1995: 20, Doyle 1999: 4, Davies 2004: 58).[105]

This was a very important opening as it marked the origins of highly significant bilateral agreements, which established technological and political cooperation throughout the 1980s.[106] In 1979, a treaty was signed which resolved the long-standing territorial disputes around the La Plata river basin.[107] A year later, in May 1980, Brazil's military leader, General João Figueiredo, visited Buenos Aires – a hugely symbolic gesture, since he was the first Brazilian president to do so in 40 years – and signed agreements covering the peaceful uses of nuclear energy and joint nuclear research and development plans.[108] This was the first time that nuclear cooperation was on the agenda (Reiss 1995: 53). In an interview, a former Head of International Affairs for CNEA, explained,

> In this situation [Argentina and Brazil suspected of pursuing a nuclear arms race], what could have been a more logical conclusion by the two governments than to make their respective images in the nuclear field more transparent, demonstrating to the international community the lack of foundations behind accusations of the development of a nuclear arms race in amongst the establishment of a strong nexus of cooperation between both of them in this field and opening their respective nuclear installations at the same time? This is

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supporting their respective national development [efforts]. Both interests, before being contradictory, are coinciding" (quoted in Hymans 2006: 162).

[105] Serrano explains that Argentina's official statements condemning U.S. policies and stating publicly Argentina's interest in establishing a common front to resist U.S. opposition to the construction of enrichment plants were warmly received in Brasilia. These declarations were followed by the joint communiqué (1994: 251, fn 25).

[106] Appendix V details Argentina and Brazil's nuclear cooperation agreements and declarations.

[107] The 19 October 1979 agreement, signed between Argentina, Brazil, and Paraguay, resolved the Corpus-Itaipú dam dispute (1966–1979). The dispute was over the use of water resources and the construction of a hydroelectric dam on the Paraná River that flows from Brazil into Argentina (Redick 1995: 20).

[108] Interview D remarked that President Figueiredo went to Buenos Aires because his father had been in exile there many years before, and he wanted to visit the place where his father had been.

> how the start of the "Agreement of Cooperation between the Republic of Argentina and the Federal Republic of Brazil for the Development and Application of Peaceful Uses of Nuclear Energy" was born, signed in Buenos Aires on 17 May 1980 (Interview K).

By 1980, the issue of nuclear cooperation between Argentina and Brazil was established, paving the way towards their eventual rapprochement. It can be argued that their eventual nuclear rapprochement was guided, in part, by their shared hostility towards the international nuclear non-proliferation regime. Moreover, their mutual antagonism towards the non-proliferation regime facilitated the process of nuclear cooperation, which helped to end their competitiveness. Under these conditions, from the 1960s to the early 1980s, an epistemic community began to develop.

4.5 Shared Ideas and Similarities: The Emergence of an Argentine-Brazilian Epistemic Community

While the analysis of this case study focuses on the role of an epistemic community behind the creation of ABACC from 1980–1991, it is important to reflect on the pre–1980 period in order to understand how an epistemic community that was involved in the creation of ABACC emerged. Based on my understanding and research on the creation of ABACC, the epistemic community that was involved in the creation of ABACC was born out of an incipient epistemic community that had began to develop during the 1965–1980 period. That is not to say that the epistemic communities were one and the same. Rather, the incipient epistemic community had started to develop in the 1965–1980 period based on Argentine and Brazilian common positions taken against the international nuclear non-proliferation regime, that by the 1980–1991 period, it had realigned in ways that made a process of cooperation, and by extension, ABACC, possible.

During the 1965–1980 period, even though Argentina and Brazil were competing against each other, particularly in the nuclear realm, common ground was being reached in relation to the international nuclear non-proliferation regime. Their emerging nuclear

cooperation was bolstered by Argentina's quiet reaction and the U.S.'s angered reaction to the West Germany-Brazil deal. Buenos Aires had not publicly criticised the deal when it was first announced; in fact, Argentine civilian officials and military officers had defended Brazil's right to acquire nuclear technology (Reiss 1995: 53). Such support reinforced Argentina's common cause with Brazil "against the hierarchy of the global non-proliferation regime" (Reiss 1995: 54). As Redick, Carasales, and Wrobel explain, "As U.S.-Brazilian relations worsened over nuclear relations, Argentine-Brazilian nuclear policy collaboration advanced" (1995: 110).

Over the subsequent 20 years, these common positions evolved into a process of cooperation, in which mutual interests (e.g., regional confidence-building measures) were shared, eventually leading to the establishment of ABACC, the acceptance of full-scope IAEA safeguards, full membership in an amended Tlatelolco Treaty, and NPT ratification. The evidence from this case study analysis indicates that the process of cooperation, specifically the idea behind ABACC, was facilitated by an epistemic community that had realigned itself from that of the developing epistemic community from the 1965–1980 period. Consequently, it is important to reflect on how the developing epistemic community emerged.

The emergence of an Argentine-Brazilian epistemic community can be traced back to the mid 1960s, when Argentine and Brazilian diplomats participated in many international organisations and in various negotiating fora (including the IAEA Board of Governors and the UN Conference on Disarmament). In these surroundings, Argentine and Brazilian diplomats found themselves on similar grounds regarding the non-proliferation regime (Redick 1981; 1988; 1990, Alcañiz 2004, Hymans 2006).[109] In particular, the negotiations surrounding the Tlatelolco Treaty helped set the political

[109] It should be noted that Argentina and Brazil appointed *joint* representatives to the IAEA in the late 1950s (Serrano 1994: 241).

context for the emergence of an epistemic community. The Tlatelolco negotiations in the early 1960s encouraged the two nations to begin to discuss and develop common positions on sensitive nuclear issues. In these negotiations, the nuclear representatives of the two states increasingly found their positions aligned and contrary to the views of the majority of Latin American nations (Redick 1981: 105). Argentina and Brazil became united in working towards stiffening the ratification procedures and in developing a common position on peaceful nuclear explosives since

> The shared objective of the two countries became the mitigation of the more restrictive elements of Tlatelolco and preservation of the independence of their nuclear programs from regional or international constraints (Redick, Carasales, and Wrobel 1995: 110).

For many years following the completion of the Tlatelolco negotiations, these common positions were limited to a shared opposition to a "perceived" unequal and discriminatory non-proliferation regime (Redick 1997: 12). Argentine and Brazilian diplomats jointly condemned the discriminatory nature of the non-proliferation regime. For example, the Brazilian opposition to the NPT was reconfirmed in a communication received in 1971 from the Brazilian Ambassador in Stockholm:

> Brazil considers the Treaty incompatible with the interests of her economic development and her national security. The restrictions that the Treaty imposes on the development of nuclear technology for peaceful purposes by the militarily "non-nuclear" countries are unacceptable. The treaty does not provide any guarantee for the security of the non-nuclear countries against an attack or a threat of aggression with nuclear weapons, nor does it create any kind of actual engagement, on the part of the nuclear powers, that they will proceed to their own partial or total nuclear disarmament. To sum up, the treaty does not establish an acceptable balance between the rights and obligations of nuclear and non-nuclear countries. (Communication received from the Brazilian Ambassador, Stockholm, 11 June 1971, quoted in Hirdman et al. 1972: 49–50).

Similar to the Brazilian position, a more explicit set of criticisms was set out by the Argentine government in April 1978:

> The NPT is an intrinsically discriminatory Treaty since it recognises different rights and obligations for signatory nations depending on whether, at the time of signature, they have demonstrated that they did or did not possess nuclear weaponry. It was the first time that a treaty had been drawn up which so explicitly contravened a basic principle of international co-existence, namely the legal equality of all states. Even more so, however, the treaty does not offer a

> guarantee to non-nuclear weapon states that they will not be threatened or attacked by the nuclear weapon states, nor does it permit explosions of nuclear devices for peaceful purposes; these remain reserved for an "elite" made up, as always, of the countries that possess nuclear weapons. Both these aspects accentuate the discriminatory nature of the Treaty. (Statement of the Argentine delegate to the VIIth General Conference of the Agency for the Prohibition of Nuclear Weapons in Latin America (OPANAL), Mexico City, April 1981, quoted in Aja Espil 1985: 74).[110]

Such proclamations fostered a shared understanding on nuclear development, which facilitated the emergence of a transnational network of professionals with shared normative and principled beliefs.

In addition to participation in international non-proliferation and disarmament fora, Argentina and Brazil engaged in joint scientific and technical research from as early as the 1950s. Interview J – an Argentine scientist from *Autoridad Regulatoria Nuclear* (Argentina's Nuclear Regulatory Authority) – remarked that Argentine and Brazilian nuclear cooperation "has a long history, even before 1980", since there were interactions from scientists from both states involved in technical engagements. This joint research brought together scientists from different academic institutions in Argentina and Brazil and from CNEA and CNEN and acted as one of the first steps towards confidence-building (Fabbri 2005: 109; 127). In addition, Interview J mentioned that there were interactions in Pugwash and other such international arenas.[111] In fact, during the pre-1980 period, there were six Pugwash meetings in which Argentine *and* Brazilian scientists were present.[112] However, it is not clear what the nature of these interactions was since

[110] Many interviewees remarked on the discriminatory nature of the NPT. For example, Interview J remarked that the NPT was discriminatory and that "it didn't work for Argentina or for Argentinean law". Interview O explained, "Argentina considered the NPT a discriminatory treaty [because] it created two categories of states, nuclear-weapon states, and non-nuclear-weapon states". Interview S said, "Argentina and Brazil were anti-NPT because of its discriminatory policy, and *not* because they wanted the bomb. U.S. and Europe thought Argentina and Brazil wanted the bomb because neither country would sign the NPT".

[111] The Pugwash Conferences on Science and World Affairs, founded in 1957, is an international organisation that brings together international influential scholars (particularly scientists) and public figures concerned with reducing the danger of armed conflict and seeking cooperative solutions for global problems.

[112] These meetings were held in (i) September 1968 (18th Pugwash Conference, "Current Problems of Peace, Security & Development", held in Nice, France, where Professor C. M. Varsavsky, from Argentina, and Professor Rodrigues, from Brazil, attended); (ii) September 1970 (11th Pugwash Symposium, "What Can Scientists Do for Development?" held in Stanford, CA, U.S.A. where Professor C. M. Varsavsky, from

Pugwash participants operate under the "Chatham House Rule".[113] Yet, it could be argued that these interactions provided the basis for what was to become a developing epistemic community of scientists (which later expanded to include government officials) arguing in favour of bilateral nuclear cooperation. Even before the formal bilateral exchanges, many Argentine nuclear scientists and technicians who had left CNEA in the mid-1970s – due to low salaries, political persecution, and deteriorating working conditions – had gone to work in Brazil (Reiss 1995: 54, Albright 1997: 41).[114]

Based on the above, it can be argued that shared similarities and shared ideas in relation to their nuclear programmes and the non-proliferation regime facilitated the emergence of an Argentine-Brazilian epistemic community. This is important to note because within the existing epistemic community literature, the consensus view has been that an epistemic community is more likely to emerge when decision makers are faced with uncertainty or complex policy issue areas and/or lack the expertise in a particular complex policy issue area (Haas 1992a). In addition, the literature indicates that if there is a change in government – i.e., if the state shifts from a dictatorship to a democracy, or if the state remains a democracy under the same ruling party, or if the state remains a

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Argentina, and Professor P. Kirschner, from Brazil, attended); (iii) August 1973 (18th Pugwash Symposium, "The Participation of Latin American Scientists in Development", held in Santa Maria del Mar, Peru, where Dr C. A. Mallmann, Professor E. Oteiza, Professor J. A. Sabato, from Argentina, and Professor O. Sala, Dr A. A. Leao, and Dr F. de Mendonca, from Brazil, attended); (iv) April 1974 (Workshop, "Code of Conduct on Transfer of Technology", held in Geneva, Switzerland, where Professor J. A. Sabato, from Argentina, and Mr A. G. de Alencar, from Brazil, attended); (v) June 1978 (32nd Pugwash Symposium, "Social Values & Technological Choice in an International Context", held in Racine, WI, U.S.A., where Dr C. A. Mallmann, from Argentina, and Professor J. Goldemberg, from Brazil, attended); and (vi) July 1979 (29th Pugwash Conference, "Development and Security", held in Mexico City, Mexico, where Professor J. A. Sabato, from Argentina, Dr S. Schwartzmann, Professor U. D'Ambrosio, and Professor M. Rocha-e-Silva, from Brazil, attended) Pugwash 2007.

[113] Professor John Finney (UK Head of Pugwash) explained this in a face to face conversation, 15 September 2009, London. The Chatham House Rule stipulates "When a meeting, or part thereof, is held under the Chatham House Rule, participants are free to use the information received, but neither the identity nor the affiliation of the speaker(s), nor that of any other participant, may be revealed" (1927, refined in 1992 and 2002: www.chathamhouse.org.uk/about/chathamhouserule/).

[114] Albright explained that he met scientists from Argentina who "fled the Argentine dictatorship and took professorships at Brazilian universities. The Argentine military decimated the universities. Indeed, it's not well appreciated, but the Argentine Atomic Energy Commission in Argentina became a safe haven for some scientists during the worst periods of repression in Argentina" (1997: 41, Wrobel and Redick: 1998: 174). Interview G explained that the scientific community were always against the military leaderships in Brazil and Argentina. "The list those murdered or disappeared was mostly scientists."

democracy under a different ruling party, or if the state suffers a change in national sovereignty – new governments might not have policy-making experience, and therefore might seek the advice of an epistemic community.

However, that is not to say that in the case of Argentina and Brazil, moments of uncertainty and complexity were absent. Indeed, these two conditions were constantly present, but they were not the facilitators of the emergence. Throughout the 1950s–1980s, Argentina and Brazil were faced with both uncertainties and with changes in government, as defined above. The uncertainties ranged from economic crises (including hyperinflation and massive unemployment), social crises (including human rights violations and disappearances of military/political opponents), and a possible nuclear crisis. These uncertainties were undoubtedly linked to the recurrent change in government, which are shown in Figures 1 and 2 in Appendix VIII. As the diagrams clarify, these changes (and subsequent uncertainties) were constant until the mid-1980s, when democracy was restored. However, against the backdrop of uncertainty and change in the Argentine and Brazilian governments, it can be argued that the similarities and shared ideas in relation to their nuclear programmes and the non-proliferation regime facilitated the emergence of an Argentine-Brazilian non-proliferation epistemic community.

Argentina and Brazil's shared similarities included competing for economic and political leadership in the Southern Cone, living under military dictatorships, transitioning to civilian democracies (and the subsequent decreasing role of the military), deterioration of their economies, and the fact that they had both made similar progress in their civilian nuclear programmes, having both developed uranium enrichment capability.[115] These

[115] Carasales (a former Argentine diplomat) argued that the most important similarity between the two nations was the presidential leadership. In a seminar on Argentina and Brazil's Rapprochement organised by the Washington-based Institute for Science and International Security (ISIS) and the Shalheveth Freir Center for Peace, Science, and Technology (Israel) held on May 16, 1996, he argued that the presidential leadership of both states was crucial "in breaking with longstanding policies and starting with a new one"

factors might have been expected to foster competition, but instead, in the case of Argentina and Brazil, it appears to have created cooperation. This is because of the shared ideas the two countries had. These included the determination to acquire technological autonomy in order to ensure energy independence, the right to engage in peaceful nuclear explosions, and resisting against the nuclear non-proliferation regime. These shared similarities and ideas paved the way for the two former rivals to establish a nuclear partnership.

4.6 Conclusion

This chapter has provided a detailed narrative in relation to Argentina and Brazil's suspected nuclear weapons programme. It analysed how their nuclear rivalry evolved into a common position taken against the international nuclear non-proliferation regime. Their mutual disdain towards the non-proliferation regime facilitated the process of nuclear cooperation. What is quite remarkable about the Argentine-Brazilian cooperation is the dates when it began. Their cooperation was initially developed during the 1965–1980 period, when both countries had already been longstanding regional rivals and were under military rule, and were operating ambitious civil nuclear programmes that could have become military. During this period, common positions regarding the non-proliferation regime were repeated, prompting the discovery of shared interests. It was under these conditions that an incipient epistemic community began to develop. The May 1980 Accord on Cooperation for the Development and Application for the Peaceful Uses of Nuclear Energy marked the first important steps not only towards nuclear rapprochement, but also towards establishing the incipient epistemic community. This opening strengthened personal relationships, reduced suspicions and misunderstandings,

(1996: 19). In addition, the leadership included active participation of key advisors, decision makers, and the fundamental role of both Foreign Ministries.

and built trust (Reiss 1995: 54). Most importantly though, it created the possibility for establishing an unprecedented bilateral nuclear inspections agency, which, as will be discussed in the next chapter, was conceived by an epistemic community.

Chapter Five

Examining the Influence of the Argentine-Brazilian Epistemic Community in the Creation of ABACC

> "I participated in a private conversation between Presidents Collor (Brazil) and Menem (Argentina) in Iguaçu (in the border of the two countries) in which the Argentinean President expressed similar views to ours (that nuclear weapons would not add security to a country which was not threatened; to develop nuclear weapons would – and was already – creating difficulties for the import from the U.S. of large computers and other sophisticated equipment needed by industry; and nuclear weapons would […] divert resources from what was considered essential which was to promote the development of the country), opening the way to the agreement that led to the creation of ABACC."
>
> (Interview E)

In this chapter, the process of how the policy behind ABACC was created is analysed. In particular, it investigates the role of an epistemic community in influencing its creation and its subsequent implementation as policy by Argentine and Brazilian decision makers. Since the first joint nuclear agreement of May 1980 to the policy which led to the creation of ABACC in July 1991, a total of ten nuclear cooperation agreements were signed between the two states. A close analysis of all the agreements reveals six common elements that were always included. These comprised a reaffirmation of the exclusively peaceful character of the Argentine and Brazilian nuclear programmes; a strengthening of mutual confidence (seen through initiatives such as joint projects, exchange of information, and reciprocal visits to secret nuclear facilities); advancing the peaceful uses of nuclear energy for the benefit of the population of both states; considering the potential for expanding cooperation in the nuclear field to other countries throughout Latin America; coordination of a common foreign policy in the nuclear energy sphere; and fostering concern for peace and security in the region (Carasales 1992: 76–77). It can be argued that these common elements – the *shared normative, principled, and causal beliefs* – facilitated closer nuclear cooperation between Argentina and Brazil.

Between 1980 and 1991, a common nuclear policy between Argentina and Brazil (which included confidence-building measures) began to emerge. It was through the establishment of a common nuclear policy that the idea of a mutual nuclear safeguards and bilateral inspections regime developed. Based on my research and understanding of the case, this idea was conceived by an epistemic community that was born out of the developing epistemic community discussed in the previous chapter, and had realigned in ways that made ABACC possible. Further, the epistemic community was given greater legitimacy when the 1985 Joint Declaration of Nuclear Policy established an ad-hoc Joint Working Group on nuclear issues (JWG), which by 1988 had been institutionalised as a Permanent Committee on Nuclear Affairs. The JWG/PCNA – the institutionalised epistemic community – was comprised predominately of Argentine and Brazilian scientists (including representatives from CNEA and CNEN – the nuclear energy commissions in both states) and government officials (including representatives from the foreign ministries). These experts frequently participated in periodic meetings where they engaged in a mutual exchange of information, regular scientific, technical, and military consultative exchanges, and participated in discussions surrounding the nature of the mutual safeguards system. It can be argued that they, in part, helped to change the Argentine-Brazilian nuclear relationship from one of rivalry to that of cooperation. Over the years, they stressed the importance of a bilateral mutual inspections regime, which would verify Argentina and Brazil's non-nuclear weapon status. Their proposals were adopted and implemented by the presidents of both Argentina and Brazil (Menem and Collor, respectively), culminating in the establishment of ABACC in December 1991. Soon after the creation of ABACC, Argentina and Brazil integrated into the non-proliferation regime, signing safeguard agreements with the IAEA, and signing both the Treaty of Tlateloloco and the NPT (illustrated in Table 5.1, p. 148).

The chapter is structured in three parts. The first section explains the evolution of the nuclear rapprochement throughout the 1980–1991 period. In addition, it focuses on the steps that led to the development of ABACC. The second section investigates to what extent an Argentine-Brazilian epistemic community facilitated the creation of ABACC. In this section, members of the epistemic community are defined, drawing on Haas' definition. The third section analyses the key influence mechanisms of the epistemic community, paying particular attention to the importance of the role of expertise and knowledge, and having access to decision makers. The chapter concludes with a discussion on recounting the importance of applying the epistemic community framework to an understanding of the creation behind ABACC.

5.1 The Road to ABACC

Based on my research and analysis, I argue that the creation of ABACC involved three distinct phases: (1) May 1980, (2) 1983–1989, and (3) 1990–1991. It is important to note that the 1980–1983 period was marked by a lull, given the broad international problems facing the two states. Argentina was preoccupied with the Malvinas/Falkland Islands War against the UK in 1982, and, at the same time, the Brazilian economy suffered a crisis. Phase one saw initial steps taken by the military governments of President Jorge Rafael Videla of Argentina and President Joâo Baptista de Oliveira Figeuiredo of Brazil in May 1980, when the Cooperative Agreement was signed between the two nations for the Development and Application of the Peaceful Uses of Nuclear Energy. Phase two saw these steps pursued and strengthened by the countries' first democratic governments when President Raúl Alfonsín of Argentina and President José Sarney of Brazil signed five nuclear cooperation agreements. Phase three brought the initial May 1980 steps to full conclusion by President Carlos Menem of Argentina (elected in 1989) and President

Fernando Collor de Mello (elected in 1990) – the successors of Alfonsín and Sarney.[116] Presidents Menem and Collor adjusted previous nuclear policies to align them with broader foreign policy objectives (Reiss 1995: 67) and signed a further four nuclear cooperation agreements, including the Guadalajara Agreement (18 July 1991), which established ABACC.[117]

May 1980

As explained in the previous chapter, the overture of Argentina and Brazil's nuclear partnership can be traced back to January 1977, when the Argentine and Brazilian foreign ministers released their first joint communiqué. In it, they stressed the importance of nuclear policy cooperation and the initiation of systematic technological exchanges between the two countries' respective nuclear energy commissions (Redick 1981: 130; 1995: 20, Doyle 1999: 4, Davies 2004: 58).[118] This was followed by Brazilian General Figueiredo's visit to Buenos Aires in May 1980 whereby Argentina and Brazil signed their first nuclear agreement. The May 1980 agreement promoted the peaceful uses of nuclear energy and encouraged joint nuclear research and development plans. It stated,

> The parties will pursue talks concerning situations of mutual interest which arise on the international scene in relation to the application of nuclear energy for peaceful purposes with a view to coordinating their positions when this is desirable (Agreement on Cooperation for the Development and Application of the Peaceful Uses of Nuclear Energy, May 1980).[119]

Further, the agreement helped to establish a common nuclear policy, which was defined as "cooperation in the use of nuclear energy" and the "development and application of the peaceful uses of nuclear energy" (May 1980 Agreement).

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[116] Appendix IV details Argentina and Brazil's governments from 1946–1995.
[117] Appendix V provides a complete list of Argentina and Brazil Nuclear Agreements from 1980–1991.
[118] The joint communiqué was a response to Brasilia's warm reception to Argentina's official statements condemning U.S. non-proliferation policies which opposed construction of enrichment plants (Serrano 1994: 251, fn 5).
[119] Excerpts from the May 1980 agreement can be found in Redick 1981: 130–131; 1994: 3–4, Serrano 1994: 238, Reiss 1995: 53.

In this accord, CNEA and CNEN reached agreement on a wide range of joint technical projects, including research and development on experimental and power reactors, exchange of nuclear materials, uranium prospecting, and the manufacture of fuel elements (Redick 1995: 53). It called for bilateral technical collaboration and joint ventures for the production of reactor components and fuel elements, with the aim of minimising dependence on western supplier countries (Paul 2000: 101). It is important to note that it was not an arms control agreement; instead, it called for "technical-scientific collaboration in nuclear research over ten years for the full nuclear combustion cycle, as well as commercial sales of material and equipment" (Resende-Santos 2002: 116).

The 1980 Agreement contemplated the creation of an organisation similar to the European Atomic Energy Community, EURATOM.[120] "SUDATOM" would enable both parties to jointly demand full access to nuclear technology in international fora, to carry out research and development, and to resolve eventual differences through the provision of control mechanisms (Serrano 1994: 251, fn 27). Even though the agreement did not offer an inspection regime, it offered verbal assurances and some limited technical cooperation between their respective atomic energy authorities (Hymans 2006: 161). It has been noted that through this agreement, "both sides took the first tentative steps towards a rudimentary mutual inspection and verification regime" (Resende-Santos 2002: 116). It was the first of many joint nuclear cooperation agreements which facilitated the nuclear rapprochement. Upon signing this agreement, Argentine President Jorge Videla remarked, "This should silence forever the legend that there is an arms race between Argentina and Brazil in the nuclear field" (quoted in Washington Post, 18 May 1980: 13).

[120] EURATOM was established on 25 March 1957. It was created to coordinate the former European Community's member states' research programmes for the peaceful uses of nuclear energy. It was a system of nuclear controls and inspection. In addition, it was the only other major regional nuclear agreement of this type at that time.

As a result of the agreement, Argentina leased uranium concentrate to Brazil and sold zircalloy tubing for nuclear fuel elements. In exchange, Brazil supplied Argentina with a portion of the pressure vessel for its Atucha II nuclear power generator (Reiss 1995: 53, fn 44). The stage was now set for Argentina and Brazil to continue cooperation on nuclear issues. However, even though the agreement did not put an end to the nuclear technology race, it did become

> The first major step towards a comprehensive nuclear regime based on proliferation restraint and mutual safeguards – a regime methodologically put together over the next decade (Resende-Santos 2002: 116).

Whilst the pursuit of talks was encouraged in the agreement, talks were not pursued until 1985 due to the more pressing agendas facing Argentina and Brazil, alluded to above.

1983–1989

During the 1983–1989 period, the process leading to nuclear rapprochement intensified, in part due to both countries' transition to democracy (Argentina in 1983, Brazil in 1985). The countries' first democratic governments (President Raúl Alfonsín of Argentina and President José Sarney of Brazil) strengthened their nuclear partnership and established a common nuclear policy with the signing of five nuclear cooperation agreements, which included the agreements creating the ad-hoc Joint Working Group on Nuclear Affairs (JWG) and its more permanent successor, the Permanent Committee on Nuclear Affairs (PCNA). Through these agreements, both presidents were keen to prove to each other and to the rest of the international community that their nuclear programmes were of a peaceful nature. It is important to note that during this period, official negotiations of a mutual safeguards inspection regime began (1987).

With the defeat of the Malvinas/Falklands War, Argentina's military leadership ended and was replaced by the democratic election of President Alfonsín in 1983. During this period, Argentine and Brazilian scientists began calling for bilateral nuclear

cooperation and mutual inspections. For example, in November 1983, the Brazilian Physics Society (SBF) and the Argentine Physics Association (AFA) issued their first joint declaration which contained a paragraph asking both governments to exchange nuclear information and to establish mutual inspections of nuclear facilities. In addition, the declaration contained statements about opposing an arms race in South America and about the necessity for nuclear disarmament (Wrobel and Redick 1998: 176). For the first time, both physics societies began to share the view that some (bi)national control over their respective nuclear programmes was desirable, and that they should work together to establish this objective (Wrobel and Redick 1998: 176). In the following year, in November 1984, the two physics societies released a further joint declaration stating their opposition towards nuclear weapons, considering "morally unacceptable the participation of physicists in the development of nuclear weapons" (quoted in Fabbri 2005: 175).[121]

In late 1984, Argentine President Alfonsín decided to take advantage of the incoming civilian administration in Brazil by proposing discussions on nuclear issues. Discussions at the Foreign Minister level led to a meeting in February 1985 between President Alfonsín and Brazilian President-Elect Tancredo Neves, which resulted in the two Presidents agreeing to strengthen the 1980 accord to include eventual mutual inspection of each other's nuclear facilities (Redick 1988: 4). The death of Neves only temporarily slowed down the momentum for nuclear cooperation; nine months later, in November 1985, newly appointed Brazilian President Sarney and President Alfonsín announced a Joint Declaration of Nuclear Policy. In this agreement, the common nuclear policy was defined as "close cooperation in all the peaceful applications of nuclear energy

[121] Official statements were circulated simultaneously by both societies in Rio de Janeiro and Buenos Aires. This declaration was released in a meeting of the Latin American Federation of the Physics Societies (Federación Latino-Americana de Sociedades de Física) held in São Paulo, Brazil. The declaration was submitted jointly by the societies of Argentina, Brazil, and Mexico in favour of nuclear disarmament and mutual controls in Latin America and the Caribbean (Wrobel and Redick 1998: 176).

and of supplementing each other on issues that, reciprocally, they deem convenient to agree" (November 1985 Joint Declaration on Nuclear Policy, Foz de Iguaçu).

Further, the agreement called for the creation of a JWG on nuclear issues. This group was to be established

> Under the responsibility of the Brazilian and Argentine Chancelleries [i.e., the foreign ministries], membered by representatives of the respective Nuclear Commissions and companies, aimed at fostering the relations between both countries in this [nuclear] area, at promoting their technical and nuclear development of nuclear energy and at creating mechanisms that assure the preeminent interest of peace, security, and development of the region (November 1985 Joint Declaration on Nuclear Policy, Iguaçu).

The JWG included representatives from the nuclear energy commissions (including the presidents), government agencies (including the foreign ministries and disarmament officials), and prominent scientists. The JWG was divided into three subgroups concerned with the following policy areas: technical cooperation; foreign policy coordination to promote shared nuclear diplomacy in multilateral fora; and legal and technical requirements for cooperation, including patents, legal and political issues, and the design of mechanisms for mutual safeguards systems (Fabbri 2005: 147, Barletta 2000: 165, fn9). In addition, arrangements were made for meetings between the representatives of the Argentine and Brazilian nuclear industries to run alongside the meetings of the JWG, and for such representatives to submit regular reports to the JWG (Fabbri 2005: 147, Barletta 2000: 165, fn9).

According to an Argentine representative from the JWG/PCNA, the JWG, which met every 120 days (as mandated in the agreement) was "tasked to supervise the progress of the technical cooperation of the protocols that were in agreement, increase transparency mechanisms, help facilitate the joint visits, and create an accountable state system of control" (Interview J). The main activities of the working group were dialogue, information exchange, and consultation (Wrobel 1999: 142). At its first meeting in March 1986, the JWG engaged in discussions over the necessity to work towards establishing a

joint inspection regime, but insisted that information derived from the inspections should be kept binationally and should not be shared with the IAEA (Redick 1988: 5–9).

The 1985 Foz de Iguaçu agreement was followed by the 1986 Joint Declaration on Nuclear Policy signed in Brasilia. This declaration stressed the decision to increase reciprocal technical visits and consultations and continue to share information on nuclear technological developments and radiological security and protection. It also called for strengthening the coordination of policy positions before international fora to defend common interests and protect the region from the risk of nuclear weapons (Fabbri 2005: 149).

From 1987, the high-level Presidential and technical reciprocal visits to unsafeguarded and sensitive nuclear facilities began. Both the visits and the subsequent nuclear accords played a decisive role in assuring each other and the international community that their nuclear programmes were of a peaceful nature. It is important to note that all the presidential visits were followed by visits of specialised technical personnel, which represented another step towards nuclear transparency. In July 1987, the first of such visits occurred when President Sarney, accompanied by 15 officials from the Brazilian diplomatic and nuclear establishment, upon an invitation by President Alfonsín, was given an exclusive tour of Argentina's unsafeguarded Pilcaniyeu pilot uranium enrichment facility.[122] Until then, Argentina had not publically admitted that this facility existed.

The visit culminated with the Viedma joint declaration on nuclear policy, which emphasised Sarney's historical visit as promoting "mutual confidence […] within the framework of the immovable commitment made by both nations to use nuclear energy exclusively for peaceful purposes" (July 1987 Joint Declaration, Viedma). Further, the

[122] It should be noted that prior to this Presidential visit, in November 1986, Argentinean CNEA scientists were given a tour of Brazil's unsafeguarded gas centrifuge enrichment facility (IPEN), operated by the Brazilian navy at the University of São Paulo (Redick 1988: 7).

common nuclear policy was defined as "(1) ending any secrecy surrounding their nuclear programmes and (2) continue to deepen their cooperation" (Joint Declaration on Nuclear Policy, Viedma). The joint statement served to reassure both the domestic and international community about the peaceful purposes of their nuclear programme.

Argentine and Brazilian spokesmen described Sarney's first visit to Argentina's unsafeguarded Pilcaniyeu pilot uranium enrichment facility in July 1987 as part of an "action-reaction process" that would eventually make their nuclear programmes transparent to each other (Redick 1988: 7). Transparency and confidence building were arguably acquired on that first high-level visit because according to a Brazilian scientist, who was part of the delegation,

> To our surprise, when we went to the facility, we asked a lot of questions and the Argentines answered all of them. We visited the whole facility. They showed us more than plans. We could see at that time the factory where the diffusion barriers were manufactured. This technology is very secret. This step was very important for confidence building not only between the two countries in general but also among the technical people involved in nuclear activities (Marzo 1997: 35).

This was a very important accomplishment given that when the nuclear delegations of Argentina and Brazil met for the first time a couple of years earlier during the JWG meetings, they were "deeply suspicious" (Interview G). A Brazilian scientist who was part of the nuclear delegation explained that when the Brazilian nuclear delegation asked the Argentines their questions, Brazil was "shocked by Argentina's openness as information was given on top secret sites" (Interview G).

In response to President Alfonsín's invitation to visit Argentina's enrichment plant, in April 1988 (nine months after Alfonsín's invitation), President Sarney invited Alfonsín to the navy-controlled Aramar uranium enrichment facility in the Iperó nuclear complex, São Paulo. Similar to the Pilcaniyeu pilot uranium enrichment facility in Argentina, the Aramar uranium enrichment facility had served as a secret nuclear installation (Marzo 1997: 36). As the first foreigner to visit the plant (Fabbri 2005: 150),

this invitation was very symbolic. At this visit, a Brazilian scientist who was part of the delegation explained,

> At that time, the centrifuge machines were not concealed from the visitors. This is very important: the Quadripartite Agreement [of 1991] gives each country the right to protect technological secrets, and the centrifuges are now covered during inspections. But in 1988, the machines were uncovered. The Argentines visited the facility and they asked many questions. This was also a very important confidence building measure (Marzo 1997: 36).

During this visit, the presidents released another declaration – the Iperó joint statement – which continued the process of building mutual trust and assuring each other and the international community that their nuclear programmes were of a peaceful nature. Furthermore, the Iperó joint statement announced the decision to turn the JWG into a PCNA, institutionalising the former ad-hoc joint working group into a permanent body (a high-level group) "with the objective of undertaking and coordinating activities in the political, technical, and entrepreneurial areas of the nuclear sector" (1988 Joint Declaration on Nuclear Policy, Iperó).

The PCNA would establish,

> A close political contact, the various joint projects and the fluent exchange of information, experiences, and technical visits, as a means to ensure the definite enhancement of the cooperation mechanisms in the nuclear field and their permanence as a result of the existence of solid bases of friendship and of a firm commitment towards peace and development (1988 Joint Declaration on Nuclear Policy, Iperó).

Its set up was very similar to that of the JWG: under the direction of both foreign ministries, the PCNA included Argentine and Brazilian representatives from the foreign ministry (including the deputy ministers of foreign affairs) and from the two national nuclear energy commissions (including the presidents) and scientists. A former Brazilian member of the PCNA mentioned, "scientists – nuclear scientists – were in this committee" (Interview G). In addition, it was mandated to meet every 120 days, alternatively in Argentina and Brazil, in order to discuss topics of mutual interest in the nuclear field (Iperó Joint Declaration on Nuclear Policy, 8 April 1988). However, as an

Argentine representative from the PCNA remarked, between 1988 and 1991, the PCNA "worked very hectically: travelling every month to each country (staying for a week to ten days) sharing inventories" (Interview J). The main difference was that this was to be a *permanent* body to further the negotiations and propose directions.

Diplomats and technical experts were tasked to explore all avenues for nuclear cooperation, including collaboration, safety measures, a data bank for information exchange, and application of safeguards to their nuclear activities (Wrobel and Redick 1998: 169). The initial work of the PCNA was based on the presumption that full-scope IAEA safeguards should be avoided, given both countries' hostility to the international non-proliferation regime. The posture against "intrusive" full-scope IAEA safeguards had widespread support among both foreign ministries and nuclear experts (Wrobel and Redick 1998: 169). In their eyes, international inspectors were deeply suspected of being spies for the more developed countries (Albright 1997: 48). A former Brazilian representative from the PCNA remarked that Argentina and Brazil "did not want an international safeguards system" because "government officials were thinking of bilateral relations, and not international safeguards (i.e., not the NPT)" (Interview G).

President Sarney made the final of the Presidential visits to the Ezeiza nuclear facility near Buenos Aires in November 1988. Once again, another public declaration was released, repeating their commitment to pursue further dialogue and to increase cooperation on nuclear issues (1988 Ezeiza Joint Declaration on Nuclear Policy). In the case of the Iperó and Ezeiza declarations, the texts were widely circulated at meetings of the IAEA, OPANAL, and other international fora addressing nuclear issues, to demonstrate the deep level of nuclear cooperation reached (Fabbri 2005: 149).[123]

[123] OPANAL (Organismo para la Proscripción de las Armas Nucleares en la América Latina y el Caribe) is the Agency for the Prohibition of Nuclear Weapons in Latin America and the Caribbean, an international organisation which promotes nuclear disarmament.

It has been argued that these mutual visits to hitherto secret and unsafeguarded nuclear installations created an atmosphere of trust, "a necessary precondition to on-site inspections of the respective nuclear activities" (Wrobel and Redick 1998: 168). In addition, they propelled further declarations encouraging deeper bilateral nuclear cooperation. In the words of a Brazilian diplomat,

> Opening the facility to the scrutiny of a delegation headed by the Brazilian president allowed both leaders to end secrets and mistrust, and announce a new policy based on openness in nuclear matters" (Wrobel 1999: 143).

In addition, it is important to note that "while the presidents were publicly meeting and announcing fresh joint initiatives, the diplomats and scientific experts worked behind the scenes to transform trust and confidence into concrete measures" (Wrobel and Redick 1998: 168). The diplomats and scientific experts from the JWG/PCNA – i.e., the epistemic community – were arguably the leading force behind the process of bilateral nuclear cooperation. However, pressure for bilateral nuclear inspections was really the interest of a relatively small number of Argentine and Brazilian scientists and experts. According to Wrobel and Redick,

> Scientists played a valuable role in educating the public and influencing the leadership in both nations [...] to establish effective national, bilateral, regional, and international nuclear control mechanisms (1998: 166).

While the issue of bilateral nuclear inspections never became a factor for the mobilisation of a great number of physicists in either state, a few prominent scientists called for mutual inspections at international conferences and in international non-proliferation journals. For example, Luis Pingueli Rosa, a prominent Brazilian scientist presented a paper in 1988 at a seminar in Rio de Janeiro.[124]According to a participant present at the seminar,

> Pingeuli's presentation included the following time line: 1990 – new national control systems; 1992 – bilateral inspections, 1993 – Tlatelolco would be signed;

[124] This seminar was sponsored by the Brazilian Physics Society and the Washington D.C.-based Institute for Science and International Security (ISIS).

> and 1995 – Brazil would sign the NPT. We all said, "Luis, you're crazy" (Albright 1997: 48).

Even though Argentine and Brazilian scientists were calling for mutual inspections five years prior to Pingueli's 1988 presentation – the SBF and AFA's November 1983 joint declaration asking both governments to establish mutual inspections – the idea of Argentina and Brazil participating in bilateral inspections even in 1988 was still unfathomable, especially from an international perspective. However, a year after Pingeuli's presentation, four Brazilian scientists, including Pingueli, writing in *The Bulletin of Atomic Scientists* argued,

> To ensure peaceful coexistence in Latin America, we scientists stress the importance of a clear, public, official rejection of nuclear weapons in Brazil and elsewhere. Especially in Brazil and Argentina, where enrichment and reprocessing technologies could make nuclear weapons possible, enrichment should proceed *under conditions of full transparency and complete civilian control* (italics are added for emphasis, de Castro et al. 1989: 25).

In addition, in that same year, Argentine and Brazilian nuclear officials and scientists discussed "prospects for reciprocal inspections, international safeguard arrangements, a test ban, and other measures" at a conference in Montevideo, Uruguay.[125] At this conference, the idea of the bilateral control system was espoused by both Argentine and Brazilians as a way to assure the international community of their peaceful intentions (Levanthal and Tanzer 1992).

Based on the above, it can be argued that 1983–1989 agreements represented much progress towards the nuclear rapprochement. Advances were made towards full bilateral cooperation, including regular visits to each other's most sensitive and secretive nuclear facilities. In addition, some limited swaps of nuclear technology took place (Goldman 1991: 9). The next three years would be the most crucial in the nuclear rapprochement, since by 1991, ABACC had been established.

[125] This conference – "Latin American Nuclear Cooperation: Prospects and Challenges" – was organised by the Nuclear Control Institute, Washington D.C. It was held in Montevideo on 11–13 October 1989. The conference proceedings can be found in Levanthal and Tanzer 1992.

1990–1991

The 1990–1991 period marked the definitive end to the nuclear rivalry because by July 1991, the presidential decision to create a mutual safeguards inspection regime had been taken. During this period, both countries made efforts to begin to integrate with the nuclear non-proliferation regime by signing an agreement with the IAEA in the December 1991 Quadripartite Agreement, which established full-scope IAEA safeguards on all Argentine and Brazilian nuclear sites.[126] Both countries underwent a change in the presidential leadership with the elections of President Carlos Menem of Argentina (elected in 1989), and President Fernando Collor de Mello of Brazil (elected in 1990). Menem and Collor continued the nuclear legacy of their predecessors with the signing of four nuclear cooperation agreements, which included the decision to implement ABACC.

The first of the four cooperation agreements signed during this period was in July 1990. The Buenos Aires Joint Statement endorsed the previous nuclear cooperation accords and reiterated their countries' commitment to the peaceful uses of nuclear energy. Continuing the confidence-building measures, new Brazilian President Collor invited the media along with his personal associates to a military installation in the Cachimbo area, in the heart of the Amazon rainforest, in September 1990. There, he closed a huge shaft (320-metre hole), which was allegedly built by the armed forces as a nuclear test site (Goldman 1991: 9). Scientists claimed that the hole could have been used to carry out a test explosion (Homewood 1990: 14). In an interview with the *Washington Post* soon after, Collor would not confirm who built the shaft:

> It's very difficult to know when, how, who was responsible. It is a very sensitive issue. . . . Times have changed. The important thing is that the shaft is being

[126] The Quadripartite refers to Argentina, Brazil, ABACC, and the IAEA. Its complete title is "Agreement of 13 December 1991 between the Republic of Argentina, the Federative Republic of Brazil, the Brazilian-Argentine Agency for Accounting and Control of Nuclear Materials and the International Atomic Energy Agency for the Application of Safeguards".

> covered up with concrete and that we are not going to enter into any nuclear adventure in Brazil. We are embarked on a profound re-evaluation of the entire nuclear program (Podesta 1990: 27).

In that same month, President Collor gave a speech to the UN General Assembly in which he again stressed Brazil's peaceful intentions. In it, he announced that Brazil was radically changing its nuclear policy and had abandoned any attempt to build a nuclear weapons programme (Wrobel 1999: 144).

Although Collor's symbolic gesture was well-received, it raised the question of how effective the reciprocal visits were if Brazil's military had been able to build a secret site even without the President's knowledge. This lent urgency to further negotiations, and both countries' foreign ministries and nuclear commissions managed to reach an agreement within two months, culminating in the November 1990 Foz de Iguaçu Declaration on Common Nuclear Policy. In this declaration, the two presidents formally renounced nuclear weapons, accepted full-scope IAEA safeguards, abandoned the option to carry out peaceful nuclear explosions, and approved a common system of accounting and control of nuclear materials and installations – the last of which was to be administered through ABACC. President Collor remarked, "These initiatives will guarantee total mutual transparency of our nuclear programmes in the eyes of our peoples" (quoted in Homewood 1990: 14). For the first time, the two governments pledged to establish a mutual inspections regime, based on a common control system – known as the Common System for Accounting and Control of Nuclear Materials (SCCC).[127] Under this regime, the Brazilian nuclear energy commission would inspect facilities in Argentina, and the Argentine nuclear energy commission would inspect Brazilian nuclear energy facilities. It was described as "a system of neighbours watching

[127] The SCCC is a common system of accounting and control of nuclear materials and installations. In other words, both Argentina and Brazil have the same safeguards system (Marzo 1997: 60).The SCCC was formalised through INFCIRC/395, which was later signed in July 1991 and ratified in December 1991.

neighbours" (Marzo 1997: 36–37). On signing the declaration, President Menem remarked,

> Foz de Iguaçu [in 1985] was witness of the start of a process that has no antecedents: two countries, Brazil and Argentina, owners of relevant technologies in the nuclear field, decided to establish mechanisms for cooperation and for promoting confidence in such field, within the framework of a broader process of bilateral integration. Thus, our predecessors […] used the regional via in order to approach a problem recognised worldwide: the need to offer the region and the world control mechanisms that could be applied to the use of technologies that are highly important for development, although also susceptible to deviation to non-peaceful goals (Menem, quoted in Fabbri 2005: 163–164).

A Brazilian representative from the JWG/PCNA remarked that in 1990 alone, the Argentine and Brazilian nuclear delegation met 15 times in order to discuss the safeguards agreement. The representative explained that "they wanted to build the same common system of safeguards" and "that the objective was that Brazil should verify Argentina's facilities and vice-versa". In short, the representative remarked that the nuclear delegation noted in their meetings that there was a "need for a common system and a need to establish a verification system" (Interview G). These were established in December 1990 with the Foz de Iguaçu Declaration. After the declaration, Argentina and Brazil exchanged lists of their facilities ("with a description of one-to-two lines") and an inventory of nuclear materials. This, in the representative's words, was what made it "formal". In addition, *all* the top-secret facilities were included, "not just the ones under IAEA inspections". It can be argued that such frequent meetings and exchanges made a clear impact on subsequent Joint Declarations because after the 1990 Declaration, the July 1991 Guadalajara Accord (signed between Presidents Menem and Collor) called for initial inspections to be conducted and information exchanges in a 45-day period, continuing the frequent meetings. Such exchanges went "according to schedule" (Goldman 1991: 9). According to an Argentine official, "We have exchanged lists of installations and inventories of materials, and we are quite pleased at how smoothly this process has been effectuated" (quoted in Goldman 1991: 9).

In short, the July 1991 agreement formalised all the initiatives taken since the 1985 Foz de Iguaçu Declaration, stressing that both parties agreed to abstain from carrying out the testing, use, manufacture, production or acquisition by any means of any nuclear explosive device. In addition, it established guidelines for inspections and accounting procedures for the nuclear programmes in both countries. In other words, the Guadalajara Accord established ABACC to implement the bilateral inspection system SCCC.

The final agreement signed in this period was the December 1991 Quadripartite Agreement, signed between Argentina, Brazil, ABACC, and the IAEA. This agreement established full-scope IAEA safeguards on all Argentine and Brazilian nuclear sites. It marked the first steps of Argentina and Brazil's involvement with the international nuclear non-proliferation regime.

Argentina and Brazil's historic transition from nuclear rivalry to nuclear rapprochement is all the more remarkable because it took place against the backdrop of a volatile political climate. Both countries were led by military leaderships in 1980, and by 1985, democracy had been restored. Yet, during the 1980–1991 period, the leaderships of both countries changed (six times in the case of Argentina, and three times in the case of Brazil). In addition, the government type changed from military to democracy. In Argentina, during the military government, there were four different leaders (General Jorge Videla, 1976–1981; General Roberto Viola, 1981; General Leopoldo Galtiere, 1981–1982; General Reynaldo Bignone, 1982–1983). Then, with the return to democracy, Argentina saw two different presidents from 1983–1991 (President Raúl Alfonsín, 1983–1989 and President Carlos Menem, 1989–1995). Similarly, in Brazil, while there was only one military leader (General João Figueiredo, 1979–1985), with the transition to democracy, Brazil saw two different presidents (President José Sarney, 1985–1990 and

President Fernando Collor de Mello, 1990–1992).[128] The nuclear rapprochement began in 1980 with the first nuclear cooperation agreement and was furthered by Presidents Alfonsín and Sarney. By 1989, the Alfonsín and Sarney governments were on the verge of an economic disaster, with both countries experiencing hyper inflation rates and debt requirements (Goldman 1991: 9). The new administrations of Menem and Collor were also faced with severe economic difficulties, yet by continuing the nuclear legacy of 1980 and the mid 1980s, the nuclear cooperation managed to progress, culminating in the establishment of ABACC in 1991. In the words of José Goldemberg, a former Brazilian Secretary of State for Science and Technology, "the agreement ended a period in which Brazil conducted covert activities in military installations that *could have led to the production of nuclear weapons*. Argentina too had such aspirations" (italics are added for emphasis, 2006: 41). A Brazilian diplomat remarked that the agreement behind ABACC "was important politically for the two countries" because it "broke a lot of misunderstandings" (Interview C).

In a seminar held in Washington D.C. in 1998, Pedro Villagra-Delgado, an Argentine diplomat, explained that the road to ABACC started from establishing a common nuclear policy which evolved into a common system of nuclear safeguards and control (1998: 1). Upon close analysis of the nuclear agreements signed between Argentina and Brazil in the 1980–1991 period, it is clear that cooperation activities in the nuclear area gradually evolved to establish a mutual safeguards system. The common nuclear policy in the May 1980 agreement was defined as "cooperation in the use of nuclear energy" and the "development and application of the peaceful uses of nuclear energy" (May 1980 agreement). Seven years later, in the 1987 Joint Declaration, the common nuclear policy was defined as "ending any secrecy surrounding their nuclear programmes" (1987 Joint Declaration, Viedma). One mechanism to "end secrecy" would

[128] Appendix IV lists the governments of Argentina and Brazil from 1946–1995.

be through mutual inspections, the idea of which was heard from Argentine and Brazilian scientists throughout the 1983–1987 period, but was not included in the Joint Declarations until November 1990. Over the years, the Brazilian Physics Society (SBF) and the Argentine Physics Association (AFA) demanded the opening of nuclear facilities for mutual inspection, and called for bilateral nuclear cooperation on civilian oriented projects in the scientific, technological, and industrial fields, including medicine and engineering (Fabbri 2005: 175).

5.2 The Experts behind ABACC

Using Haas' definition of an epistemic community outlined in Chapter Two, it can be argued that the Argentine and Brazilian representatives from the JWF/PCNA comprised an epistemic community. Based on my understanding and research, these experts included both the scientific community (including representatives from CNEA and CNEN – the nuclear energy commissions in both states) *and* government/state officials (especially representatives from the foreign ministries).[129] In an interview, an Argentine diplomat explained that the representatives from CNEA and CNEN were professional technicians and "not political appointees" (Interview S). In addition, they had expertise in nuclear engineering and physics (Interviews I and J). The government officials – particularly from the Argentine side – were described as "a group of intellectuals [that] had academic rather than diplomatic training in foreign affairs" (Barletta 2000: 146). Both clusters of groupings were equally important in the thinking behind the creation of ABACC and its subsequent establishment.

As an Argentine diplomat explained,

> Crucial players leading up to the full opening of the nuclear programmes were the Argentinean and Brazilian (1) foreign ministers in the 1983–1991 period, (2)

[129] Describing the Argentinean foreign policy decision making team, Barletta explained that "a small and homogenous team comprised of President Raúl Alfonsín, Foreign Minister Dante Caputo, Vice Minister Jorge Sábato, and Vice Minister Raúl Alconada Sempé [were a] group of intellectuals [that] had academic rather than diplomatic training in foreign affairs" (Barletta 2000: 146).

> negotiating team with the IAEA in 1990–1991; (3) technical/safeguards scientists from CNEA and CNEN; and (4) representatives from the foreign ministries (Interview O).

Furthermore, the same diplomat surmised that "scientists, nuclear experts, diplomats, and other relevant officials according with the competence of nuclear matters in each country" comprised the Argentine-Brazilian epistemic community leading to ABACC.

A Brazilian diplomat made clear that a "combination of political leadership and physicists" was behind the thought process of ABACC (Interview D). As many interviewees explained, "the scientists offered the structure behind ABACC" (Interview A), "ABACC was the idea of scientists" and "the scientists played a very key role" in the establishment of ABACC (Interview D), yet the decision to create ABACC was, ultimately, "a political decision" (Interview L), "a government decision" (Interview J), and that the "main impulse for opening up [the nuclear programmes] came from the highest authorities in government" (Interview O). In addition, according to an Argentine diplomat, "there was an excellent communication between all sectors of both countries", "there were no closed segments just for scientists or diplomats", and that "communications among all those sectors were very fluid and interactive" (Interview O) Another Argentine diplomat remarked that "the communication between our delegations was both among diplomats, and mixed, with scientists from the two countries" (Interview P). A former Brazilian ABACC inspector explained that the epistemic community was "very influential and their role was fundamental" in the creation of ABACC (Interview G). Furthermore, he described two components behind the creation of ABACC:

> First, Brazilian and Argentine authorities were thinking of creating a mini EURATOM. The thinking was "let's negotiate *together*, not separately, with the IAEA. We'd be stronger". Second, Brazilian and Argentine authorities wanted to create an independent organisation as a kind of buffer just in case one country saw something in the other. In addition, this organisation should be independent from the two governments to avoid problems with the two countries.

Another Brazilian diplomat focused on the

> Important role of the political leadership [particularly] Alfonsín and Sarney. […] The advisors [to the Presidents] knew that cooperation in the nuclear area could have a great symbolic value to become part and parcel of bilateral cooperation (Interview D).

The scientific community in both states, particularly nuclear physicists and engineers, played an important role in actively promoting Argentine-Brazilian nuclear cooperation. In both states, scientists and their professional societies (e.g., the Brazilian Physics Society, SBF, the Brazilian Society for the Advancement of Science, SBPC, and the Argentine Physics Association, AFA) promoted public discussions on the need for regional nuclear arms control.[130] In 1987, Naren Bali, president of the AFA, urged nuclear commission officials to open up facilities that were still off-limits (Graham 1987: A18). These professional scientific societies were key lobbying elements before the Argentine and Brazilian congresses and presidents. It can be inferred that their impact was felt because, according to a former Brazilian ABACC inspector, from 1987, the "Argentinean and Brazilian nuclear delegations began to develop their joint inspection programme between country and country, and amongst scientists and scientists" (Interview G), paving the way for the creation of ABACC.

It is important to note, however, that the role of nuclear scientists and scientific organisations differed in both countries. In Argentina, a great number of nuclear physicists suffered political persecution during the most repressive years of military rule – in the mid-late 1960s and a decade later – and, as a result, many Argentine scientists did not openly question the established nuclear policies. On the other hand, in Brazil, political persecution was on a much smaller scale, and many nuclear scientists were strongly critical of the national nuclear programme, in particular the "parallel", military-

[130] The Brazilian Physics Society is a translation from the Portuguese Sociedade Brasileira de Física (SBF), the Brazilian Society for the Advancement of Science is a translation from the Portugues Sociedade Brasileira para o Progresso da Ciência (SBPC), and the Argentine Physics Association is a translation from the Spanish Asociación Física Argentina (AFA), taken from Wrobel and Redick 1998: 174; 176.

led nuclear programme (Wrobel and Redick 1998: 174). For example, a vocal group of Brazilian scientists was the leading force behind the critical appraisal of the 1975 nuclear agreement with West Germany. The SBPC and SBF pressed for congressional scrutiny of, and public debate over, the nuclear deal. In the process, they sharply criticised the nuclear agreement as unnecessary and unduly costly. In addition, during the 1980s, as reports of secret military nuclear activities began to surface, the SBF tried to persuade Congress of the need to implement institutional mechanisms to control nuclear decision-making and argued for specific constitutional guarantees against non-peaceful uses of nuclear energy. While the Brazilian Congress was unable to implement concrete measures of legislative control over the executive on nuclear matters, it did include in the new 1988 constitution a paragraph which requires that nuclear activities in Brazil be pursued only for peaceful purposes (Wrobel and Redick 1998: 174–175). In an interview, a former Brazilian ABACC inspector explained that the SBPC "formed the centre of the thinking in Brazil against the nuclear programme" (Interview G).

On an official level, scientific exchanges took place between CNEA and CNEN, which contributed to mutual understanding, collegial respect, and acquaintance with each other's nuclear programmes (Redick 1997: 18). This type of information exchange – exchanging views, ideas, and work on common research projects and safeguards technologies – fostered *shared understandings* amongst members of the epistemic community. These included: all nuclear activities in both countries should be under civilian control; nuclear technologies should be used for peaceful purposes only; a mutual system of safeguards and inspections should be established to guarantee the peaceful intentions of their nuclear programmes; and the two countries unite against a discriminatory international order and against U.S.-led efforts to pressure Argentina and Brazil into joining the non-proliferation regime (Fabbri 2005: 174–175).

It can be argued that the statements emanating from Argentine and Brazilian scientists in 1983, calling for a mutual safeguards regime, contributed to the thinking behind an inspections regime. Seven years after publically calling for mutual safeguards, the November 1990 Foz de Iguaçu Declaration stressed for the first time the approval of the Common System for Accounting and Control and the "first reciprocal inspections" (Declaration on Common Nuclear Policy, Foz de Iguaçu). The nuclear declarations seen throughout the 1980s therefore evolved from establishing a common nuclear policy to creating a common system of nuclear safeguards and control. Arguably, the later joint declarations institutionalised the idea of bilateral nuclear cooperation – the idea of which had originally come from Argentine and Brazilian scientific organisations.

Moreover, the foreign ministries of both states worked hard to further the rapprochement and to convince decision makers that nuclear cooperation was desirable. As a former Brazilian representative from the PCNA remarked, they were "the channels of communication" (Interview G). They were responsible for coordinating the JWG on nuclear issues and its successor the PCNA. In addition, negotiations for bilateral nuclear inspections were promoted at the Foreign Minister level (Wrobel and Redick 1998: 166). Furthermore, the foreign ministries invited all sectors from the nuclear field to engage in the process. For example, in Brazil, there were representatives from the Ministry of Science and Technology, from the private and public industrial sectors, from the nuclear energy commission, and from the different branches of the armed forces (Marzo 1997: 54). In addition, the foreign ministries argued for a change in nuclear policy. In Argentina, since the military had been discredited by the Malvinas/Falklands War, the Argentine Foreign Ministry argued for an end to Argentina's political isolation. In Brazil, the Foreign Ministry was motivated to change Brazil's nuclear policy as part of a larger

foreign policy objective – to achieve global stature and leadership for Brazil, including a permanent membership on the UN Security Council (Redick 1997: 17).[131]

Based on the above, it can be argued that the scientists had an equally important role as the government officials in that they were responsible for outlining the ways in which the mutual safeguards inspection regime could be created, from a scientific and technical perspective. Therefore, while government officials endorsed the idea behind ABACC and ultimately implemented it as policy, it was primarily the scientists who developed the entire concept and framework. The efforts by these individuals and organisations showed that "knowledgeable and dedicated people and groups opposed to nuclear weapons production can make a significant contribution to stopping their country from 'going nuclear'" (Albright 1990: 16).

5.3 How did an Argentine-Brazilian Epistemic Community Facilitate the Creation of ABACC and Influence its Implementation?

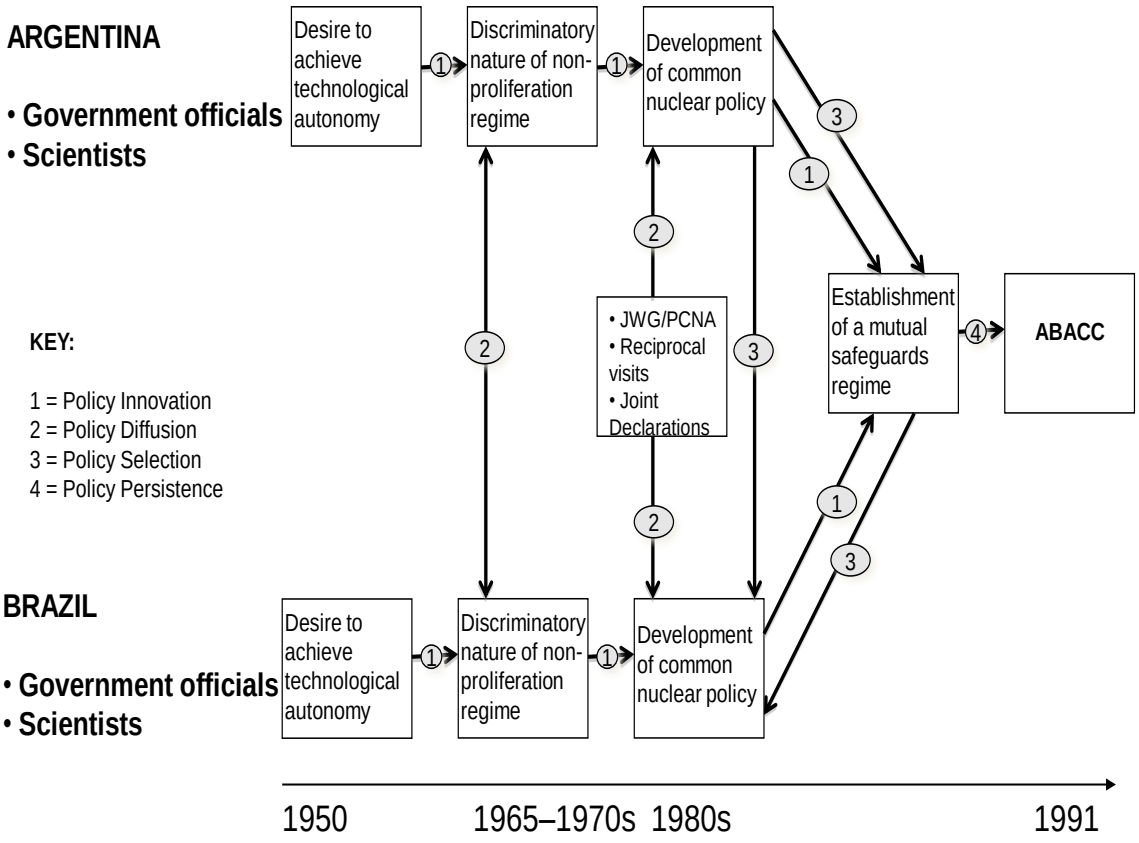
Having explained who was behind ABACC, it is important to analyse how the theoretical framework of the epistemic community approach sheds light on the origins of ABACC. In this section, I examine how – notably through the role of knowledge and expertise and having access to decision makers – the Argentine-Brazilian epistemic community outlined above facilitated the creation of the ABACC and its subsequent implementation as policy.

As discussed in Chapter Two, the epistemic community framework has been used to empirically study the role and impact of ideas in International Relations in relation to the creation of new international policies (Haas 1992a). Adler and Haas argue

[131] In addition to the foreign ministries, the finance ministries and the military of both nations also supported a change in nuclear policy: "As the two countries moved towards democratic governments, there was a commitment to open previously closed and inefficient markets to foreign investment. Access to advanced western technology was viewed as essential to the modernisation process, and change in the nuclear policy was essential to facilitate that objective for both nations" (Redick 1997: 17). Over the years, the Argentine and Brazilian military increasingly viewed the idea of nuclear competition as illogical: "The Falklands/Malvinas War encouraged [both] militaries to cooperate by demonstrating that both nations

that an epistemic community influences state decisions through the following four processes: policy innovation, policy diffusion, policy selection, and policy persistence (Adler and Haas: 375–387). Based on my understanding and research on the creation of ABACC Program and in using Adler and Haas' four influencing processes, Figure 5.1 puts forth one possible model illustrating the role of an epistemic community in influencing the creation of ABACC and its subsequent implementation as policy by Argentine and Brazilian state decision makers.

Figure 5.1:
The Path Towards the Creation of ABACC



were vulnerable to external powers in the South Atlantic, where both countries shared geopolitical interests" (Redick 1997: 17–18).

There were four phases involved in innovating the idea of a mutual safeguards inspection regime (marked by 1 in Figure 5.1), all of which included the involvement of Argentine and Brazilian scientists and government officials. The first phase took place throughout the 1950s–1970s, when both Argentina and Brazil shared a desire to acquire nuclear technological autonomy. This desire fostered an inherent and mutual shared disdain towards the international non-proliferation regime throughout the 1970s, which marked the second phase. As explained in the previous chapter, both states viewed the regime as discriminatory, designed to exploit developing countries. The criticisms against the nuclear non-proliferation regime espoused by both Argentine and Brazilian diplomats in international fora fostered a shared understanding on nuclear development, which, in part, led to the May 1980 agreement. Throughout the 1980s, a common nuclear policy was developed, marking the third phase. Having established a common nuclear policy, the final phase was marked by the shared desire to establish a mutual safeguards regime.

During the second stage, policy diffusion (marked by 2 in Figure 5.1), representatives from the JWG/PCNA participated in periodic meetings where they engaged in mutual exchanges of information, regular scientific and technical consultative exchanges, and participated in discussions surrounding the nature of the mutual safeguards inspection regime. During this stage, many joint nuclear declarations were released, and the reciprocal visits (both presidential and technical) to nuclear installations, including the secret enrichment facilities at Pilcaniyeu in Argentina and Iperó in Brazil, took place. These activities provided a structural space to encourage diffusion.

During the third stage, policy selection (marked by 3 in Figure 5.1), the role of Argentina was especially important since Argentine representatives took and led the initiative on a cooperative and collaborative joint nuclear partnership. After the two presidents signed the Guadalajara Agreement of July 1991, policy persistence, the final stage (marked by 4 in Figure 5.1), was marked by the subsequent implementation of the

policy behind ABACC. These influence mechanisms were facilitated by members of the epistemic community's knowledge and access to decision makers, which will be considered in turn below.

a) The Role of Knowledge and Expertise

An important stage of the epistemic community's influence in the creation of ABACC was the role of knowledge and expertise. According to an Argentine diplomat,

> On how to implement these new policies of openness [opening up nuclear facilities to the other for inspection], the "epistemic community" played a key role by analysing different alternatives and eventually designing ABACC and the Quadripartite Safeguards Agreement, as well as the ratification of both the Treaty of Tlatelolco and NPT (Interview O).

The experts behind ABACC – particularly the scientists – were crucial in designing the system of verification and mutual safeguards and inspections. As an Argentine diplomat remarked, "the scientists were abundant in the delegation leading towards ABACC" (Interview A). This was corroborated by a Brazilian diplomat who said that scientists dealt specifically "with the nuclear issue per se, i.e., the mutual inspections" (Interview D). Although they did not engage in scientific tests per se, the scientists involved in setting up the mutual inspections regime shared and disseminated collective knowledge through an intensive period of engagement and discussions through the JWG and PCNA. They used this knowledge in order to "internally define criteria for weighing and validating knowledge in the domain of their expertise" (Haas 1992b: 3).

In an interview, a former ABACC inspector (Interview G) explained that the "defined criteria" was the verification that both Argentine and Brazilian nuclear facilities were of a peaceful nature. This would be validated through the creation of a common system of safeguards and a verification system. These were both established in November 1990, under the Foz de Iguaçu Declaration, which created the common system for accounting and control of nuclear materials. After the Declaration, Argentina and Brazil exchanged their entire list of facilities (including descriptions of each facility)

and an inventory of nuclear materials, thereby validating that their nuclear programmes were of a peaceful nature (Interview G).

A Brazilian diplomat explained that the idea of the mutual inspections regime was due to the "crucial influence of the scientists". This was because through their knowledge and expertise, "they knew how to do it" and "they knew what to do" (Interview D). A former Brazilian representative of the PCNA explained that the scientists involved in the PCNA undertook a "regional safeguards training [programme] in Rio in 1988" in order to share collective knowledge and expertise (Interview G). The same representative remarked that the scientists were influential in the creation of the mutual safeguards inspection regime because of "their credibility" and their knowledge and expertise. An Argentine representative from the PCNA remarked that the expert technical groups within the PCNA "shared inventories, learnt lessons, to try to make their systems compatible" (Interview J). An Argentine diplomat remarked that the scientists "played a very important role from the technical point of view" in establishing ABACC (Interview L).

Moreover, it can be argued that the experts' knowledge was diffused, particularly through communication, within the JWG/PCNA setting, denoted by (2) in Figure 5.1. Meeting every 120 days, alternating between venues in Argentina and Brazil (as mandated in the nuclear agreements), the JWG/PCNA exchanged technical information and assured each other that their respective nuclear programmes were only for peaceful purposes. In particular, they developed specific measures on notification and assistance in all areas of nuclear safety, exchanged information on security of nuclear installations, and began joint research and information exchange relating to safeguards (Redick 1988: 5–9) – all of which required extensive knowledge and expertise. As a former Argentine Director of Nuclear Affairs explained,

> We had very frequent encounters with our Brazilian counterparts, and we even integrated a joint binational delegation to negotiate with the IAEA. Both national delegations were headed by diplomats with the technical support from the respective nuclear agencies (Interview P).

The reciprocal visits, public declarations, institutionalising nuclear dialogue and cooperation through the PCNA all provided a structural space to encourage diffusion. These activities served as reassurance to the international community (as well as to each other) that the Argentine and Brazilian nuclear programmes were of a peaceful nature. In addition, they also served as a precursor to establishing the mutual safeguards inspection regime. Even though Solingen remarks that institutions cannot be credited with initiating cooperation in the Southern Cone (1998: 276–277), once the process of nuclear cooperation had begun, an institutional setting such as the PCNA played a crucial role in expounding knowledge and exchanging and sharing ideas and information. Over time, the regular technical and political exchanges under the remit of the PCNA contributed to the transformation of Argentina and Brazil's nuclear policy from one of cooperation to one of verification. Marco Marzo, a former Brazilian senior planning and evaluation officer at ABACC, observed this when he said:

> The way in which Argentina and Brazil came together in the nuclear field is astounding. […] If you said to me at that time, in 1984 or 1985, that there would be a rapprochement between Argentina and Brazil, that the Bilateral Agreement would be signed in ten years, I would have said that you were crazy. […] The first steps were very small steps. The rapprochement did not start with visits to secret enrichment plants. We started with small working groups in various areas […] At the beginning, we never discussed secret facilities, enrichment, or reprocessing (1997: 33–34).

In other words, the PCNA was responsible for turning ideas into concrete measures. It was also responsible for reciprocal visits, maintaining steady contacts at the political and technical levels, and consultation to increase mutual knowledge of each other's respective nuclear programmes (Fabbri 2005: 173). This was corroborated by an Argentine scientist who remarked that the PCNA "helped facilitate the joint visits and increased transparency mechanisms" (Interview J). The constant attempts by diplomats, scientists,

and government officials to work on cooperative projects, and to maintain that commitment over a number of years was crucial in establishing the mutual safeguards inspection regime. As Wrobel and Redick conclude,

> An important factor in the establishment of ABACC was the great number of personal contacts made over many years between Argentine and Brazilian scientists, technicians, and other officials associated with the nuclear programmes. In particular, among the relatively small community of nuclear physicists, close personal relations evolved towards mutual trust and shared knowledge acquired from joint participation in bilateral or multilateral technical meetings. This helped end decades of long-held suspicions against foreign interference (1998: 177).

The work carried out by the PCNA facilitated political support in favour of progress towards mutual and international inspections. When the political decision to establish ABACC was taken (denoted by (4) in Figure 5.1), two respected and experienced nuclear physicists, Jorge Coll from the CNEA representing Argentina, and Carlos Feu Alvim, a professor of physics, representing Brazil, became the director and deputy director, respectively, of ABACC (Wrobel and Redick 1998: 177).

b) Access to Decision Makers

The extent to which the experts had access to decision makers was arguably another crucial factor in the creation of ABACC. Earlier, it was explained how the JWG/PCNA was created through the 1985 and 1988 nuclear agreements agreed between the two presidents. Representatives from the foreign ministries and the scientific community of both countries were tasked to explore all avenues for nuclear cooperation. One of their main roles was to further negotiations and propose directions for further nuclear collaborative projects (Wrobel and Redick 1998: 169). Given that the JWG/PCNA were set up by the presidents, it can be assumed that those within the JWG/PCNA had access to decision makers. In fact, the Collor administration hired one key member from the JWG/PCNA – a scientist – to implement the mutual inspections regime. From 1990–1992, Professor José Goldemberg was the Brazilian Minister of Science and Technology.

A nuclear physicist, Goldemberg was formerly the President of SBPC (1975–1979). He was a leading opponent of Brazil's parallel programme and sharply criticised the government's nuclear decisions throughout the 1970s (Wrobel and Redick 1998: 180, fn 15, Paul 2000: 108). In fact, as a Brazilian former representative from the PCNA remarked,

> The President at the time, Fernando Collor, was a rather inquisitive mind and developed a good relationship with me asking frequently questions about Science and Technology (S&T). (Interview E).

It can therefore be assumed that if one member from the JWG/PCNA had access to their country's president (in this case Brazil), other members of the JWG/PCNA could have also been granted access to the other country's president.

Based on the above, it can be argued that the role of Argentina (including that of President Sarney) was especially important in policy selection, denoted by (3) in Figure 5.1. As explained in Chapter Two, the extent of an epistemic community's role in policy selection involves two factors: decision makers' unfamiliarity with policy issues and the timing of policy choice (Adler and Haas 1992: 381–383). In the case of ABACC, while it is not clear to what extent Argentine and Brazilian decision makers were familiar with the issue of mutual safeguards (from a scientific and technical perspective, rather than from an interest perspective), it is quite clear that the two countries' presidents closely followed the issue, given the frequent release of joint declarations stressing their countries' common nuclear policies. In addition, as explained earlier, the JWG/PCNA was set up through a presidential initiative.

The second factor in assessing an epistemic community's role in policy selection involves *timing* (Adler and Haas 1992: 383). It may be easier for decision makers to accept ideas and advice from epistemic communities after political, military, or economic conditions have changed (Adler and Haas 1992: 383). In the case of ABACC, timing was important, especially the transition to democracy. From 1985 – once both states were

democracies – there was a greater exchange of information, leading to nine Joint Nuclear Declarations. However, in terms of selecting the policy of mutual safeguards, the role of Argentina was especially important. Argentine representatives took on the role of policy "broker" in taking and leading the initiative on a cooperative and collaborative joint nuclear partnership – steps that led to the establishment of ABACC – denoted by (3) in Figure 5.1. In fact, according to Resende-Santos, who conducted extensive archival research in Brazil on Argentina and Brazil's emerging security cooperation, the initiative for a nuclear accord – i.e., that of May 1980 – originated with Argentina (2002: 116). He argues that Argentina's earliest official statement on nuclear cooperation was prepared in 1978 by the Foreign Ministry's policy planning staff. The document urged

> Close monitoring of Brazil's nuclear programme for the purpose of adopting policies and measures necessary to neutralise or eliminate any real threat or potential threat to our country. At the same time, to study the possibilities of establishing cooperation rules or accords that could favour Argentina's nuclear programme (quoted in Resende-Santos 2002: 116–117).

In an interview, an Argentine diplomat explained that,

> The first move towards ABACC [was] started by us when President Alfonsín met President Sarney. We invited them to our enrichment plant in Pilcaniyeu. From there on, we started a process of conversation towards the acceptance of full-scope safeguards with the IAEA. We started to be satisfied with the bilateral reciprocal visits to each other sensitive facilities. The evolution was part of a natural process where we both discovered the advantages of a bilateral mechanism (Interview L).

This was corroborated by a former Head of International Affairs for CNEA, who explained,

> The idea to create ABACC was initially brought about from Argentinean technical nuclear authorities and was very well received by the Brazilians and by the respective diplomatic levels (Interview K).

Earlier, it was explained that official negotiations of a mutual safeguards inspection regime began in 1987. However, the idea of a bilateral/common system of nuclear inspections was first put forward in 1985. Argentine President Alfonsín proposed to Brazilian President Sarney that they should negotiate a bilateral system of control of

nuclear materials and installations and a bilateral verification system of nuclear facilities.[132] However, Brazil was not prepared to enter into negotiations at that time because the military was opposed to any form of control. In an interview, a Brazilian diplomat observed that Argentina was "much more open to progress" and that President Alfonsín was more open to improve bilateral relations than President Sarney, because of the terrible defeat of the Malvinas/Falklands War and the abrupt end to the Argentine dictatorship (Interview D). As Sarney was an appointed president, he lacked the legitimacy and even the will to exert presidential control over the Brazilian nuclear programme (Wrobel and Redick 1998: 169). As a Brazilian representative of the PCNA explained in an interview, "Brazil did not accept Argentina's proposal because Brazil wanted to cooperate and not be controlled" (Interview G). Nevertheless, soon after Alfonsín's proposal, the JWG was created in November 1985 to discuss nuclear issues. Three years later, its institutionalisation – as the PCNA – not only furthered nuclear negotiations but also facilitated the presidential and technical nuclear installation visits. The strength of the idea of bilateral inspections gradually emerged by these visits, by which time Brazil was more willing to participate in bilateral nuclear initiatives. It is important to note that the support for bilateral inspections grew in Brazil among the non-military sectors in part due to the Vargas Commission – an inter-ministerial committee composed of government officials set up by the Brazilian government in September 1985 (Fabbri 2005: 148). The Commission carried out an internal review of Brazil's nuclear policy and in April 1986 it endorsed and recommended the idea of the gradual establishment of a mutual inspections system with Argentina to be pursued for Brazil's nuclear policy (Spector and Smith 1990: 225; 398 fn 26).

[132] A *Washington Post* editorial remarks specifically that "the initiative has come from Argentina" (March 1985: A26).

5.4 Conclusion

From the uncertainty over Argentina and Brazil's nuclear programmes to the creation of a mutual inspection safeguards regime, it can be argued that the role of an epistemic community is an important factor to consider in examining the creation of ABACC – a bilateral policy coordination effort, which verified the non-nuclear weapon status of Argentina and Brazil. In the process of creating ABACC, Argentina and Brazil embarked on a number of confidence building measures which provided assurances to each other and to the international community that neither country were pursuing nuclear weapons. From nuclear rivalry to nuclear cooperation, an epistemic community emerged and engaged. This community comprised a network of professionals with recognised expertise in the area of mutual safeguards and inspections that had access to decision makers.

ABACC is the world's only bi-national safeguards agency responsible for verifying that the nuclear materials existing in both countries are being used exclusively for peaceful purposes. It is vested with the power to designate inspectors, carry out and evaluate inspections, and take legal action. It is made up of an equal number of Argentines and Brazilians. Dr. Marco Marzo, a former ABACC Senior Planning and Evaluation Officer described everything in ABACC as "symmetric, with a Brazilian and Argentine counterpart" (1997: 62).

Today, Argentine and Brazilian nuclear physicists continue to conduct mutual inspections at nuclear facilities on a cross-national basis through ABACC.[133] These inspections include verification of inventories of nuclear materials, unannounced and

[133] These inspectors render their services to ABACC only during the periods encompassed by the missions for which they are appointed. Brazilian inspectors verify the Argentine facilities, and Argentine inspectors verify the Brazilian facilities. According to ABACC's website, there are 86 Argentine and Brazilian inspectors, in exactly equal proportions.

short-notice inspections, and inspections carried out along with the IAEA (Paul 2000: 103). In addition, their work is undertaken with the full support of both governments.[134]

The international policy coordination outcome of the Argentine and Brazilian epistemic community's efforts in creating ABACC is six-fold. Since the establishment of ABACC in 1991, Argentina and Brazil have adhered to many international non-proliferation norms and commitments, shown below in Table 5.1.

Table 5.1:
Argentina and Brazil Nuclear Non-Proliferation Agreements

Agreement	Argentina	Brazil
Bilateral Agreements		
- SCCC	July 1991	July 1991
- ABACC	December 1991	December 1991
Quadripartite Agreement (full-scope IAEA safeguards)	December 1991	December 1991
Treaty of Tlatelolco	January 1994	May 1994
Nuclear Suppliers Group	1994	1996
NPT	February 1995	September 1998

While both nations were initially hostile to the non-proliferation regime, it is interesting to note that after their rapprochement, and *after the institutionalisation* of ABACC, Argentina and Brazil became fully integrated within the non-proliferation regime. First, they signed the Quadripartite Agreement between themselves, ABACC, and the IAEA; second, they signed Tlatelolco in 1994; third, they became signatories to

[134] The structure of ABACC involves a Secretariat, which includes six sectors (four technical, one administrative, and one devoted to institutional relations). The Secretariat carries out day-to-day activities, and consists of technical and administrative officers and support staff (designated by the Commission). Each nationality takes turns in acting as ABACC's Secretary (Marzo 1997: 62). A Commission (the highest organisational level in ABACC) – made up of two representatives from Argentina and Brazil – supervises the Secretariat's performance.

the Nuclear Suppliers Group; and, *lastly*, they acceded to the NPT. Therefore, it can be argued that the creation of ABACC is an important factor to consider in explaining the non-proliferation of Argentina and Brazil.

Case Study Two: From the Uncertainty of Command, Control, and Safety of Soviet Nuclear Weapons to the Denuclearisation of Belarus, Kazakhstan, and Ukraine: The Role of an American and Soviet/Russian Nuclear Non-Proliferation Epistemic Community in the Creation of the Nunn-Lugar Cooperative Threat Reduction (CTR) Program

Chapter Six

Belarus, Kazakhstan, and Ukraine's Nuclear Legacy: The Emergence of an Epistemic Community

> "As the Soviet Union began to break apart in 1991, mutual acquaintances on the Russian side, including some from the military, came to former Senator Sam Nunn of Georgia and me and pointed out the dangers of the dissolution of a nuclear superpower. The viability of their entire weapons custodial system was in doubt. Hundreds of tons of nuclear weapons material were spread across multiple sites in Russia and other former Soviet states."
>
> Senator Richard Lugar (1999: 52)

The following two chapters examine the role of an American-Soviet/Russian non-proliferation epistemic community in the creation of the Nunn-Lugar Cooperative Threat Reduction (CTR) Program.[135] The CTR Program was a very important factor in the denuclearisation of Belarus, Kazakhstan, and Ukraine because, *inter alia*, it provided financial and technical assistance to safely dismantle their inherited nuclear weapons. In the first chapter, the scope of Belarus, Kazakhstan, and Ukraine's inherited nuclear legacy is analysed, and the emergence of an American-Soviet/Russian nuclear non-proliferation epistemic community is discussed. In the second chapter (Chapter Seven), the process by which the epistemic community influenced the creation of the CTR Program is examined.

On 25 December, 1991, after close to seventy years, the Soviet Union ceased to exist as a state and subject of international law. In its place, 15 new successor states

[135] In these chapters, the focus is on the creation of the CTR Program, rather than on its implementation with Russia, Belarus, Kazakhstan, and Ukraine. Henceforth, the CTR Program refers to all the various programmes managed by the U.S. Departments of State, Energy, Defense, and Commerce, and their counterparts in the former Soviet Union.

emerged, 11 of which formed a Commonwealth of Independent States (CIS).[136] Tens of thousands of nuclear warheads, substantial quantities of nuclear material that could be made into weapons and an extensive chemical and biological weapons-capable stockpile were inherited by some of the new and struggling states including Russia, Belarus, Kazakhstan, and Ukraine.[137] Command and control of nuclear weapons under the former Soviet order had virtually disappeared overnight, leading new Ukrainian President Leonid Kravchuk to comment, "We don't know what we have" (quoted in Felton 2002: 4). The disintegration of the Soviet Union thus confronted the international community with an unprecedented security issue: the existence of four additional nuclear weapon states, three of which (the exception being Russia) had "never had their finger on the nuclear button" (Ustiugov 1993: 34).

During the Cold War, the number of the Soviet Union's nuclear weapon stockpile ranged between 33,000 to 45,000 (Norris and Kristensen 2006: 66).[138] When the Soviet Union collapsed, substantial numbers of these weapons were located in the newly independent states of Belarus, Kazakhstan, and Ukraine: 825, 1,400, and 4,025, respectively (Norris 1992: 25).[139] In addition, many of these were among the former

[136] On 8 December 1991, the presidents of Russia, Ukraine, and Belarus signed the Belavezha Accords, declaring the Soviet Union dissolved and subsequently establishing the Commonwealth of Independent States (CIS). The Russian parliament ratified the accords four days later, formally voiding the 1922 Treaty on the Creation of the Soviet Union. On 21 December, the leaders of the other Soviet republics (with the exception of Georgia) signed the Alma-Ata Declaration, affirming the dissolution and acceding to the CIS. The Declaration stated that the Union of Soviet Socialist Republics would cease to exist at midnight, January 1, 1992. On 25 December, Mikhail Gorbachev resigned as President and declared the office "extinct". On 26 December, the Council of Republics of the Supreme Soviet recognised the dissolution (Bernstein and Wood 2010: 14). The 15 successor states are: the Russian Federation, Belarus, Ukraine, Moldova, Georgia, Armenia, Azerbaijan, Kazakhstan, Uzbekistan, Turkmenistan, Kyrgyzstan, Tajikistan, Estonia, Latvia, and Lithuania. The latter three countries were not part of the CIS.

[137] These states also inherited a substantial amount of delivery vehicles, including advanced missiles, bombers, and submarines (Felton 2002: 4).

[138] Please note these figures include strategic and tactical nuclear weapons. Walker explains that "strategic weapons can be delivered over long ranges by missiles or heavy bombers; tactical weapons have shorter ranges, and are mainly intended for use in battle, whether on land, at sea or in the air" (1992: 257).

[139] Norris quotes from the Natural Resources Defense Council. The precise number of Soviet nuclear weapons deployed in the newly independent states were regarded as state secrets. The numbers provided are the estimates of subject matter experts, including Norris and Arkin 1991, Norris 1992: 25, Walker 1992: 260, de Andreis and Calogero 1995: 5.

Soviet Union's most advanced and powerful weapons. To put this into perspective, these countries became the third, fourth, and eighth largest nuclear powers in the world "overnight" (Lugar 2001: xiii). Furthermore, the total number of all nuclear weapons inherited was greater than those contained in China, France, and the UK combined (Nunn 2003: 16). However, by 1996, all nuclear warheads inherited from the Soviet Union were removed from the three states' territories, which resulted in their denuclearisation and in them becoming non-nuclear weapon states.[140] The question that subsequently arises is *why* did these countries choose to denuclearise and relinquish their nuclear weapons?

Scholars agree that the denuclearisation of Belarus, Kazakhstan, and Ukraine can be attributed to the high (economic and strategic) costs and low benefits attached to the maintenance of their inherited nuclear weapon arsenals, coupled with all three states wanting greater attention and financial assistance from the U.S. (Reiss 1995, Lepingwell 1993a; 1993b, Shields and Potter 1997, Bertsch and Potter 1999, Stevens 2008). However, what has been neglected in these scholars' analyses is the process by which the three former Soviet Union states relinquished their nuclear weapons which, I argue was through the CTR Program. The main focus in this case study is therefore to examine the role of an epistemic community behind the creation of the CTR Program, since many scholars and policy analysts agree that its most important achievement has been the denuclearisation of Belarus, Kazakhstan, and Ukraine (Woolf 1996, Combs 1997, Duffy 1997, Gottemoeller 1997, Orlov 1997, Potter & Shields 1997, Lugar 1999; 2001, Ellis 2001, Newman 2001, Daughtry 2004, National Academies 2004). Furthermore, as a former Director of the U.S. National Academy of Sciences Committee on International Security and Arms Control remarked, the CTR Program "provided incentives and

[140] Kazakhstan became nuclear weapons free on 24 April 1995, followed by Ukraine on 1 June 1996, and Belarus on 27 November 1996 (SIPRI Yearbooks 1996; 1997).

mechanisms to allow the denuclearisation to happen" (Interview IV). Consequently, this analysis focuses on the creation of the CTR Program and on how this legislation facilitated the denuclearisation of the three former Soviet states. In this case study, the analysis indicates that an American-Soviet/Russian epistemic community drove the thinking behind the concept of the CTR Program, which proved to be a very important factor in the denuclearisation of Belarus, Kazakhstan, and Ukraine.

The chapter is structured in two parts. The first section provides detailed information on Belarus, Kazakhstan, and Ukraine's inherited nuclear weapons stockpile in order to ascertain the extent of the unprecedented international security issue. In the second section, the chapter analyses both the composition and the emergence of the American-Soviet/Russian nuclear non-proliferation epistemic community. The influence mechanisms of the epistemic community, i.e., how it influenced the creation of the CTR Program and its subsequent implementation as policy, and the importance of the CTR Program in the denuclearisation of the three former Soviet states are analysed in the proceeding chapter.

6.1 Belarus, Kazakhstan, and Ukraine's Inherited Nuclear Weapons

As the Soviet Union was collapsing in December 1991, many uncertainties arose surrounding its future and that of the new independent republic states. The main uncertainty – from an international security perspective – centred on the 27,000 Soviet nuclear weapons (including Russia's share).[141] The future of the command and control of these weapons, the thousands of trained nuclear scientists, the secret nuclear cities and laboratories, the nuclear production facilities, and missile assembly facilities that would be inherited by the Soviet successor states was uncertain.

[141] In addition to the uncertainty relating to the fate of the 27,000 nuclear weapons, there were other concerns. These included food shortages, the lack of sufficient heating in the forthcoming cold winter months, intermittent electricity, an impending "brain drain" crisis, the prospect of high unemployment, hoarding of food, rampant inflation, and an absence of governmental authority (Nichol 1992: 16).

Such an unprecedented event confronted the international community with many immediate and unanswerable questions including, who would control the weapons? Would the new nuclear states retain their inherited nuclear weapons? How would the international community cope with four more nuclear weapon states? How would the dismantling of the new republics' nuclear arsenals be financed and managed? How could the international community prohibit the development of illicit trade in nuclear weapons or fissile material and other components from the weapons?[142] Considering the number of nuclear weapons at stake (illustrated in Table 6.1) and the overnight creation of three more nuclear weapon states, these questions required immediate attention.

In order to understand the context within which the epistemic community emerged in addressing these questions, it is important to provide detail on what exactly Belarus, Kazakhstan, and Ukraine inherited, which are considered in turn below.[143]

[142] Potter (1993: 3) argues that in light of the economic crisis in the former Soviet republics and the possible emergence of a global nuclear black-market, the fear of illicit trade seemed genuine.
[143] Please note, the figures provided do not include the number of biological and chemical weapons inherited. Instead, they focus specifically on the number of inherited nuclear weapons.

Table 6.1:
Former Soviet Union Strategic and Tactical Nuclear Forces, December 1991[144]

Republic	Weapons	Warheads
BELARUS		
• ICBM	• 81	• 81
• Tactical		• 1,120
KAZAKHSTAN		
• ICBM	• 104	• 1,040
• Bombers	• 40	• 320
• Tactical		• 650
RUSSIA		
• ICBM	• 1,064	• 4,278
• Bombers	• 101	• 367
• SLBM	• 940	• 2,804
• Tactical		• 8,525
UKRAINE		
• ICBM	• 176	• 1,240
• Bombers	• 21	• 168
• Tactical		• 2,605
Total ICBM	1,425	6,639
Total Bombers	162	855
Total SLBM	940	2,804
Total Strategic Warheads		10,298
Total Tactical Warheads		15,000[a]

[a] Please note, this figure includes tactical nuclear warheads based in the other Soviet republics (Belarus, Georgia, Azerbaijan, Armenia, Turkmenistan, Uzbekistan, Moldova, Kyrgyzstan, Tajikistan, Lithuania, Latvia, Estonia).

Key: ICBM: Intercontinental Ballistic Missiles; SLBM: Submarine Launched Ballistic Missiles; Tactical: warheads for ground forces, air defence forces, air forces, and navy.

Source: For all figures apart from the tactical nuclear warheads: International Institute for Strategic Studies, 1992: 30–46. For tactical nuclear warheads: Walker 1992: 260, Norris and Arkin 1991, de Andreis and Calogero 1995: 5. Please note these figures are estimates (please see footnote 133 for further elaboration).

[144] Strategic and tactical nuclear weapons are two types of nuclear weapons which describe the way the weapons are intended to be used (please see footnote 136 for further elaboration).

Belarus

As Table 6.1 indicates, of the three newly independent states, Belarus inherited the least amount of nuclear weapons. Its inheritance share amounted to 4.5% of the entire nuclear stockpile (de Andreis and Calogero 1995: 5). In addition to the 81 SS–25 intercontinental ballistic missiles (ICBMs) equipped with single nuclear warheads, Belarus inherited over 1,000 tactical (non-strategic) nuclear weapons (Cochran et al. 1989: 131–132, Walker 1992: 260, Reiss 1995: 131, U.S. Congress 1994: 36).

Kazakhstan

Kazakhstan's inheritance share amounted to 7.6% of the entire nuclear stockpile (de Andreis and Calogero 1995: 5). It inherited four missile bases, sites for in silo-launchers 104 SS-18 ICBMs, each capable of carrying ten high-yield nuclear warheads, 40 nuclear capable long-range missiles, strategic offensive forces equipped with over 1,400 nuclear warheads, 320 nuclear-armed, bomber-launched cruise missiles, and 650 tactical nuclear weapons (Cochran et al. 1989: 127, U.S. Congress 1994: 36, Walker 1992: 260, de Andreis and Calogero 1995: 5).

Ukraine

Second to Russia's 65.6% inheritance share, Ukraine's inherited nuclear weapons amounted to a 16.1% share (de Andreis and Calogero 1995: 5). Ukraine's nuclear inherited legacy included 130 SS-19 ICBMs (carrying 6 warheads per missile) and 46 SS-24 ICBMs (carrying 10 warheads per missile), 25 Bear H-16 long range strategic bombers (each equipped with 16 warheads mounted on air launched cruise missiles), 19 Blackjack bombers (each equipped with 12 nuclear tipped cruise missiles), 564 nuclear bombs and air-launched cruise missiles, and approximately 4,000 tactical nuclear weapons (Cochran

et al. 1989: 129–132, Norris and Arkin 1992: 48, Reiss 1995: 94, U.S. Congress 1994: 36, de Andreis and Calogero 1995: 5).

Considering the overwhelming number of nuclear weapons distributed across the three new independent republics and the overnight creation of three more nuclear weapon states (excluding Russia), it is clear that the international community was faced with an unprecedented international security issue. In total, Belarus, Kazakhstan, and Ukraine inherited approximately 7,655 (out of 27,000) strategic and tactical nuclear weapons with various delivery systems (e.g., ICBMs, bombers, etc.). Their combined totals represented a 28.2% share of the entire former Soviet nuclear weapons arsenal (de Andreis and Calogero 1995: 5). The existence of three new nuclear states presented a challenge to international security – particularly to nuclear non-proliferation – especially since none of the states were bound by pre-existing Soviet arms control agreements that committed the Soviet Union to unilaterally reduce its nuclear weapons arsenal. The impending dissolution of the Soviet Union and what this meant from a nuclear proliferation perspective provided the context in which the epistemic community emerged.

6.2 Denuclearising Belarus, Kazakhstan, and Ukraine: The Emergence of an American-Soviet/Russian Epistemic Community

As will be discussed in greater detail below, shortly after the failed 20/21 August 1991 coup d'état against Soviet President Mikhail Gorbachev – four months prior to the dissolution of the Soviet Union – American and Soviet non-proliferation experts (including academics, research analysts, and government officials) had anticipated the unprecedented international security threat of the possibility of the overnight creation of three more nuclear weapon states. Between August and December 1991 (when the U.S. Congress passed the Soviet Nuclear Threat Reduction Act of 1991 – the precursor to the

CTR Program), common anxieties regarding the control, command, and safety of 27,000 nuclear weapons were shared amongst like-minded American and Soviet/Russian experts. Within a five month period, these anxieties evolved into a technical and financial assistance package which would aid the denuclearisation of the three new nuclear weapon states. The assistance package culminated in the CTR Program, which paved the way for the denuclearisation of Belarus, Kazakhstan, and Ukraine.

The failed August 1991 coup provided the starting point for the emergence of the epistemic community that devised the CTR Program. A week after the attempted coup, the U.S. House Armed Services Committee heard a $1 billion humanitarian aid proposal for the Soviet Union by Les Aspin (D-WI). The proposed aid package would provide food and medicine for the Soviet people for the coming winter to prevent chaos. Senator Sam Nunn (D-GA) joined forces with Aspin and modified the proposals into one initiative: the ill-fated Aspin-Nunn initiative.[145] Without any active White House support and having been presented during an anti-foreign policy and anti-foreign aid mood, the initiative was sharply criticised for providing assistance to the "evil" empire of the Soviet Union. Consequently, Aspin and Nunn were forced to scrap their proposal.[146]

It should be noted, however, that while Aspin and Nunn were working on their initiative, two research teams at the universities of Harvard and Stanford were collectively studying the impending collapse of the Soviet Union and what this might mean for U.S.

[145] Nunn agreed with Aspin's proposal provided that the money be used at the president's discretion for continued Soviet control over its nuclear, biological, and chemical arsenals, as well as for technical assistance relating to defence conversion efforts (Ellis 2001: 26).

[146] The First Gulf War had finished in early 1991, and six months later, the political climate had changed. As Lugar explained, "The Bush administration was being criticised for being preoccupied with distant foreign policy matters at the expense of domestic well being. […] With the Gulf War won and the confrontational posture of the Cold War waning, the [U.S.] public was in a mood to deemphasise foreign assistance, military spending, and other costs of foreign policy in favour of domestic policy" (2005: 12). Tarnoff argued, "A declining U.S. economy coupled with White House resistance to extending unemployment benefits helped to create this temporary impasse by stimulating public opposition to foreign aid" (1993: 8).

national security. Their research was part of a broad "Cooperative Security" project, a collaborative effort between Harvard University, Stanford University, and the Brookings Institution funded by the Carnegie Corporation of New York (under Dr. David Hamburg's presidency). The research was being led by Dr. Ashton Carter (Harvard University), Dr. William Perry (Stanford University), and Dr. John Steinbruner (Brookings Institution). At the same time, four Soviet foreign policy experts (from both within and outside of government) went to Washington D.C. asking for U.S. assistance in storing and dismantling Soviet nuclear weapons, which prompted joint engagement on a cooperative research initiative. Consequently, these experts met with one another to discuss policies the U.S. could implement that would facilitate the control of the 27,000 nuclear weapons. They believed that uncertainty over Soviet nuclear command and control and the threat of further proliferation had to be controlled through American assistance. In addition, they agreed that command and control of the arsenal should be retained in Russia and that the other republics should not become nuclear weapon states. Furthermore, they agreed that curbing the spread of nuclear weapons was in the national security interest of the U.S. and indeed of the rest of the world (all to be discussed in greater detail below). By December 1991, U.S. policymakers presented the epistemic community's proposals to Congress, leading to the passage of the Soviet Nuclear Threat Reduction Act of 1991 – the initial CTR Program legislation.

Who were the Experts behind the CTR Program?

Using Haas' definition of an epistemic community outlined in Chapter Two, it can be argued that the non-proliferation experts behind the creation of the CTR Program comprised an epistemic community. These experts consisted of a network of 11 American and Soviet/Russian professionals with recognised expertise and competence in security and defence issues (including nuclear proliferation), illustrated in Table 6.2.

Table 6.2:
The Experts Involved in the Creation of the CTR Program[147]

Expert Cluster	U.S.	Soviet Union/Russia
Research Analyst/ Foreign Policy Specialist	Dr. John D. Steinbruner (Brookings Institution)	Dr. Andrey A. Kokoshin (ISKAN: The Institute for the U.S.A and Canadian Studies at the Russian Academy of Sciences) Dr. Sergey M. Rogov (ISKAN: The Institute for the U.S.A and Canadian Studies at the Russian Academy of Sciences)
Academics	Dr. Ashton B. Carter (Harvard University) Dr. William J. Perry (Stanford University)	N/A
Government/State Officials	Dr. Les Aspin (D-WI) Senator Richard G. Lugar (R-IN) Senator Sam Nunn (R-GA)	Dr. Viktor Mikhailov (Deputy Minister of Atomic Energy and Industry, later Minatom) Aleksandr N. Yakovlev (Gorbachev's closest advisor; former member of the Presidential Council and Politburo; former head of IMEMO: the Institute of World Economy and International Relations)
Funding Corporation	Dr. David A. Hamburg (Carnegie Corporation of New York)	N/A

[147] It should be noted that the people listed here were those who conceived the assistance package to Russia, Belarus, Kazakhstan, and Ukraine (i.e., the idea behind the CTR Program). They are not necessarily the people who implemented or worked on implementing the CTR Program with Russia, Belarus, Kazakhstan, and Ukraine.

Based on my research and understanding of the case, the American contingent included government officials Dr. Les Aspin, Richard G. Lugar, and Sam Nunn; academics Dr. Ashton B. Carter and Dr. William J. Perry; research analyst Dr. John D. Steinbruner, and President of the Carnegie Corporation of New York (a funding foundation), Dr. David A. Hamburg. The Soviet experts' contingent comprised government officials Dr. Viktor Mikhailov and Aleksandr N. Yakovlev; and civilian defence research analysts Dr. Andrey A. Kokoshin and Dr. Sergey M. Rogov. Although the scientific community is not represented per se, it should be noted that there were scientists involved in the thinking behind the CTR Program.[148] Furthermore, five of the experts came from a scientific background: Carter completed a Ph.D. in Theoretical Physics, Hamburg completed a M.D, Kokoshin completed a Masters degree in Engineering (in radioelectronics), Mikhailov completed a Ph.D. in Theoretical Physics, and Perry completed a Ph.D. in Mathematics. As Table 6.2 highlights, there were more Americans than Soviets/Russians (seven Americans; four Soviets/Russians). This was probably due to the fact that the Soviets themselves were more concerned and preoccupied with the dissolution of their Empire. Consequently, as will be discussed below, the American contingent worked tirelessly to provide U.S. government decision makers with policy recommendations in order to contain the nuclear proliferation threat and address the "specific concerns about stability and central control" (Interview III).

It can therefore be argued that, in line with the existing studies on epistemic communities, the experts involved in the creation of the CTR Program were comprised of both technical specialists (i.e., academics and foreign policy research analysts/

[148] According to Interview II (a former U.S. Assistant Secretary of Defense), the scientists that were involved included Donald Kerr (former Fellow at Harvard's Belfer Center) and Charles Zraket (former Director of Los Alamos National Laboratory and co-author of "Soviet Nuclear Fission", the seminal Harvard study which outlined policy proposals to safeguard the nuclear weapons arsenal of the disintegrating Soviet Union.) However, most interviewees explained that the scientists became more involved after the creation of the CTR Program in its implementation.

specialists) and government/state officials. As two interviewees argued, the "Nunn-Lugar idea came from academics" (Interview IX) and that "non-governmental thinking under girded the thought process of CTR" (Interview XXII). These experts provided the intellectual impetus behind the CTR Program.[149] According to Interview XXVI, all were involved and that "not one person can take full credit for the initiative. We all knew it had to be done." As will be discussed below, they believed that uncertainty over Soviet nuclear command and control and the threat of further proliferation had to be controlled through American assistance. (In the next chapter, their authoritative claim to policy-relevant knowledge is discussed in greater detail.)

It should be noted, however, that the experts behind the creation of the CTR Program were responsible for devising the assistance package to Russia and the nuclear-inheriting republics. They were not necessarily involved in implementing CTR with Russia and the other new republics. Since this thesis is interested in analysing the role of an epistemic community in the creation of nuclear non-proliferation agreements, the focus in this analysis is therefore specifically on the creation of the CTR Program, rather than on its implementation with Russia and the other nuclear-inherited states. However, several of those involved in the creation of the CTR Program later became officials in the first Clinton Administration, acquiring direct responsibility to implement the CTR Program as policy they had initially crafted. For example, Les Aspin would serve as Secretary of Defense (1993–1994); William Perry would become Deputy Secretary and later Secretary of Defense (1993–1994; 1994–1997, respectively); and Ashton Carter would serve as Assistant Secretary of Defense for International Security Policy (1993–1996). Carter established a new organisation within his nuclear security and counter-proliferation office dedicated to assisting the former Soviet Union and coordinating

[149] I am grateful to Interview XVIV who pointed out that members of an epistemic community should be considered an "intellectual" community rather than an "intelligence" community.

Nunn-Lugar CTR Program activities (Bernstein and Wood 2010: 11). Their appointments allowed the CTR Program to become institutionalised in the Department of Defense.

How did they Emerge?

> "In the fall of 1991, we [the U.S.] began to realise that there was a growing danger that the Soviet Union could neither fulfil its obligations under START I nor provide safety and security for its nuclear arsenal.[150] As events developed and the Soviet Union became first the CIS and then the Russian Federation, we in the U.S. had imperfect knowledge of what was going on, but realised that something must be done to insure that Soviet nuclear weapons were secure during a period of turmoil" (Interview I).

In Chapter Two, it was argued that an analysis from the existing epistemic community literature suggested that when decision makers are faced with uncertainty or complex policy issue areas and/or lack the expertise in a particularly complex issue area, an epistemic community is likely to emerge. As the quote above (from a U.S. negotiator of the Nunn-Lugar/CTR Program) suggests, decision makers in the U.S. were faced with uncertainty as they had "imperfect knowledge" vis-à-vis the disintegrating Soviet Union and realised that something had to be done in order to safeguard the loose Soviet nuclear weapons. U.S. decision makers' uncertainty, therefore, provided the context within which the epistemic community emerged. With the impending dissolution of the Soviet Union, there were many uncertainties surrounding the future of the Soviet Union and the new independent republic states, particularly in relation to the command and control of 27,000 Soviet nuclear weapons. Members of the epistemic community, using their expertise in nuclear (non) proliferation, sought to fill the "imperfect knowledge" gap

[150] The START Treaty (Strategic Arms Reduction Treaty) was a Treaty signed between the U.S. and the USSR on the Reduction and Limitation of Strategic Offensive Arms on July 31, 1991, five months before the collapse of the Soviet Union. Its entry into force was delayed due to the collapse of the USSR and awaiting an Annex that enforced the terms of the treaty upon Russia, Belarus, Kazakhstan, and Ukraine. START I entered into force on 5 December 1994, by which time all 5 START parties (U.S., Russia, Belarus, Kazakhstan, and Ukraine) had ratified it. Dates of START I ratification in chronological order: Kazakhstan: 2 July 1992; U.S.: 1 October 1992; Russia: 4 November 1992 (the Duma refused to exchange START instruments of ratification until Belarus, Kazakhstan, and Ukraine acceded to the NPT); Belarus: 4 February 1993; Ukraine: 5 December 1994.

facing the U.S. and offer policy suggestions in order to assist the newly independent states with the elimination of their inherited nuclear weapons.[151]

There were four stages to the emergence of the epistemic community, which took place over a five month period (outlined in Table 6.3). The first stage was marked by the imminent collapse of the Soviet Union and Aspin's immediate reaction to the failed August coup. The second stage was marked by the "Cooperative Security" initiative, an American-funded research project, which promoted an American-Soviet/Russian cooperative approach to arms control. The third stage was marked by the visit of four Soviet research analysts (from in and out of government) to Washington D.C. asking the U.S. for assistance in storing and dismantling Soviet nuclear weapons. In the final stage, members of the epistemic community were brought together culminating in the drafting of the Nunn-Lugar CTR Program. All four stages will be considered in further detail in turn below.

a) The Ill-Fated Aspin and Nunn Initiative (August–November 1991)

On 28 August, a week after the attempted coup, Les Aspin, chairman of the House Armed Services Committee (U.S. House of Representatives) proposed a $1 billion humanitarian aid proposal (to be taken from the FY92 Pentagon budget) for the Soviet Union to provide food and medicine for the Soviet people for the coming winter in order to prevent chaos (Aspin 1991a). In his proposal, Aspin (1991b: 4; 6) listed a number of uncertainties relating to the future of the Soviet Union, including economic, social, and nuclear control. Certain members of the U.S. Congress were worried that the disintegration of central authority in the Soviet Union could threaten the unified

[151] Please note that this refers to late 1991 at the time when Congress passed the Soviet Nuclear Threat Reduction Act. Later on, the Clinton Administration not only sought the epistemic community's advice in implementing the CTR Program, it also brought in three members of the epistemic community as senior officials (Aspin, Perry, and Carter).

command and control of the country's nuclear arsenal. For example Lee Hamilton (D-IN), a member of the House Foreign Affairs Committee said,

> We have to be alert to any possibility that the nuclear weapons might be dispersed. (...) The central authority in control of those weapons is critical from our standpoint (quoted in Graham 1991: 2).

Aspin called his proposal "defence by different means, but defence nevertheless" and argued that it was in the U.S. national security interest to promote democracy and reform by preventing chaos in the Soviet Union.[152] He tied this assistance programme directly to nuclear security when he remarked, "During the Cold War, the threat was deliberate Soviet attack. Now, the bigger threat seems to be chaos in a nation with 30,000 nuclear weapons" (quoted in Nunn and Lugar 1995: 140). To Aspin, investing what amounted to less than one-half of one percent of the defence budget to the cause of national (and international) security was one way in which to advance the U.S.' national security. He acknowledged, that given the uncertainties, it was,

> A whole different kind of threat […] a threat of the United States being obliterated by large numbers of Soviet weapons. What we're talking about now is Soviet weapons falling into hands of people who might use them as blackmail, who might use them as part of an attempt to establish independence for one republic or another (1991b: 10).

Since it was a "different" threat, a "whole brand new program of dealing with that threat" was necessary (Aspin 1991b: 10). Over the next week, the Committee on Armed Services held three hearings to explore how the U.S. military might administer aid and how great a need for help existed.[153] These hearings culminated in a White Paper by

[152] In his proposal, Aspin argued, "I would contend that it [his proposal] is essentially very much oriented towards national security. […] This money, spent in this way, is another way of spending defence. It's defence by another means, but it is defence nonetheless" (1991b: 9).

[153] The three hearings were: Hearing on Operation Project Comfort as a Possible Model for a Soviet Aid Effort (4 September 1991); Hearing on Assessing Needs in the Soviet Union (5 September 1991); Hearing on Distributing Humanitarian Aid (6 September 1991). All hearings are available in "Preventing Chaos in the Former Soviet Union: The Debate on Providing Aid", 17 January 1992).

Table 6.3:
The Origins of the CTR Program

1991:

STAGE ONE:		
-	**August**	20/21: Failed coup in Moscow
		28: Aspin presents his $1 billion humanitarian aid proposal
-	**September**	12: Aspin's White Paper
		15: Nunn's op-ed in *The Washington Post*[154]
		Nunn and Aspin revise the package: Aspin-Nunn initiative
STAGE TWO:		
-	**September–November**	"Cooperative Security" Project (collaborative project between Carter, Perry, and Steinbruner, funded by Hamburg)
STAGE THREE:		
-	**October**	24: Soviet visitors to Washington D.C., ask for U.S. assistance (Yakovlev, Rogov, Kokoshin, Mikhailov)
STAGE FOUR:		
-	**November**	13: Aspin and Nunn scrap their proposal 15: Meeting in Nunn's office with the Soviets (Yakovlev, Rogov, and Kokoshin) 19: Meeting in Nunn's office bringing together experts 21: Nunn and Lugar convene a bi-partisan meeting 22: Nunn and Lugar's op-ed in *The Washington Post*[155] 25: Senate votes 86–8 to provide $500 million to Soviet Union 26: Public Law 228 (The "Soviet Nuclear Threat Reduction Act of 1991", the original CTR Program legislation) passed by the House of Representatives
-	**December**	12: The Soviet Nuclear Threat Reduction Act of 1991 is signed into law by President George H. W. Bush

[154] "A Helping Hand, Not a Blank Check".
[155] "Dismantling the Soviet Arsenal: We've got to get involved".

Aspin in which he appealed for a "comprehensive approach" that would include a programme dealing with anti-chaos humanitarian aid, nuclear threat control, and defences against the new nuclear threat (Aspin 1991c: 6). In the White Paper, Aspin highlighted the new kind of nuclear threat facing the United States emanating from an "uncertain" Soviet Union; that of accidental or unauthorised nuclear use made possible through the threat of nuclear blackmail and nuclear smuggling (Aspin 1991c: 4).[156] However, not everyone agreed with his proposal. Secretary of Defense Richard B. Cheney referred to it as "foolish" and President Bush stated,

> I'm not going to cut into the muscle of defence of this country in a kind of an instant sense of budgetary gratification so that we can go over and help somebody when the needs aren't clear and when we have requirements that transcend historic concerns about the Soviet Union (quoted in Nunn and Lugar 1995: 142).

Senator Sam Nunn, chairman of the Senate Armed Services Committee, however shared Aspin's sense of urgency and wrote an op-ed in *The Washington Post* (1991a: C7), three days after Aspin's White Paper was published. In it, he encouraged the U.S. to help the Soviet Union and the republics dismantle their military-industrial complex through a variety of programmes as a way in which to enhance U.S. national security. Shortly after, Nunn and Aspin joined modified versions of their proposals into one initiative: the ill-fated Nunn-Aspin initiative. As Nunn explained,

> Les Aspin and I decided to do something very unusual. We decided to try to put this humanitarian aid package and my concerns about weapons of mass destruction together in a conference initiative, even though nothing of this nature appeared in either the House or the Senate bill (1997: xvi).

This bill proposed spending $1 billion (again to be taken from the Pentagon's budget) to provide emergency assistance to the Soviet Union, including food, medical aid,

[156] "Consider the possibility that a rebel group might gain control of a Soviet nuclear weapon, whether tactical or strategic. Might such a group either acquire an unsafeguarded weapon or gain access to the necessary codes through sympathetic contacts in the military? […] If civil war were to break out today, the security of the 12,000-plus tactical nuclear weapons in the Soviet Union – kept at hundreds of storage sites, many outside the Russian Republic – could be impossible to guarantee. In such a scenario, the possibility that the U.S. and other countries could be subject to nuclear blackmail by pariah leaders inside or outside the Soviet Union cannot be discounted" (Aspin 1991c: 6).

and technical assistance to safely transport, store, and dismantle its nuclear and chemical weapons. It also intended to provide assistance for conversion of Soviet military industries into civilian projects, environmental cleanup of sites contaminated by decades of Soviet weapons development, and occupational retraining and housing for decommissioned Soviet Strategic Rocket Forces officers (Schmitt 1991: 12, Hoagland 1991: A21, Lancaster 1991: A1, Combs 1997: 42, Lugar 2005: 13). Both Nunn and Aspin argued that the "investment would increase American security by helping prevent further instability in the Soviet Union" (quoted in Schmitt 1991: 12). Aspin argued,

> We're talking about the potential for chaos in a country with 30,000 nuclear weapons. It's clearly in our interest not to allow food and medicine shortages to trigger some kind of unrest (quoted in Schmitt 1991: 12).

Described as a "give away" and as "foreign aid" for Russia, House and Senate Republicans opposed the initiative. Senator Alfonse M. D'Amato (R-NY) complained that the U.S. "cannot afford to play Santa Claus to the Soviet Union when Americans are hungry and jobless" (quoted in Dewar 1991: 18, Nichol 1992: 17). Representative Robert Dornan (R-CA) asserted that "a billion dollars is a lot of money," especially for "the former 'evil empire' that caused 46 years of [high] U.S. defence spending" (quoted in Ellis 2001: 26). The absence of active White House support coupled with an overwhelming anti-foreign policy and anti-foreign aid mood forced Nunn and Aspin to scrap this idea, which they did on November 13.[157] While the Aspin-Nunn initiative ultimately failed, other non-proliferation experts (from the U.S. and the Soviet Union) were closely monitoring the disintegrating Soviet Union and exchanging ideas and information over the safety and security of the 27,000 nuclear weapons, discussed below.

[157] It should be noted that on November 5, Harrison Wofford, a Democrat, won a formerly Republican-held Senate seat in a special Pennsylvania Senate Race. Wofford won the election on the basis of an "America first" platform and in promising to "take care of our own" (Lugar 2005: 13, Combs 1997: 43). Aspin's floor statement to the House Committee on Armed Services November 13, 1991 can be found in the "Preventing Chaos in the Former Soviet Union" Report, January 17, 1992.

b) The "Cooperative Security" Research Initiative: "Soviet Nuclear Fission" (September–November 1991)

During the same time that Aspin and Nunn were working on their $1 billion aid assistance package, two research teams at the universities of Harvard and Stanford were studying international security issues and how they might impact U.S. national security. Dr. Ashton Carter, Director of the Center for Science and International Affairs at Harvard's Kennedy School of Government, was leading a research team that was analysing the control of the Soviet nuclear arsenal in a disintegrating Soviet Union. Dr. William Perry, co-Director of the "Preventive Defense Project" at Stanford's Center for International Security and Cooperation, was leading a research team that was analysing the giant military-industrial complex of the Soviet Union (Carter and Perry 1999: 71).[158] The Harvard and Stanford projects were parallel to another project being run at the Brookings Institution under the directorship of Dr. John D. Steinbruner. These projects were on a broader agenda they called "Cooperative Security" which were funded by Dr. David Hamburg, President of the Carnegie Corporation of New York.[159]

According to Carter, "By 1991, we were seeing something unaccustomed: the first-ever impending disintegration of a nuclear power" (2005: 1). Consequently, he and a team of Harvard researchers embarked upon a detailed study of such an unprecedented problem, which culminated in a study entitled "Soviet Nuclear Fission: Control of the Nuclear Arsenal in a Disintegrating Soviet Union", published in November 1991. The study argued that the "destiny of the 27,000 nuclear weapons on the territory of what is increasingly referred to as the "former" Soviet Union is a paramount concern of our times" (Campbell et al. 1991: i–ii). Since the study predicted that the break-up of the

[158] The "Preventive Defense Project" was a research collaboration between Harvard's Kennedy School of Government and Stanford's Center for International Security and Arms Control (which later became the Center for International Security and Cooperation) headed by Carter and Perry respectively.
[159] The Brookings Institution, Harvard, and Stanford all shared a grant from the Carnegie Corporation on the "Cooperative Security Project". The book that was written was entitled "A New Concept of Cooperative Security", published in 1992. I am grateful to Interview VII for these details.

Soviet Union posed the biggest proliferation threat of the Atomic Age, it outlined a new form of "arms control" that might prevent proliferation. The study suggested joint action by the two former Cold War enemies against the common danger of further proliferation (Campbell et al. 1991, Carter and Perry 1999: 71). In fact, as one interviewee remarked, "Rather than using confrontational methods that we [in the U.S.] had used in the past, we [realised that we] should use cooperative measures" (Interview XVI).

The study's main conclusion was that political and economic instability in the Soviet Union could have serious consequences for the safety and security of the Soviet Union's nuclear arsenal, particularly if the Soviet Union divided into independent republics (Campbell et al. 1991). Furthermore, the main recommendation they made was that the U.S. government should create assistance programmes to the new nuclear states to make sure that the vast Soviet nuclear legacy was not abused (Campbell et al. 1991: 117–129, Carter 2005: 1). Yet, by this point (November 1991), as Carter explained, "We had the study but not yet the audience of people in power who shared our concern" (2005: 1).

c) The Soviet Input Behind CTR (October–November 1991)

In addition to Carter's study and the collaborative Cooperative Security project taking place between Harvard, Stanford, and the Brookings Institution, the importance of the Soviet input behind the thought process leading to the creation of the CTR Program cannot be overlooked or underestimated. As one interviewee explained, "Russia was very involved. None of this would have happened without Russian involvement" (Interview XXII). [160] Furthermore, Interview XVI remarked, "There were some discussions with Russians from the Russian National Academy of Sciences about these ideas". As Senator Lugar (R-IN) was to conclude years later,

> Russian leaders requested our cooperation in securing and protecting Russia's nuclear arsenal and weapons-usable materials. This was the genesis of the Nunn-Lugar Cooperative Threat Reduction Program (1999: 52).

Between the end of October and 15 November 1991, four Soviet visitors went to Washington D.C. to ask for U.S. assistance in storing and dismantling Soviet nuclear weapons. These visitors included Gorbachev emissary and senior advisor Aleksandr Yakovlev,[161] civilian defence analysts Dr. Sergey Rogov and Dr. Andrey Kokoshin, and Deputy Minister of Atomic Energy and Industry Dr. Viktor Mikhailov (Oberdorfer 1991: C2, Nichol 1992: 1992). Rogov and Kokoshin both held senior positions in the Russian Academy of Sciences' Institute for the U.S.A. and Canadian Studies, a well-respected think tank/research institute in Moscow, and were well-known in Washington. Towards the end of October (circa 24 October), Mikhailov gave a presentation to the Senate Arms Control Observer Group detailing the "loose nukes" problem.[162] He warned of the inadequate facilities and funds to store and dismantle the nuclear weapons, and asked the members of the Senate Arms Control Observer Group, "Can you help? We [Soviet Union] need your help" (quoted in Oberdorfer 1991: 2, Nichol 1992: 18).

A week after Mikhailov's briefing, several U.S. key senators – including Nunn and Lugar – heard from Yakovlev, Rogov, and Kokoshin that the dangers to democracy

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[160] A number of interviewees remarked on the Soviet input dynamic, including Interview IX, Interview XII, Interview XV, Interview XVI, Interview XXIV, Interview XXVII.

[161] Mendelson explains that Yakovlev was Gorbachev's closest advisor and a former member of the Presidential Council and Politburo (1993: 340). In addition, he was a former head of IMEMO (Institute of World Economy and International Relations), another well-respected think tank/research institute in Moscow.

[162] Cambone explains that senators who participate in an observer group do not "surrender the constitutional obligation of the Senate to provide its advice and consent to ratification. But they do take on the obligation to avoid using privileged information for partisan purpose in the course of the ratification process" (2000: 216). The Senate Arms Control Observer Group – a bipartisan working group – was one example of a Senate Observer Group. It was established by Ronald Reagan in January 1987. While senators in the arms control observer group do not participate in the actual (arms control) negotiations, they do provide a continuing important link between the Senate and the U.S. President's administration's negotiators, keeping the Senate informed regarding developments and progress in the negotiations, and periodically advising and consulting with the U.S. negotiators. From April 1999, it became known as the Senate's National Security Working Group (NSWG) which established a bipartisan working group to address national security threats and responses.

and stability were growing more serious by the day in the Soviet Union.[163] Approximately two weeks later, on 15 November, Rogov and Kokoshin told a meeting in Nunn's office that power was slipping away from Gorbachev by the minute, and that in a "worst case scenario", which they said was not implausible, nuclear weapons could become the focus of struggles for power among the Soviet republics. The senators were told: "America has to wake up" (quoted in Oberdorfer 1991: 2). According to Oberdorfer,

> Despite the anti-foreign backlash in Congress, Lugar and Nunn agreed it was unthinkable to send no help and no signal of U.S. support at such a crucial moment in the Soviet Union. […] Lugar and Nunn agreed it was essential to pass at least a narrow, nuclear-related Soviet aid plan in the few days left before Congress recessed for the year (1991: 2).

It was at this point when members of the epistemic community converged to draft the CTR legislation.

d) Bringing the Experts Together (November–December 1991)

Six days after the failed Aspin-Nunn legislation was withdrawn, Hamburg (President of the Carnegie Corporation of New York) invited Carter, Perry, and Steinbruner to join Senator Lugar – a member on the Foreign Relations and Intelligence Committee – at a meeting in Nunn's office.[164] Lugar remarked,

> I had been following the progress of the Russian assistance issue [the failed Nunn-Aspin initiative], particularly as it related to the former Soviet Union's nuclear arsenal. I sought out Sam Nunn and indicated that I wanted to work with him in the Senate to produce a constructive result in the short time before Senate adjournment (2005: 14).

By this time, however, Nunn and Lugar had already been working together on a non-proliferation project for Hamburg (Nunn 1997: xvi). At this meeting, an informal exchange of ideas on the security of strategic weapons in the Soviet Union took place (Combs 1997: 43, Lugar 2005: 14, Carter and Perry 1999: 71).

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[163] These meetings were arranged by Tom Cochran and Christopher Paine at the (U.S.) Natural Resources Defense Council. I am grateful to Dr. Frank von Hippel for this information (email correspondence, 28 September 2009).

[164] As previously noted, Carter, Perry, and Steinbruner were collectively working on a Carnegie-funded project relating to the dissolution of the Soviet Union.

After this meeting, Nunn and Lugar organised a breakfast meeting with "15–20 key senators" featuring a briefing by Carter on the findings from the Harvard study, *Soviet Nuclear Fission* (Nunn 1997: xvi). In the meeting, it became clear that Senators Nunn and Lugar and their staff members, Robert Bell, Ken Myers, and Richard Combs, had also been working on a similar scheme for joint action. As Combs reminisced,

> The Harvard study reinforced Senator Nunn's conviction that it was in the national security interests of the United States to assist the Soviet Union, which appeared to be on the brink of total collapse, to secure and control its vast stocks of weapons of mass destruction. Senator Lugar […] was also impressed by Carter's briefing and agreed to join Senator Nunn in a concerted effort to revive the key parts of the abortive Nunn-Aspin legislation (1991: 44).

Further, according to Interview VII,

> Nunn was searching for policy tools to address the grave concerns he had about the WMD consequences of the Soviet dissolution, and found several appealing ideas in our Soviet Nuclear Fission project. I can say with confidence that Ash [Carter] did not attend that meeting with Nunn with the intent of pitching any particular program, and Nunn's interest certainly accelerated the pace of our effort and gave it sharper focus.

After the meeting concluded, Carter, Bell, Myers, and Combs stayed behind to draft the legislation for the "Soviet Nuclear Threat Reduction Act of 1991", the formal name of the Nunn-Lugar Amendment. In an interview, someone who was involved in drafting the CTR legislation said that the main goal was the "need to control the nuclear, biological, and chemical weapons" (Interview XI).

Two days after the meeting in Senator Nunn's office, Nunn and Lugar convened a bipartisan group of 16 senators at a working breakfast (Bernstein and Wood 2010: 7). Lugar recalls,

> Nine Democrats and seven Republicans met on November 21 for what became the first drafting session of the Nunn-Lugar Amendment. Sam and I sponsored subsequent meetings and made press appearances in support of an amendment that would provide up to $500 million in assistance to the states of the former Soviet Union for the safeguarding and dismantlement of their weapons of mass destruction stockpiles. As we pressed our colleagues, the long-term merits of our argument and the bipartisan atmosphere began to take hold. All this occurred with very little participation by the Bush Administration (2005: 14).

At this meeting, the topic was the Soviet Union and the safety of its nuclear weapons in which Carter repeated his briefing of the Harvard study from the previous two days and warned of the potential dangers of the Soviet nuclear arsenal as the state that had controlled it fell apart. Carter and his team suggested that the senators examine a set of policy recommendations outlined in the book; notably, that joint action by the two former Cold War enemies was needed against the common danger of further proliferation. Nunn and Lugar asked the senators to support legislation that would authorise the Pentagon to initiate U.S.-funded assistance to stem the "loose nukes" problem of the former Soviet arsenal (Carter and Perry 1999: 72).[165] It was reported that the aid plan was narrowed to helping the Soviet Union store and dismantle nuclear and chemical weapons, and that Nunn and others argued that it would be a bargain investment in stability to spend up to $500 million to eliminate thousands of them at the source (Oberdorfer 1991: C2). As Senator Lugar remarked,

> There was a remarkable consensus [among the senators] that we needed to […] work to initiate emergency legislation to deal with the nuclear dangers associated with the disintegration of the Soviet Union" (1991: 15).

Recalling the opposition that had plagued the doomed Aspin-Nunn initiative, the two senators later stated, "Once acquainted with Carter's analysis, these colleagues agreed that U.S. domestic political hostility to Soviet aid paled in comparison to the dangers in question" (Nunn and Lugar 1995: 144). At this meeting, Nunn and Lugar gathered support from the senators in attendance for a $500 million proposal to provide assistance for the safe transport, storage, destruction, and non-proliferation of Soviet weapons of mass destruction (Bernstein and Wood 2010: 7).

The very next day, Nunn and Lugar called for U.S. assistance in the dismantlement of the Soviet nuclear arsenal in their first joint op-ed piece in *The*

[165] Aspin defined loose nukes as "nuclear weapons that get loose in the Soviet Union either because they're taken and used as blackmail, they're stolen, they're sold on the black market, they get caught in the crossfire of ethnic unrest or civil war – whatever happens" (1991d: 141).

Washington Post.[166] In it, they highlighted both the opportunity "for the greatest reduction of weapons of mass destruction in history" and the danger of an "unprecedented proliferation of nuclear, chemical and biological weapons and weapons know-how" (Nunn and Lugar 1991: A25). U.S. assistance to the Soviet Union was crucial and imperative in their endeavour because the dismantlement of the Soviet nuclear arsenal would protect U.S. national security interests. They wrote,

> Cooperation with Soviet authorities on destroying nuclear and chemical weapons should not be postponed. The benefits of responding are too great, the dangers of inaction too severe. We believe Congress must act now to authorise a program of cooperation with the Soviet Union and its republics on the destruction of these weapons. [...] We do not know of any better way to help the people of America than reducing the potential military threat that faces our nation (1991: A25).

Finally, they stressed that this was not foreign aid, but rather a "prudent investment to reduce a grave threat" (Nunn and Lugar 1991: A25).

Three days later, the Senate held a debate on this issue with floor statements from Senators Nunn and Lugar, and Chairman Aspin.[167] When presenting the assistance package to the Senate, Nunn explained,

> This is major legislation. I consider this amendment that we have just sent to the desk a very important amendment, perhaps as […] one of the most important amendments in terms of our national security, indeed the security of the world, that has been before this body in many years. […]We are on the verge of either having the greatest destruction of nuclear weapons in the history of the world or the greatest proliferation of nuclear weapons, nuclear materials, and scientific know-how on how to make these weapons, as well as chemical weapons, ballistic missiles, even biological weapons the world has ever seen (1991b: 10–11).[168]

The Senate voted 86–8 to provide $500 million from Pentagon funds to assist control and destruction of Soviet nuclear weapons (Oberdorfer 1991: C2). $400 million

[166] Their joint *Washington Post* article was called "Dismantling the Soviet Arsenal: We've got to get involved," which appeared in the 21 November 1991 edition.
[167] Senator Carl Levin (Democrat from Michigan) and Senator David Boren (Democrat from Oklahoma) also gave statements.
[168] Lugar's address further enhanced the national security message conveyed by Nunn, as he said, "This is not foreign aid; our amendment is part of a national security package.[…] The obvious advantage of substantial Soviet denuclearisation is that it would eliminate a major portion of the nuclear threat to United States security and survival, as well as that of its allies" (1991: 15).

was authorised for the dismantling of nuclear, chemical, and biological weapons, and $100 million was authorised for transporting emergency food and medical aid (Kim 1992: 12, Tarnoff 1993: 2). As Lugar noted, "the wide margin of the vote itself was indispensable to the early acceptance of the program" (2005: 15). The House followed suit the next day, and on November 26, Public Law 228, the Conventional Forces in Europe Treaty Implement Act amendment entitled the "Soviet Nuclear Threat Reduction Act" of 1991 authorising $500 million in aid to the Soviet Union was passed.[169] Two weeks later, on December 12, Nunn-Lugar was signed into law.[170] According to the Soviet Nuclear Threat Reduction Act of 1991, the CTR Program would be

> Limited to cooperation among the United States, the Soviet Union, its republics, and any successor entities to (1) destroy nuclear weapons, chemical weapons, and other weapons, (2) transport, store, disable, and safeguard weapons in connection with their destruction, and (3) establish verifiable safeguards against the proliferation of such weapons (P.L. 102–228, Section 212, 1991).

The Experts' Key Features

Having explained who devised the CTR Program and how the experts came together, it is important to reflect on their characteristics in order to ascertain to what extent the experts can be considered an epistemic community. It can be argued that the non-proliferation experts behind the creation of the CTR Program comprised an epistemic community not only because of their authoritative claim to policy-relevant knowledge in a particular domain (nuclear weapons proliferation), but also because they shared the

[169] The act began by stating, "The Congress finds that Soviet President Gorbachev has requested Western help in dismantling nuclear weapons, and (that) President Bush has proposed U.S. cooperation on the storage, transportation, dismantling and destruction of Soviet nuclear weapons" (P.L.102–228, Section 212, 1991).

[170] President Bush signed Public Law 102–229, the Dire Emergency Supplemental Appropriation Act. Title III incorporated the Soviet Nuclear Threat Reduction Act (Nunn Lugar legislation). Section 108 authorised the President to establish a programme to assist Soviet weapons destruction. It provided for the transfer of up to $400 million from FY1992 Department of Defense operation and maintenance funds to assist the transportation, storage, safeguarding, and destruction of nuclear, chemical, and biological weapons capabilities in the former Soviet Union (Shuey and Davis 1993: 10).

same set of normative, principled, and causal beliefs, notions of validity, and a common policy enterprise. It was explained in Chapter Two that these two distinguishing features differentiate members of an epistemic community from members of other groups often involved in policy coordination (Haas 1992b: 19). Members of the non-proliferation epistemic community's authoritative claim to policy-relevant knowledge can be seen through their institutional affiliations, outlined in Table 6.2 above. How they used their knowledge and what the exact role of knowledge and expertise in the creation of the CTR Program will be discussed in further detail in the next chapter.

The shared *normative and principled beliefs* held by members of the epistemic community were that the disintegrating Soviet Union and its subsequent new nuclear-inherited republics would need U.S. technical and financial assistance in dismantling its nuclear arsenal. The non-proliferation experts believed that the provision of such assistance far outweighed the consequences of the Soviet Union and its republics being left on their own. For example, as mentioned above, Aspin and Nunn's $1billion humanitarian aid bid proposed to provide technical assistance to safely transport, store, and dismantle Soviet nuclear (and chemical) weapons; an investment that would "increase American security by helping prevent further instability in the Soviet Union" (quoted in Schmitt 1991: 12). From the Soviet perspective, Mikhailov's presentation to the Senate Arms Control Observer Group, alluded to above, warned of the inadequate facilities and funds to store and dismantle the prospective "loose nukes", stating that the Soviet Union needed U.S. assistance. In addition, the authors of the Harvard study argued that U.S. assistance could be instrumental in ensuring that the dissolution of the Soviet Union would not result in several new nuclear weapons states in the region (Campbell et al. 1991: 119–126). In their 22 November 1991 *Washington Post* op-ed, Nunn and Lugar outlined that a U.S. assistance programme towards the newly independent states would be a "prudent investment [as] we face the danger of an unprecedented

proliferation of nuclear, chemical and biological weapons and weapons know-how" (1991: A25).

The *shared causal beliefs* held by the epistemic community was the idea that if the Soviet nuclear arsenal residing outside of Russia was not dismantled, there might be further nuclear proliferation, resulting in an increasingly less-secure world. The attempted August coup and the subsequent dissolution of the Soviet Union raised concerns amongst members of the epistemic community – particularly those working on the Cooperative Security project (e.g., Carter, Perry, and Steinbruner) – over the command, control, and safety of Soviet nuclear weapons. According to Nunn, the Harvard study "was a timely study [...] that outlined in an analytical, scholarly format the dangers of nuclear command, control, and safety in an unstable Soviet Union" (1997: xvi–xvii). Furthermore, shortly after Nunn and Lugar had been briefed on the Harvard study by Carter in mid November 1991, in an address to the U.S. Senate, Nunn explained

> Senator Lugar and I believe that the basic premise of the amendment [the Soviet Nuclear Threat Reduction Act of 1991] is that the former Soviet Union, still a nuclear superpower, is coming apart at the seams. The danger of proliferation of existing weapons, weapons materials and weapons know-how is growing as both the Soviet economy and traditional Soviet control mechanisms lose effectiveness. Soviet leaders are anxious to destroy nuclear and chemical weapons and have asked our help. We should act now, and this amendment will allow us to do so (1991b: 11).

The main concern was not that these nuclear weapons might be launched (either against the U.S. or in a civil war), but that political fragmentation could potentially increase the danger of proliferation in three ways. First, the successor states might keep the nuclear weapons located on their territory; second, in an unstable and poor post-Soviet commonwealth of independent states, nuclear weapons might be sold for currency or provided by forces to ethnic or religious compatriots abroad; and third, the Soviet nuclear fuel infrastructure was highly dispersed. As central authority erodes, "control of nuclear material, technology, and expertise becomes challenging" (Goldman 1992: 9). These dangers were clearly articulated in the Harvard study and in Lugar's 25

November 1991 address to the Senate in which he stated

> All three of these dangers warrant immediate consideration of the sources of United States influence to achieve preferred outcomes as the Soviet Empire dissolves and its nuclear weapons complex devolves to the successor states. Nonstrategic nuclear weapons within the former Soviet Union are a source of major concern because of their great number and variety and because they are more widely dispersed among the republics than strategic weapons. Moreover, the system of procedural and technical safeguards that has prevented unauthorized seizure or use of these weapons for over 40 years offers no guarantees in the face of widespread social disorder of the kind on the horizon in the Soviet Union. Thus, removal of these weapons to central storage and ultimately destroying them is of critical importance (1991: 14).[171]

Months after the Harvard study was published, Hamburg outlined the nuclear danger of a disintegrating Soviet Union in his testimony before the U.S. Senate Committee on Foreign Relations, in which he stated,

> With the end of the Cold War and the dissolution of the unified Soviet state, the nuclear danger has in some ways risen and we face challenges of a largely unprecedented nature. [...] As republics establish their independence and their separate armies, they could choose to keep portions of the arsenal including nuclear, chemical, and biological weapons (1992: 415).

Based on the Harvard study and on the testimonies of Nunn, Lugar, and Hamburg, it can be argued that their causal beliefs of not dismantling the Soviet nuclear arsenal would lead to further proliferation and other dangers increased the U.S. interest in prompt cooperation with Soviet authorities on all these issues.[172]

Although members of the epistemic community did not engage in scientific tests per se, they shared and disseminated collective knowledge through an intensive period of engagement and discussions (particularly throughout November 1991, illustrated in Table 6.3). They used this knowledge in order to "internally define criteria for weighing and validating knowledge in the domain of their expertise" (Haas 1992b: 3). The defined

[171] It should be noted that these dangers were also articulated by Carter's 13 December 1991 statement before the Defense Policy Panel, House Armed Services Committee in which he outlined the main findings from the Harvard study (Carter 1991: 243).
[172] Other dangers included the dangers of a "brain drain" of nuclear scientists to radical Third World regimes and the threat of food shortages during the winter (Nichol 1992: 16).

criteria were the denuclearisation of Belarus, Kazakhstan, and Ukraine, and the prevention of further nuclear proliferation. As a former U.S. Assistant Secretary of Defense explained,

> We took a broad approach to denuclearising Ukraine, Belarus, and Kazakhstan. We understood it wasn't only a technical thing. There was a cultural understanding. We [the U.S.] gave the countries an alternative to nuclear weapons for security.

In a testimony before the U.S. Senate Foreign Relations Committee, Carter outlined the "broad approach" when he said,

> The CTR Program advances U.S. security interests. First, it speeds the dismantling of nuclear weapons in the four NIS [Newly Independent States] where they remain. It provides leverage to encourage these countries' decisions to dismantle and also speeds the actual process by providing assistance necessary to implement those decisions. […] Second, the CTR Program decreases the danger of the nuclear warheads and fissile material that remain in the NIS and represent a potential threat to the U.S. Third, […] the CTR Program decreased the long-term nuclear threat by reducing the capacity and economic pressures in the NIS to continue to produce weapons of mass destruction (1994: 2–3)

Finally, the *common policy enterprise* was two-fold. First, it entailed the denuclearisation of Belarus, Kazakhstan, and Ukraine, and, second, it envisioned the prevention of further nuclear weapons proliferation. According to Interview XVI,

> Russia [and the U.S.] would not tolerate the three nuclear republics having control of the nuclear weapons. Getting the three to realise this was crucial and a key component to success. It was done through visiting, official diplomacy, declarations, and discussions between [the U.S.] and Ukraine, Belarus, and Kazakhstan. These countries came to accept that they would be relocating the nuclear weapons back to Russia, and came to accept their NPT status [as non-nuclear weapons states].

In addition, Interview XII remarked,

> Both Russia and the U.S. were concerned about the three new nuclear weapon states for non-proliferation reasons. Both wanted to implement the START Treaty. Russia wanted to consolidate these weapons. They did not want Belarus, Ukraine, and Kazakhstan to have the nuclear weapon status.

As Interview XVII concluded, "CTR created a situation where the countries could agree to the denuclearising".

6.3 Conclusion

Based on the above, it can be argued that the uncertainty surrounding both the dissolution of the Soviet Union and the unknown fate of the command and control of the 27,000 Soviet nuclear weapons encouraged the emergence of an epistemic community. After the failed August 1991 coup, the likelihood of the dissolution of the Soviet Union became more prominent and the threat of more nuclear weapon states became more real. Consequently, American and Soviet/Russian experts from both within and outside of government began to worry about the prospect of the "loose nukes" scattered around the former Soviet Union. Collectively, they agreed that providing U.S. technical and financial assistance to the former Soviet Union and its successor states in dismantling its nuclear arsenal was tantamount in curtailing nuclear proliferation. As will be discussed in the next chapter, these experts used their knowledge and expertise in the issue of nuclear non-proliferation and their ties to decision makers to influence Congress to pass an assistance programme to Russia and the new independent nuclear states of Belarus, Kazakhstan, and Ukraine. Once Congress passed this legislation – the Soviet Nuclear Threat Reduction Act of 1991 (the original CTR Program legislation) – in December 1991, $400 million was allocated from the Department of Defense's budget to execute the safe and secure dismantling of the Soviet nuclear infrastructure. Over the next five years, the CTR Program legislation facilitated the denuclearisation of Belarus, Kazakhstan, and Ukraine, which is discussed in the next chapter.

Chapter Seven

Examining the Influence of the American and Soviet/Russian Epistemic Community in the Creation of the CTR Program: The Importance of the CTR Program in the Denuclearisation of Belarus, Kazakhstan, and Ukraine

> "We [the U.S.] face a period of uncertainty as Russia and other republics sort out possession of the weapons, and establish new structures and procedures for controlling and operating them. Another sobering thought: none of the governments of these new nuclear powers is yet bound by commitments made by the old Soviet Union."
>
> Robert M. Gates, former C.I.A. Director (1991: 180)[173]

In this chapter, the process of how American and Soviet/Russian non-proliferation experts created the CTR Program and were able to influence its subsequent implementation as policy is analysed. In addition, the importance of the CTR Program in relation to the denuclearisation of Belarus, Kazakhstan, and Ukraine is discussed. As explained in the previous chapter, members of the epistemic community comprised a network of American and Soviet/Russian representatives from government bodies, academia, a funding corporation, and research institutes/think tanks. During a five month period (August–December 1991), these experts, aware that the dissolution of the Soviet Union would create an unprecedented international security threat, worked tirelessly to gain the attention of U.S. decision makers. Their efforts culminated in the passage of legislation that would enable the U.S. to provide financial and technical assistance to the new independent states of Belarus, Kazakhstan, and Ukraine. Over the months, the epistemic community stressed the importance of offering an assistance programme, which would facilitate the denuclearisation of the three states. The epistemic community's proposals were adopted and implemented by the U.S., culminating in the establishment of the Soviet Nuclear Threat Reduction Act of 1991 – the original legislation behind the CTR Program – in December 1991. Once Congress passed the

[173] Statement before the House Armed Services Committee, Defense Policy Panel, "Hearing on the Situation in the Soviet Union", December 10, 1991.

CTR bill, $400 million was allocated from the Department of Defense's FY 1992 budget to begin the safe and secure dismantling of the Soviet nuclear infrastructure. Every year since then, new funds for each fiscal year were authorised for the continuation of the CTR Program. Between FY 1992 and FY 1996, Congress authorised almost $2.1 billion for the CTR Program (Ellis 2001: 29).[174]

It is important to note that three months before the CTR Program was signed into law, the U.S. Congress refused to pass a $1billion humanitarian aid to the Soviet Union, proposed by Representative Les Aspin (D-WI) and Senator Sam Nunn (D-GA).[175] Described as a "give away" and as "foreign aid" for Russia, House and Senate Republicans opposed the initiative, forcing Nunn and Aspin to scrap their proposal. This begs the following question: how was Congress influenced to pass the Nunn-Lugar legislation in December 1991 three months after it strongly criticised Aspin's initial humanitarian aid package? I argue that an epistemic community, which emerged during the uncertainty surrounding the break-up of the Soviet Union, was able to persuade Congress that securing former Soviet nuclear weapons was in the U.S. national security interest, and indeed in the interest of international security and, as such, an assistance programme was necessary. Members of the epistemic community believed that the uncertainty over Soviet nuclear command and control and the threat of further proliferation had to be controlled through U.S. assistance.

As newly nuclear-inherited states, it was not entirely clear what Belarus, Kazakhstan, and Ukraine planned to do with their inherited nuclear weapons, adding to

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[174] Ellis notes that of this $2.1 billion figure, Congress chose not to renew almost $330 million in transfer authority that expired at the end of FY 1994, and rescinded $20 million in FY 1995 funds (2001: 42, footnote 10).

[175] As explained in the previous chapter, the $1 billion proposed bill would provide emergency assistance to the Soviet Union, including food, medical aid, and technical assistance to safely transport, store, and dismantle its nuclear and chemical weapons. It also intended to provide assistance for conversion of Soviet military industries into civilian projects, environmental cleanup of sites contaminated by decades of Soviet weapons development, and occupational retraining and housing for decommissioned Soviet Strategic Rocket Forces officers (Schmitt 1991: 12, Hoagland 1991: A21, Lancaster 1991: A1, Lugar 2005: 13, Combs 1997: 42).

the uncertainty. Therefore, having an assistance programme in place to offer the three newly independent states financial and technical support was important. It can be argued that a newly created assistance programme – CTR – facilitated the denuclearisation of Belarus, Kazakhstan, and Ukraine through four key dynamics. First, it played a role in adapting the pre-existing START Treaty. Second, it assisted in the creation of the Lisbon Protocol and the Trilateral Agreement.[176] Third, it facilitated Belarus, Kazakhstan and Ukraine's decision to ratify the NPT between 1993 and 1994. Fourth, it assisted the removal of all Soviet nuclear warheads from the three states in 1995–1996.[177] Since this thesis stresses the importance of the CTR Program in the denuclearisation of the three states, this chapter first examines how the CTR Program came into existence and second, explores how the epistemic community influenced U.S. national decision makers to implement the CTR Program as policy.

The chapter is structured in three parts. The first section examines the role of the American-Soviet/Russian epistemic community in the creation of the CTR Program. The second section analyses why the CTR Program was important in the denuclearisation of Belarus, Kazakhstan, and Ukraine based on the four distinct dynamics highlighted above. The chapter concludes with a discussion on recounting the importance of applying the epistemic community framework to the creation of the CTR Program.

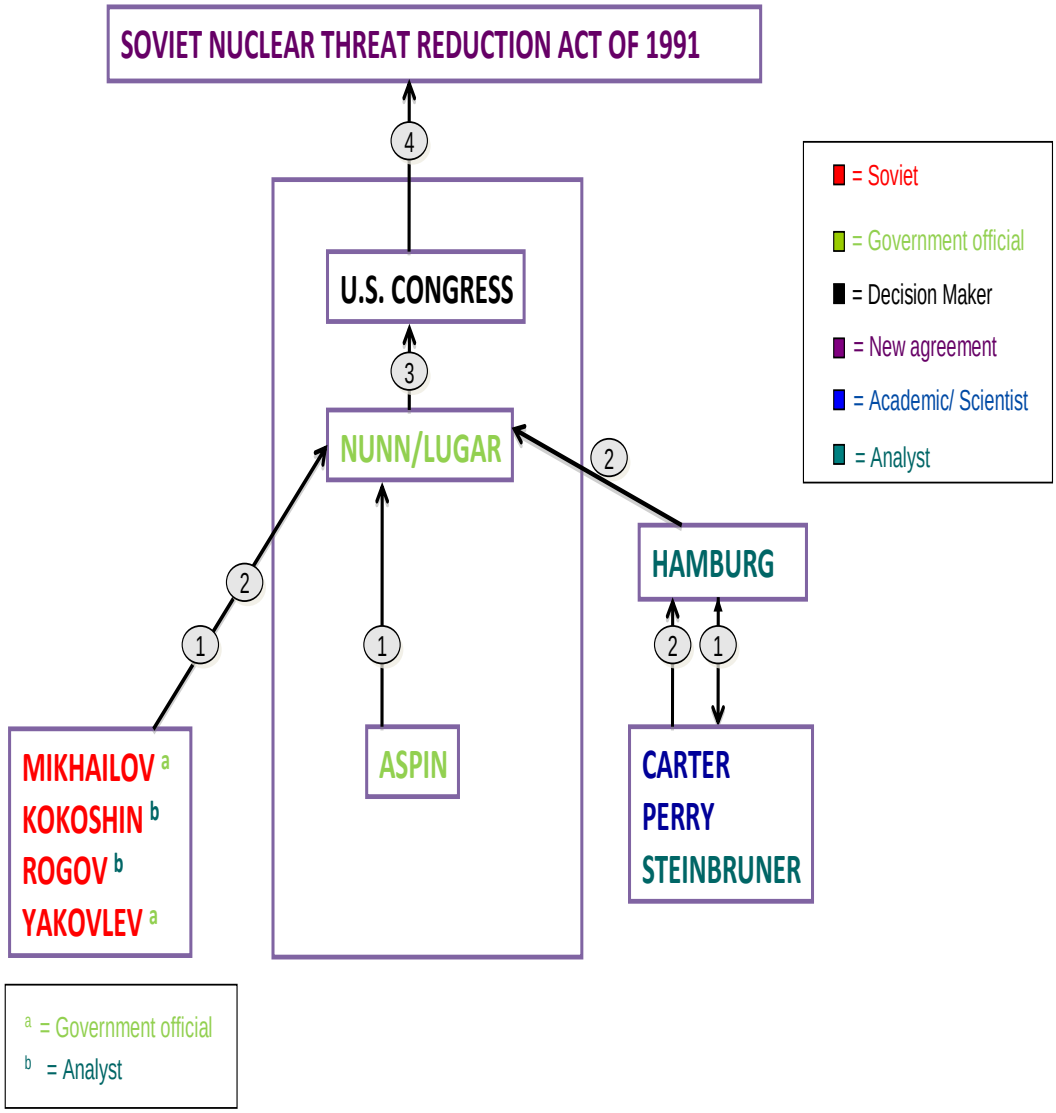
[176] The Lisbon Protocol was a follow-up to the START Treaty in which Belarus, Kazakhstan, and Ukraine pledged to become non-nuclear weapons states. Formerly known as the Protocol to the Treaty between the U.S.A. and the USSR on the Reduction and Limitation of Strategic Offensive Arms, it was concluded on May 23, 1992. The Trilateral Agreement was signed between the Presidents of the U.S., Russia, and Ukraine (Bill Clinton, Boris Yeltsin, and Leonid Kravchuck) in Moscow on 14 January 1994 in which Ukraine promised to eliminate all nuclear weapons in exchange for compensation and security guarantees.
[177] It should be noted that there were other CTR Program accomplishments, which are still in existence today, including helping improve fissile material protection, control and accounting (MPC&A) procedures and technologies, and lab-to-lab exchanges.

7.1 How did an American-Soviet/Russian Epistemic Community Facilitate the Creation of the CTR Program and Influence its Implementation?

As indicated in the previous chapter, many scholars and policy analysts agree that the most important achievement of the CTR Program was the denuclearisation of Belarus, Kazakhstan, and Ukraine (Woolf 1996, Combs 1997, Duffy 1997, Gottemoeller 1997, Orlov 1997, Potter & Shields 1997, Lugar 1999; 2001, Ellis 2001, Newman 2001, Daughtry 2004, National Academies 2004). This is because it provided technical and financial assistance – both of which were needed and requested from the three new nuclear republics. In this section, I examine how – notably through the role of knowledge and expertise and having access to decision makers – the American-Soviet/Russian epistemic community facilitated the creation of the CTR Program and its subsequent implementation as policy.

As discussed in Chapter Two, the epistemic community framework has been used to empirically study the role and impact of ideas in International Relations in relation to the creation of new international policies (Haas 1992a). Adler and Haas argue that an epistemic community influences state decisions through the following four processes: policy innovation, policy diffusion, policy selection, and policy persistence (Adler and Haas: 375–387). Based on my understanding and research on the creation of the CTR Program and in using Adler and Haas' four influencing processes, Figure 7.1 puts forth one possible model illustrating how the American-Soviet/Russian epistemic community influenced U.S. state decision makers to implement the CTR Program as policy.

Figure 7.1:
The Evolution of the CTR Program via the Epistemic Community



KEY:

1 = Policy Innovation
2 = Policy Diffusion
3 = Policy Selection
4 = Policy Persistence

During the first stage, policy innovation (marked by 1 in Figure 7.1), members of the American-Soviet/Russian epistemic community used the issues of international security and the threat of further nuclear weapons proliferation to frame the CTR Program. During the second stage, policy diffusion (marked by 2 in Figure 7.1), members of the epistemic community participated in periodic meetings where they engaged in a mutual exchange of information, regular scientific and technical consultative exchanges, and participated in discussions surrounding the nature of the technical and financial assistance programme. During the third stage, policy selection (marked by 3 in Figure 7.1), the roles of David Hamburg and Senators Nunn and Lugar were especially important since Hamburg connected the senators to the non-governmental experts (e.g., Carter, Perry, and Steinbruner), and the senators – having heard from the Soviet/Russian experts – presented the experts' proposals to the U.S. Congress. After the U.S. Congress passed the Soviet Nuclear Threat Reduction Act of 1991, policy persistence, the final stage (marked by 4 in Figure 7.1), was marked by the subsequent implementation of the CTR Program. These influence mechanisms were facilitated by members of the epistemic community's knowledge and access to decision makers, which will be considered in turn below.

a) The Role of Knowledge and Expertise

The role of knowledge and expertise was arguably a crucial factor in the creation of the CTR Program. Members of the epistemic community used their authoritative claim to policy-relevant knowledge to frame the policy in terms of national security. Their authoritative claim to policy-relevant knowledge can be ascertained by their institutional affiliations and work experience. Dr. Les Aspin (D–WI), a member of the U.S. House of Representatives since 1971 and Chairman of the House Committee on Armed Services from 1985–1993, was widely recognised as a leading authority in defence issues. Senator

Sam Nunn (D–GA), a member of the U.S. House of Representatives since 1968 and Chairman of the Senate Armed Services Committee from 1986–1995, had for decades been preoccupied with non-proliferation issues, especially regarding issues relating to managing nuclear risks.[178] Similar to Nunn, Senator Richard Lugar (R–IN), was deeply engaged in international security and non-proliferation issues and concerned about developments in the Soviet Union. Widely respected in the foreign policy arena, Lugar was a senior Republican on the Senate Foreign Relations Committee (Chairman between 1985 and 1987), and therefore in a position to provide bipartisan leadership on the question of providing financial assistance to Moscow (Bernstein and Wood 1991: 6). Dr. Ashton B. Carter was a former Director of the Center for Science and International Affairs at Harvard's Kennedy School of Government and from 1991–1993, served as a member of the Defense Science Board (established in 1956), a committee of civilian experts appointed to advise the U.S. Department of Defense on scientific and technical matters. During the autumn of 1991, he was leading a research team at Harvard that were analysing the control of the Soviet nuclear arsenal in a disintegrating Soviet Union. Dr. William J. Perry was co-Director of the "Preventive Defense Project" at Stanford's Center for International Security and Cooperation, who during the autumn of 1991 was leading a research team that were analysing the giant military-industrial complex of the Soviet Union (Carter and Perry 1999). The Harvard and Stanford projects were parallel to another project being run at the Brookings Institution under the directorship of Dr. John D. Steinbruner, a renowned foreign policy analyst and academic who was Director of the Foreign Policy Studies Program at the Brookings Institution from 1978–1996. These projects were on a broader agenda they called "Cooperative Security" which were funded by Dr. David A. Hamburg, President of the Carnegie Corporation of New York

[178] Bernstein and Wood (2010: 2) note that Nunn's discovery in the early 1970s of serious deficiencies in the security of U.S. tactical nuclear weapons based in Europe was a "formative experience that left him

between 1983 and 1997, a renowned physician and scientist. Deputy Minister of Atomic Energy and Industry Dr. Viktor Mikhailov, a full member of the Russian Academy of Sciences, was a former director of the Institute of Strategic Stability of the Russian Federal Agency for Nuclear Power, and an expert advisor of the Russian Federal Nuclear Centre at the Research Institute of Experimental Physics. Gorbachev emissary and senior advisor Aleksandr N. Yakovlev, a Soviet politician and historian and member of the Politburo and Secretariat of the Communist Party of the Soviet Union, was widely considered to be the intellectual force behind Gorbachev's reform programme of *glasnost* and *perestroika* (Myers 2005: B8, Steele 2005: 33). Dr. Andrey A. Kokoshin and Dr. Sergey M. Rogov both held senior positions in the Russian Academy of Sciences' Institute for the U.S.A. and Canadian Studies, a well-respected think tank/research institute in Moscow.

As explained in the previous chapter, soon after the failed August 1991 coup, Aspin (1991a) proposed a U.S. humanitarian assistance programme for the Soviet Union to provide food and medicine for the Soviet people for the coming winter in order to prevent chaos in the Soviet Union. Such chaos, he said, could

> Create a new kind of nuclear danger. Civil war in a country with 30,000 nuclear weapons is too grim a prospect to contemplate. And there are the additional possibilities of seizure of weapons by terrorists or sale of weapons on a nuclear black market (1991a: 2).

He acknowledged, that given the uncertainties, it was,

> A whole different kind of threat […] a threat of the United States being obliterated by large numbers of Soviet weapons. What we're talking about now is Soviet weapons falling into hands of people who might use them as blackmail, who might use them as part of an attempt to establish independence for one republic or another (1991b: 10).[179]

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thoroughly shaken and committed to critically examining the safeguards that had – and had not – been in place to reduce the risks attending the deployment by both sides of many thousands of nuclear weapons".

[179] A few months later, Aspin explained that his assistance programme was not foreign aid, but defence spending. In a speech to the Chicago Council on Foreign Relations on 16 December 1991, he said, "We continued to make the argument that this was not foreign aid; it was hard-headed, self-interested defense spending. Helping a hungry person is a good thing to do, but helping a hungry person who has a nuclear weapon is also in our national security interest" (1991e: 256).

Joining forces with Senator Nunn, Aspin proposed spending $1 billion to provide emergency assistance to the Soviet Union. In a *Washington Post* op-ed, Nunn (1991a) encouraged the U.S to help the Soviet Union and the republics dismantle their military-industrial complex through a variety of programmes as a way in which to enhance U.S. national security. He concluded,

> This is not the time to issue blank checks; it is time for a helping hand. Any U.S. assistance to the peoples of the former Soviet Union, including humanitarian aid, should be carefully conceived and executed to improve their lives, to foster democracy and a market system and to reduce the threat to our security (1991a: C7).

In defence of their proposal, Nunn argued,

> Today we have an opportunity to invest wisely in a modest program that could produce dramatic dividends. […] We also have the option of sitting on our hands and doing nothing, in the full knowledge that by doing so we will greatly magnify the threats against which future U.S. defense budgets and defense postures will have to respond for years to come" (quoted in Dewar 1991: A18).

However, this initiative was strongly criticised "from both left – we have our own homeless problem – and right – why should we help the Commies?" (Interview VII), forcing Aspin and Nunn to scrap their proposal.

At the same time however, the "Cooperative Security" Project was researching how to improve the security of the Soviet nuclear arsenal. The Harvard study concluded that the U.S., and indeed the rest of the world, were faced with three dangers in relation to the command and control of the disintegrating Soviet nuclear arsenal. It argued,

> [The control of the nuclear weapons being dispersed in whole or in part] would create the danger that the ultimate disposition of the Soviet arsenal among those structures will lack elements that have been necessary to assure its safe custody and international nuclear stability (ii; 35–47).
>
> Nuclear weapons, components of nuclear weapons, or intimate knowledge about nuclear weapons will fall into unauthorised hands through desertion or mutiny of military custodians, seizure by political groups or terrorists, sale, or smuggling (ii; 36–40).
>
> As nations and terrorist groups outside the Soviet Union seek to obtain nuclear weapons, fissionable material, or difficult-to-obtain weapon components from a chaotic Soviet weapons complex through theft or sale, or as weapons scientists

> from the Soviet Union sell their knowledge to nations like Libya, North Korea, or Iran (ii–iii; 41–42).

As shown in Chapter Six, the Harvard study and the wider "Cooperative Security" Project was brought to the attention of Senators Nunn and Lugar. The study provided the "knowledge" of the issue at hand and lent empirical and analytical weight to the argument Nunn (and to some extent Aspin) had been making earlier. Further, it validated the urgency Nunn attached to the need to adapt policy to confront the security dangers that political turmoil in the Soviet Union posed (Bernstein and Wood 2010: 6). The report provided substantial background information on the entire Soviet nuclear weapons enterprise, including the nuclear command and control system. As the authors noted,

> Dangers of the illicit diversion of key weapon-related technology do not end with the non-strategic and strategic deployments alone but extend to fissionable materials, components, delivery systems, and command and control systems (Campbell et al. 1991: iii).

The point they made was clear; that the nuclear security and proliferation risks emanating from the disintegrating Soviet Union was complex. The challenge did not only involve the "loose nukes" but also the safe protection of Soviet (and post-Soviet) nuclear weapons during a period of political transition. As Nunn remarked,

> This was a timely study, supported by the Carnegie Corporation, that outlined in an analytical, scholarly format the dangers of nuclear command, control, and safety in an unstable Soviet Union (1997: xvi–xvii).

In addition, Senators Nunn and Lugar heard from the Soviet visitors to Washington (Mikhailov, Kokoshin, Rogov, and Yakovlev) that the Soviet Union needed U.S. assistance in safely securing and dismantling the Soviet nuclear arsenal. Through their knowledge and expertise, these experts reinforced the national security frame by shifting the discourse from humanitarian aid (initially proposed by Aspin and Nunn) to a national security imperative. Using the proposals suggested by the epistemic community, Senator Nunn explained to the U.S. Senate,

> This is major legislation. I consider this amendment that we have just sent to the desk a very important amendment, perhaps as […] one of the most important amendments in terms of our national security, indeed the security of the world, that has been before this body in many years.
>
> We are on the verge of either having the greatest destruction of nuclear weapons in the history of the world or the greatest proliferation of nuclear weapons, nuclear materials, and scientific know-how on how to make these weapons, as well as chemical weapons, ballistic missiles, even biological weapons the world has ever seen.
>
> This legislation embodies a new approach to enhancing our national security.[…] I cannot think of a better way to help the American people than reducing the potential military threat that we will have to face in the years ahead – not just in the former Soviet Union but potentially around the world (1991b: 10–11; 13).

Lugar's address further enhanced the national security message conveyed by Nunn, as he said,

> This is not foreign aid; our amendment is part of a national security package.
>
> The obvious advantage of substantial Soviet denuclearisation is that it would eliminate a major portion of the nuclear threat to United States security and survival, as well as that of its allies (1991: 15).

Based on the above, it can be inferred that the failed Aspin-Nunn initiative, the "Cooperative Security" Project – particularly the Harvard study – and the Soviet visitors to Washington D.C., contributed to the creation of The Soviet Nuclear Threat Reduction Act of 1991. Although the initial assistance programme proposed by Aspin and Nunn focused on humanitarian aid, the "Cooperative Security" Project and the Soviet visitors to Washington D.C. asking for U.S. assistance, provided and reinforced the national security frame, thereby shifting the discourse from humanitarian aid to a national security imperative. The policy innovation, denoted by (1) in Figure 7.1., was the idea of providing technical and financial assistance to the former Soviet Union states to dismantle their inherited nuclear weapons. By framing the issues of preventing proliferation and assisting in the denuclearisation of the three new republics within the U.S. national security interest (and the implied interest of the entire international community), members of the epistemic community contributed to policy innovation. Aspin's original aid package was immediately denounced as "foreign aid" in spite of his

claims that this package was "defence by other means". Nunn and Lugar, in their op-ed and in their addresses to the Senate, clearly enunciated that offering assistance to the Soviet Union was not charity, but in the U.S. national security interest. By framing the issues in the (U.S./international) security interest, members of the epistemic community successfully guided decision makers by clarifying the issue of the command and control of the Soviet nuclear infrastructure and resolving the international security problem of further nuclear weapons proliferation.

In addition, it can be argued that the experts behind the creation of the CTR Program used their policy relevant knowledge in the area of nuclear weapons proliferation in order to effectively frame the issue of securing former Soviet nuclear weapons in the U.S. national security interest. As two interviewees argued, the "Nunn-Lugar idea came from academics", and that "non-governmental thinking undergirded the thought process of CTR" (Interviews I and V). Through the Harvard study, the overall "Cooperative Security" project, and Nunn and Lugar's extensive engagement with the issue, Aspin's failed "broader humanitarian effort was morphed to a narrower national security initiative" (Interview VII). Moreover, it can be argued that the experts' knowledge was diffused, particularly through communication and publications: in addition to the Soviet visitors to Washington, the Harvard study, Nunn and Lugar's op-eds, the "Cooperative Security" Project, the November 1991 meetings convened by Nunn and Lugar (discussed in the previous chapter), the uncertainty over the command, control, and safety of Soviet nuclear weapons was the policy being diffused.

It should be noted that there was greater diffusion activity in the U.S. than in the Soviet Union. Although the experts behind the creation of the CTR Program were mainly from the U.S. and diffusion mainly took place within the U.S., the Soviet/Russian component cannot be overlooked. Four of the 11 epistemic community members were Soviets/Russians (Kokoshin, Mikhailov, Rogov, and Yakovlev). Their visits to

Washington in October/November 1991 asking the U.S. for technical assistance played a part in the diffusion process, denoted by (2) in Figure 7.1. It is quite possible that there was not as much engagement on the issue in the Soviet Union as there was in the U.S. because the Soviets were more concerned with the dissolution of their "Empire". According to Vladimir A. Orlov, Director of the Center for Policy Studies in Russia (PIR Center), the CTR issue had never been debated publicly in Russia. Furthermore,

> No press release on the CTR Program has ever been published and distributed to the central media by Russian authorities. The only place in Moscow where interested journalists can find adequate information about CTR Program implementation is the U.S. Embassy, and only one newspaper, *Kommersant Daily*, provides more or less regular information about CTR developments. […] With a few exceptions, Russian NGOs and research centers generally have paid little attention in their research programs to CTR implementation in Russia (1997: 87; 99).

b) Access to Decision Makers

The second important stage of the epistemic community's influence was marked by the non-proliferation experts' access to decision makers. According to Interview VII,

> Without the ready availability of the project's [*Soviet Nuclear Fission*] early findings and analytical support, Congress may not have had the content with which to fill its legislative response to a very real and dangerous problem, but without the wisdom and legislative skill of Nunn, Lugar, Aspin and others, we at CSIA [Harvard Center for Science and International Affairs] would certainly never have been bring our ideas into law or policy. And of course, without a platform of established prior relationships among the principal actors, these two elements may never have connected at all.

After publishing the Harvard study, Carter remarked, "We had the study but not yet the audience of people in power who shared our concern" (2005: 1). At that stage, the academics did not have direct access to government officials. The "prior relationships" mentioned by Interview VII (a former Special Coordinator for Cooperative Threat Reduction at the U.S. Department of Defense) above therefore serve as a very important aspect in understanding the successful creation of the CTR Program. David Hamburg's role within the epistemic community as the key "connector" was instrumental, as he provided access for the academics and analysts to government

officials. He introduced the non-governmental experts (Carter, Perry, and Steinbruner) to both Senators Nunn and Lugar at a pivotal meeting in mid November (discussed in the previous chapter), thereby granting the experts access to government officials and fusing knowledge with policy.

Interviewees remarked on the importance of Hamburg in facilitating the CTR Program. Interview XVI described him as the "principal instigator" of the meeting. According to Interview VII, "This meeting connected Nunn and Lugar to Carter, Perry, and Steinbruner to brief Nunn and Lugar on "Cooperative Security", a book that was being written by Carter, Perry, and Steinbruner". As Carter and Perry wrote in their memoirs of the birth of the Nunn-Lugar Program,

> Hamburg had a knack for bringing the right people together at the right time to work on the right problems, stimulating common thoughts and common action. Through the Carnegie Corporation of New York, a foundation devoted to peace and education, Hamburg and his associate Jane Wales had for many years supported exchanges and discussions between Soviet and American scholars and officials, even through the darkest days of the Cold War. We had participated in many Carnegie-sponsored meetings and had frequently met with Senator Nunn and Senator Lugar through these meetings (1999: 71).

Furthermore, another interviewee stressed that Hamburg's "personal relationships" and "trust" were very important in connecting the non-governmental experts to Senators Nunn and Lugar (Interview XXV). It should be noted that the personal relationships were not only limited to the U.S. experts. Senators Nunn and Lugar had equally formed personal relationships with Soviet experts (both governmental and non-governmental) over the years. This can be seen from the Soviet visitors' trips to Washington (at meetings where Nunn and Lugar were present, discussed in the previous chapter) and from following statements from Nunn and Lugar:

> I also have had enough conversations with a number of people in the Soviet Union coming from different aspects and a number of people in the Russian Republic, including democratic reformers (Nunn 1991b: 23).

> As the Soviet Union began to break apart in 1991, mutual acquaintances on the Russian side, including some from the military, came to former Senator Sam

> Nunn of Georgia and me and pointed out the dangers of the dissolution of a nuclear superpower (Lugar 1999: 52).[180]

On 25 November 1991, Nunn and Lugar presented the assistance package to the Senate, using the expert advice offered from members of the epistemic community during the previous policy framing and innovation stages. The Senate voted 86–8 in favour of the bill and the next day, the House followed suit, authorising $500 million in aid to the Soviet Union. With the passing of the Soviet Nuclear Threat Reduction Act of 1991 by Congress, denoted by (4) in Figure 7.1., this act was subsequently signed into law by President George H. W. Bush on December 12, 1991, and over the following years came to be known as the Cooperative Threat Reduction Program, which is still in existence today.[181]

Based on the above, it can therefore be argued that the roles of David Hamburg and Senators Nunn and Lugar were especially important in policy selection, denoted by (3) in Figure 7.1. As explained in Chapter Two, the extent of an epistemic community's role in policy selection involves two factors: decision makers' unfamiliarity with policy issues and the timing of policy choice (Adler and Haas 1992: 381–383). In the case of the initial December 1991 CTR legislation, U.S. decision makers did not solicit advice from an epistemic community, but instead, the epistemic community, using their expertise in nuclear (non) proliferation, offered their suggestions in order to assist the newly independent states with the elimination or reduction of the nuclear weapons. The second factor in assessing an epistemic community's role in policy selection involves *timing*

[180] It should also be noted that by the 1970s/1980s, the U.S.-Soviet relationship had evolved into a "special" relationship as nuclear superpowers. In the 1970s and 1980s, the two superpowers implemented many major bilateral and unilateral arms reduction treaties and agreements. These included the 1972 and 1979 Strategic Arms Limitation Talks (SALT I and II), the 1972 Anti-Ballistic Missile Treaty (ABM) the 1987 Intermediate-Range Nuclear Treaty (INF), the 1990 Conventional Armed Forces Treaty in Europe (CFE), and the 1991 Strategic Arms Reduction (START) Treaty.

[181] Please note the other accomplishments of the CTR Program have not been included in this analysis, due to this thesis' main research agenda of exploring the role of epistemic communities in creating cooperative nuclear non-proliferation agreements. Some of these accomplishments include: helping improve fissile material protection, control, and accounting (MPC&A) procedures and technologies, and lab-to-lab exchanges.

(Adler and Haas 1992: 383). It may be easier for decision makers to accept ideas and advice from epistemic communities after political, military, or economic conditions have changed (Adler and Haas 1992: 383). In the case of the CTR Program epistemic community, timing was important, especially the dissolution of the Soviet Union. The impending collapse of the Soviet Union prompted fears over the command and control of 27,000 Soviet "loose nukes" amongst the members of the epistemic community. While the U.S. government did not initially solicit advice from the epistemic community, it is clear that the dissolution of the Soviet Union prompted government decision makers to take action. Soon after the August 1991 attempted coup while the Soviet Union was still in existence (albeit beginning to collapse), Aspin and Nunn's humanitarian aid proposal was immediately rejected. Yet, by December 1991, the Soviet Union had dissolved, prompting government decision makers to accept the epistemic community's proposals and implement a technical and financial assistance programme to the three new nuclear independent states.

7.2 The Importance of the CTR Program in the Denuclearisation of Belarus, Kazakhstan, and Ukraine

Having analysed how the CTR Program came into existence, it is important to reflect on how it facilitated the denuclearisation of Belarus, Kazakhstan, and Ukraine. Initially, all three states had indicated that they wanted their inherited Soviet nuclear weapons removed, yet by late December 1991/Spring 1992, their position towards their inherited nuclear weapons changed. While Kazakhstan and Ukraine insisted on wanting to maintain the nuclear weapons, Belarus was the least contradictory since it had consistently maintained its desire to be nuclear weapon free.[182] The CTR Program was therefore able to provide both a financial incentive and technical assistance for the three

[182] This was mostly due to the April 1986 Chernobyl nuclear reactor accident (discussed below).

new republics to denuclearise. In addition, it prompted the signature of "umbrella" agreements with the new republics, facilitated the creation of the Lisbon Protocol and the Trilateral Agreement, and played a part in each country's decision to ratify the NPT, culminating in their denuclearisation (illustrated in Table 7.1).[183] According to Gloria Duffy, former Deputy Assistant Secretary of Defense and Special Coordinator for CTR,

> CTR played a unique role in opening up communication and establishing a base for the relationship between the U.S. and the countries of the former Soviet Union. In the cases of Ukraine, Belarus, and Kazakhstan, the Nunn-Lugar program negotiations and discussions were essentially the first in-depth direct channel of communication begun between these governments and Washington (1997: 26).

Table 7.1:
The CTR Program's Accomplishments

Umbrella Agreements:	17 June 1992: U.S. & Russia 22 October 1992: U.S. & Belarus 25 October 1993: U.S. & Ukraine 13 December 1993: U.S. & Kazakhstan
Lisbon Protocol/START I:	23 March 1992: Lisbon Protocol 2 July 1992: Kazakhstan ratifies START I 1 October 1992: U.S. ratifies START I 4 November 1992: Russia ratifies START I 4 February 1993: Belarus ratifies START I 5 December 1994: Ukraine ratifies START I
NPT Accession:	22 July 1993: Belarus 14 February 1994: Kazakhstan 5 December 1994: Ukraine
Removal of all nuclear weapons:	24 April 1995: Kazakhstan 1 June 1996: Ukraine 27 November 1996: Belarus

[183] Before each implementing CTR agreement could come into effect, "umbrella" agreements had to be signed with each prospective recipient country. Ellis explains that "the legal framework established by the umbrella agreements provided protection from customs fees, taxes, liabilities for the U.S. government, employees, contracting personnel, and so forth" (2001: 138, footnote 47).

Belarus, Kazakhstan, and Ukraine's Position on Nuclear Weapons

As explained earlier, as new independent nuclear successor states, Belarus, Kazakhstan, and Ukraine were not bound by pre-existing Soviet arms control agreements that committed the Soviet Union to unilaterally reduce its nuclear weapons arsenal (e.g., the NPT and START I). Therefore, Belarus, Kazakhstan, and Ukraine were not under any legal obligation to renounce their nuclear weapons. In addition, as stated above, it was not entirely clear what Belarus, Kazakhstan, and Ukraine had each planned to do with their inherited nuclear weapons. On the one hand, they insisted on owning the nuclear weapons and, on the other hand, they insisted on wanting to become nuclear weapon-free.

Initially, all three states had indicated that they wanted their inherited Soviet nuclear weapons removed in order to establish themselves as nuclear-weapons-free states (Miko and Goldman 1992: 8). Yet, by December 1991/Spring 1992, their position towards their inherited nuclear weapons changed. Russian President Boris Yeltsin announced on 16 December 1991 that control over the Soviet nuclear arsenal would be in the hands of the four nuclear republics and the Supreme Commander-in-Chief (quoted in Kim 1992: 15); Kazakh President Nursultan Nazarbaev said on 17 December 1991 that Kazakhstan would not give up all its nuclear weapons if Russia maintained its nuclear weapons (quoted in Kim 1992: 15–16); and Serhiy Holovaty, a member of the Ukrainian parliament's commission for foreign affairs said on 7 January 1992, "We would never give up the nuclear weapons now" (quoted in Skootsky 1995: 68). Such contradictory statements – discussed in greater detail below – did not reassure the international community's increasing anxieties regarding further nuclear proliferation.

a) Belarus

Out of the three new nuclear republics, Belarus's position on nuclear weapons remained unchanged. It was the most motivated and consistent in wanting to eliminate its inherited nuclear weapons. In July 1990, the Belarusian Supreme Soviet adopted a declaration which established that Belarus would be a nuclear-free state (Reiss 1995: 129). Belarus' main objections to nuclear weapons stemmed from the April 1986 Chernobyl nuclear reactor accident, in which large parts of Belarus were badly contaminated with various levels of radioactivity (Interview XIV). In fact, at a meeting in Minsk, on 18 December 1991, Belarusian President Stanislau Shushkevich told U.S. Secretary of State James Baker that the Belarusian public, having experienced the trauma of Chernobyl, "it was essential to get all nuclear weapons off Belarus territory" (Baker 1995: 582).

In addition, from a national security perspective, Belarusian leaders believed that the presence of nuclear weapons on their territory would invite nuclear attacks against their country if a war erupted in the region (Reiss 1995: 135). In fact, no one in a senior policymaking position advocated maintaining the nuclear weapons (Reiss 1995: 138). Further, President Shushkevich asked Baker for U.S. expertise in disabling and dismantling the nuclear weapons within Belarus (Baker 1995: 582).

b) Kazakhstan

Unlike Belarus, who was consistent in its desire to be a non-nuclear weapon state, Kazakhstan went backwards and forwards on the issue. On the one hand, it maintained its desire to become a non-nuclear weapon state, and on the other hand, it wanted to be considered a "temporary" nuclear weapon state. In the words of a political commentator who followed Kazakhstani politics closely, "Kazakhstan had never been a nuclear republic. It was merely a testing site" (Ustiugov 1993: 34). From 1949–1989, 466 nuclear explosions occurred at a site in Kazakhstan, near the city of Semipalatinsk. Of these 466

explosions, 26 were above ground, 90 were atmospheric, and 350 were underground (Kianitsa 1993: 37).[184] As a result of 40 years of nuclear testing, among the area's inhabitants, leukaemia became widespread and babies were born with neurological and physical defects (Conway 1994: 166). In light of Semipalatinsk's legacy, it was not surprising to hear Nursultan Nazarbayev – who would later become president of the independent republic of Kazakhstan – publicly voicing his opposition to the tests in 1989 when he became First Secretary of the Kazakhstan Communist Party (Kianitsa 1993: 38). Two years later, as president of Kazakhstan, Nazarbayev closed the site and demanded compensation for health problems caused by the nuclear testing (Copley 1994: 614). On 17 December 1991, during U.S. Secretary of State Baker's visit to the country's capital, Alma Ata, Nazarbayev told Baker,

> If the international community recognises and accepts Kazakhstan, we will declare ourselves a non-nuclear state. This is the best way that our territorial integrity will be assured. That's what we require (quoted in Baker 1995: 581).

What were surprising, however, were Alma Ata's subsequent announcements on nuclear weapons because by spring 1992, Nazarbayev's position appeared to have shift. He told a delegation from the Conference on Security and Cooperation in Europe that Kazakhstan ought to be considered a "temporarily nuclear state" (quoted in Ustiugov 1993: 35). The reasons why Kazakhstan wanted to initially retain the nuclear weapons were two-fold. First, it was afraid of a resurgent Russian imperialism and claimed that a nuclear deterrent might dissuade any provocation that might emanate from Moscow. Second, it claimed that without nuclear weapons, their country would become a weak and vulnerable state situated between two nuclear armed powers, Russia and China (Lepingwell 1993a: 59).

[184] This site was chosen by the Soviet government in 1949 as the location for the research, development, and testing of nuclear weapons (Conway 1994: 166).

In addition to its contradictory nuclear posture, Kazakhstan reneged on its commitments to the Alma-Ata Agreement of 21 December 1991. This agreement was a declaration on joint measures on nuclear weapons signed by the Presidents of the four new nuclear republics: Yeltsin of Russia, Shushkevich of Belarus, Nazaerbayev of Kazakhstan, and Kravchuk of Ukraine. Upon signature, all nuclear-inheriting countries states agreed to the following four measures. First, that any use of nuclear weapons would occur only with their joint agreement; second, that Belarus, Kazakhstan, and Ukraine would join the NPT as non-nuclear weapons states; third, that the parties to the agreement would not be the first to use nuclear weapons; and fourth, that Belarus, Kazakhstan, and Ukraine would withdraw all of the non-strategic nuclear forces (i.e., the tactical nuclear weapons) on their territories back to Russia by 1 July, 1992 (quoted in SIPRI 1992: 562, Ellis 2001: 6).

Kazakhstan refused to agree to Russia being the only one owner of the nuclear components of dismantled missiles and strategic nuclear forces (Ustiugov 1993: 35). It refused to accede to the NPT as a non-nuclear weapon state (Lepingwell 1993b: 5), and it refused to eliminate all strategic nuclear weapons located on its territory by the end of 1994 (Reiss 1995: 141).[185] Asked in May 1993 why it was taking so long to remove the nuclear weapons out of Kazakhstan, Nazarbayev answered,

> Dismantlement and destruction of silo-based multiple-warhead missiles is a labour intensive process, which requires complicated technical decisions and considerable financial means not available in the republic at this time. This explains why Kazakhstan is behind schedule in transferring nuclear weapons out of Kazakhstan (quoted in Ustiugov 1993: 36).

Similar to Belarus, Kazakhstan needed technical and financial assistance for the removal and destruction of its nuclear weapons. Through the CTR Program, such assistance was provided, after which Kazakhstan reverted to its initial anti-nuclear weapon stance.

[185] Acceding to the NPT was a precondition for signing the START Treaty.

c) Ukraine

Similar to Kazakhstan, Ukraine toyed with the idea of maintaining the inherited nuclear weapons and insisted on becoming a nuclear weapon-free state at the same time. During the first few months of Ukraine's new independence, a broad spectrum of views emerged on nuclear policy, ranging from a real desire to become a nuclear weapon state to a passionate aversion to all things nuclear, resulting from the Chernobyl disaster (Keeny 1992: 2). In fact, out of the three new nuclear republics, Ukraine changed its mind so often about the former Soviet nuclear weapons on its soil that it not only "confused the rest of the world, but also itself" (Kiselyov 1993: 7).

Initially, Ukraine was intent on relinquishing its nuclear weapons immediately. Soon after the August 1991 coup, Ukraine announced that it intended to be nuclear weapons-free, having suffered the Chernobyl disaster (Kiselyov 1993: 7). In October 1991, the Ukrainian parliament adopted a declaration "On the Nuclear Status of Ukraine" in which it stated that the nuclear weapons based on Ukrainian territory were temporary and that Ukraine intended to completely eliminate the nuclear weapons and components from its territory. Further, when Ukrainian President Kravchuk hosted U.S. Secretary of State Baker in Kiev on 17 December 1991, he said that Ukraine would abide by all nuclear agreements and treaties and accede to the NPT. In addition, Ukraine would "welcome U.S. expertise to assist in the safe storage, transfer, and destruction of its nuclear forces" and that nuclear forces on its territory would be "inactivated" (quoted in Baker 1995: 583). Through its commitments to the 1991 Alma Ata Declaration, Kiev agreed to the removal of all tactical nuclear weapons from its territory by 1 July, 1992 and all strategic weapons by 1994. Such pledges seemed to confirm its non-nuclear weapons position.

Soon after the Alma Ata Declaration, Russia began removing tactical nuclear weapons from Ukraine. By late February 1992, a substantial amount of these weapons

had been withdrawn (Reiss 1995: 94). However, on 12 March, Ukraine suddenly stopped shipping tactical nuclear missiles to Russia. Kravchuk stated that he had suspended the withdrawal of tactical nuclear weapons from Ukraine because Ukraine "cannot guarantee that weapons transported to Russia will be destroyed or that they will not fall into undesirable hands" (quoted in Lockwood 1992: 19). Kravhcuk's announcement was clearly a marked contrast from what was agreed through the Alma Ata agreement. However, despite his March 1992 statement, Kravchuk added that Ukraine still intended to eventually become a nuclear weapon free state (Lockwood 1992: 19).

In addition, in early 1992, opposition to Ukrainian unilateral disarmament emerged within the Ukrainian Parliament's (*Rada*) debate on the removal of nuclear weapons from Ukraine (Nahaylo 1993: 32). Rada Deputy Yurii Kostenko consistently argued in favour of keeping the nuclear weapons for an "unstated period" (quoted in Kincade 1993: 13). In addition, Major General Volodymyr Tolubko, a powerful Rada Deputy, continually advocated a nuclear-weapon-state status for Ukraine (Kincade 1993: 13). Tolubko was formerly of the Soviet Strategic Rocket Forces.[186] Three reasons accounted for why some Ukrainian parliamentarians insisted on retaining the nuclear weapons. First, it seemed unwise to surrender nuclear weapons to Russia – the state that posed the greatest security threat to Ukraine (from a Ukrainian perspective). Second, it seemed imprudent to relinquish the nuclear weapons without securing positive security guarantees from the nuclear powers (Nahaylo 1993: 32). Third, several parliamentarians agreed that if the nuclear arsenal was removed, Ukraine would lose the attention and focus of the international community and therefore not be considered a powerful state (Macilwain 1993: 599).

[186] The Soviet Strategic Rocket Forces operated all Soviet ground-based intercontinental, intermediate-range, and medium-range nuclear missiles with ranges over 1,000 km.

Yet, in spite of these oppositions to unilateral disarmament, the Rada reaffirmed the country's intention to become a non-nuclear weapon state. It established that it was

> Expedient not to transfer tactical nuclear weapons from the territory of Ukraine until the mechanism for international control of their destruction has been worked out and implemented with Ukraine's participation (quoted in Nahaylo 1993: 33).

The "mechanism for international control" for the destruction of the nuclear weapons would be the CTR Program. In order to become a nuclear weapon-free state, Ukraine required technical and financial assistance since it "lacked the means, expertise, and resources to accomplish this" (Bernstein and Wood 2010: 11). In fact, in early May 1992, prior to his visit to Washington, D.C., President Kravchuk emphasised the importance of Western economic and technical assistance to dismantle nuclear weapons (Nahaylo 1993: 33).

Based on the above, Belarus, Kazakhstan, and Ukraine shared several similarities. Apart from inheriting the nuclear weapons and (eventually) pledging to rid them from their respective territories, the three new republics required financial and technical assistance in doing so. Furthermore, in all cases, such assistance was required from and asked of the U.S. Since the August 1991 coup, members of the epistemic community were actively working on concrete policy and technical solutions to these issues that were implemented by the U.S. government as the CTR Program. Over the successive years, "umbrella agreements" – discussed below – were signed between the U.S. and the nuclear-inheriting states before the implementation of the CTR Program could be realised (Ellis 2001: 138, footnote 47).

Umbrella Agreements

Persuading Belarus, Kazakhstan, and Ukraine to become non-nuclear weapon states by voluntarily returning to Russia the strategic nuclear weapons that each inherited was not going to be an easy task. The CTR Program, however, provided the funds to assist in this

endeavour. In order for the CTR Program to be implemented, "umbrella" agreements needed to be signed between the U.S. and the nuclear-inherited states. These agreements addressed the scope of the cooperation and the maximum amount of CTR Program money to be made available for each agreement (Goodby 1995: 2). In addition, they designated the Department of Defense (DOD) as the executive agent for the U.S. government for implementation. In their role as executive agent, DOD officials would sign the implementing agreements for specific projects and programmes (Ellis 2001: 117–118).

The first of such umbrella agreements was signed between the U.S. and the Russian Federation on 17 June 1992. Once the U.S. government had committed $400 million for the dismantling of nuclear (chemical and biological) weapons in the former Soviet Union, it was imperative to get Russia involved in the CTR Program. Russian policymakers were initially sceptical of this cooperative effort as they claimed it "violated Russian sovereignty" (Orlov 1997: 86). According to Interview IX,

> Russian officials, steeped in 70 years of anti-western propaganda, were quite suspicious of U.S. intentions. They would not accept the fact that we [U.S.] would be willing to put up $400 million just to ensure the safety and security of Soviet weapons. Many saw this as an attempt to further "put down" Russia or as an overt spying attempt.

Yet, Russian decision makers knew that Russia needed U.S. funding and technical assistance in their dismantling endeavour (Orlov 1997: 86–87). Colonel-General Evgenii Maslin, head of the 12th Main Directorate of the Russian Ministry of Defence, observed, "We would like to carry out the process of nuclear warhead dismantlement by ourselves, but we should be realists – there is a lack of financial resources in Russia" (quoted in Orlov 1997: 87). In addition, Deputy Foreign Minister Georgii Mamedov said, "Agreements concluded with the U.S. on the Nunn-Lugar fund fully reflect Russia's national interests and meet Russia's concerns" (Orlov 1997: 92). As a result, on 17 June 1992, the U.S. and the Russian Federation signed an umbrella agreement for CTR

Program assistance concerning the safe and secure transportation, storage, and destruction of weapons and the prevention of weapons proliferation. The agreement established the international legal framework for the U.S. providing technical and financial assistance to Russia in three critical areas: destruction, transportation, and non-proliferation. The agreement provided assistance in the *destruction* of nuclear, chemical, and biological weapons; safe and secure *transportation* and storage of those weapons in connection with their destruction; and establishment of additional verifiable measures *against the proliferation* of these weapons (17 June 1992 Umbrella Agreement between the U.S. and the Russian Federation).[187] The umbrella agreement helped Russia deal with the technical and financial challenges it faced as the state responsible for the storage and dismantlement of Soviet nuclear weapons.

Once it was signed with Russia, further U.S. umbrella agreements were signed with the remaining nuclear-inherited states: Belarus, 22 October 1992; Ukraine, 25 October 1993; and Kazakhstan, 13 December 1993 (Skootsky 1995: 71; 82; 79). These agreements provided a legally binding framework to provide material, technical, and financial assistance to eliminate the strategic offensive nuclear weapons deployed on each of the new republics' territory.

START I, Lisbon Protocol, and the Trilateral Agreement

The pre-existing START Treaty signed between the U.S. and the Soviet Union on 31 July 1991 had committed both nations to reduce their strategic nuclear warheads over seven years by 25–35%. But when on 31 December 1991, the Soviet Union officially dissolved, the entry into force of START was delayed. As such, it was important to ensure the transfer of treaty obligations to all relevant parties. While an obvious and practical

[187] The full name of this agreement was "Agreement Between the United States of America and the Russian Federation Concerning the Safe and Secure Transportation, Storage and Destruction of Weapons and the Prevention of Weapons Proliferation". It was signed by Presidents George Bush and Boris Yeltsin in Washington D.C. on 17 June 1992.

solution might have been to regard Russia as the sole legitimate inheritor of the Soviet Union's nuclear arsenal and, therefore, transfer treaty obligations to Moscow alone, the other republics did not find that acceptable. The Lisbon Protocol signed by the U.S., Russia, Belarus, Kazakhstan, and Ukraine on 23 March 1992 became the "compromise solution" (Ellis 2001: 7).

Under the Lisbon Protocol, Belarus, Kazakhstan, and Ukraine would sign the START I Treaty and agreed to sign the NPT as non-nuclear weapons states "in the shortest possible time" (de Andreis and Calogero 1995: 12, Combs 1997: 47). In addition, the heads of state of Belarus, Kazakhstan, and Ukraine pledged to eliminate all the strategic weapons on their territories within the seven-year START reduction period.[188] The Lisbon Protocol therefore committed Belarus, Kazakhstan, and Ukraine to become non-nuclear weapon states and to transfer all strategic warheads to Russia, the funding of which would be covered through the CTR Program (Goodby 2000: 109). Until the weapons were removed from Belarus, Kazakhstan, and Ukraine, they were to remain subject to the "safe, secure, and reliable control of a single unified authority" (Ellis 2001: 7).

In order to enter into force, START I required ratification by all five parties, which took place between July 1992 and December 1994 (see Table 7.1 for further details). The two year delay was due to Ukrainian President Kravchuk's insistence that Ukraine would need U.S. assistance (political and financial) to proceed with the transfer of nuclear warheads to Russia and to complete the elimination of strategic offensive arms in Ukraine (Goodby 2000: 116). According to the U.S. chief negotiator of the Nunn-Lugar umbrella and implementing agreements with Russia, Belarus, Kazakhstan, and Ukraine, President Kravchuk stipulated three conditions before it would agree to START

[188] Both the U.S. and Russia made it a condition of their respective ratifications of START I that each of the five states agree to the treaty's terms before it would enter into force (Ellis 2001: 7).

I ratification.[189] Kravchuk explained that Ukraine wanted security assurances from Russia and the U.S., compensation for the nuclear materials contained in the warheads transferred to Russia (including the tactical nuclear warheads already transferred to Russia in the spring of 1992), and tangible economic and technical support to offset the cost of eliminating strategic offensive delivery systems on Ukrainian soil (Goodby 2000: 116–117).

U.S. security assurances were offered in January 1993, and the compensation and economic support was made available through the CTR Program. According to Goodby,

> Nunn and Lugar, during a visit to Kiev in November 1992, had told Kravchuk that between $100 million and $150 million could be made available to Ukraine from the Nunn-Lugar program for dismantling nuclear delivery systems. Bush wrote to Kravchuk on December 5 1992 promising up to $175 million for assistance to Ukraine from Nunn-Lugar funds (2000: 116–117).

Furthermore, these three elements were the same three that were at the heart of the U.S.-Russian-Ukrainian trilateral agreement concluded by Clinton, Yeltsin, and Kravchuk in Moscow on 14 January 1994. In the Trilateral Agreement, Ukraine promised to eliminate all nuclear weapons in exchange for security guarantees and compensation, which it received from CTR Program funds. As Goodby (1995: 2) argued, the CTR Program played a "vital role" in gaining Ukraine's adherence to this accord, START I, the Lisbon Protocol, and the NPT.

Ratification of the NPT and Removal of All Soviet Nuclear Warheads

One of the ways in which the CTR Program facilitated the denuclearisation of Belarus, Kazakhstan, and Ukraine was its role in encouraging these countries to renounce their nuclear weapons and become non-nuclear weapon state parties to the NPT. As stated earlier, Ukraine and Kazakhstan toyed with the idea of maintaining their inherited nuclear weapons. For example, a statement signed by 162 deputies in Ukraine's Rada declared

[189] James E. Goodby's role as U.S. chief negotiator of the Nunn-Lugar umbrella and implementing agreements with Russia, Belarus, Kazakhstan, and Ukraine was from March 1993–March 1994.

that Ukraine "must confirm its right of ownership of the nuclear weapons that are located on its territory" (Skootsky 1995: 74).[190] Equally, Kazakh President Nazarbayev stated on 3 February 1993 that he could "veto the use of the nuclear weapons located in Kazakhstan" (quoted in Skootsky 1995: 73). In contrast, the Belarusian Parliament proceeded swiftly with ratification of both the START I Treaty (4 February 1993) and the NPT (22 July 1993) mostly in part due to the widespread anti-nuclear sentiment following the Chernobyl disaster of April 1986.

As a quid pro quo, the U.S. government offered considerable CTR assistance to Ukraine and Kazakhstan in return for prompt denuclearisation and ratification of START I and the NPT.[191] According to Gloria Duffy (former Deputy Assistant Secretary of Defense and Special Coordinator for CTR), the example of Ukraine offers the clearest indication of how the availability of assistance made a difference. She argues that the Ukrainian Rada made the receipt of adequate U.S. denuclearisation aid one of the conditions for ratifying START I and the removal of all nuclear weapons from Ukrainian soil.

> Until this condition was fulfilled, START I could not go into effect. Until Ukraine became committed to START, NPT accession was impossible. In Ukraine, from the beginning to end of the process, the relationship between U.S. assistance and denuclearisation was quite clear (1997: 28).

Through CTR Program assistance, by 1996, Belarus, Kazakhstan, and Ukraine had denuclearised and had become non-nuclear weapon states. Having ratified the START I Treaty (by virtue of the Lisbon Protocol) and acceded to the NPT as non-nuclear weapon states by the end of 1994, the next two years saw the massive transportation of nuclear weapons back to Russia, which as Interview XV argued, was "the first and most urgent task of CTR". By 1996, all nuclear warheads inherited from the Soviet Union were removed from the three states' territories. On 24 April 1995,

[190] This statement was signed on 27 April 1993 (Skootsky 1995: 74–75).
[191] The dates of ratification can be seen in Figure 7.1.

Kazakhstan transferred its last strategic weapons to Russia, followed by Ukraine on 1 June 1996, and Belarus on 27 November 1996.

7.3 Conclusion

To conclude, it can be argued that the role of an epistemic community was an important factor in the creation of the CTR Program, an international policy coordination effort which facilitated the denuclearisation of Belarus, Kazakhstan, and Ukraine. The uncertainty surrounding the break-up of the Soviet Union marking the end of the Cold War, coupled with the uncertainty surrounding which state would control 27,000 Soviet nuclear weapons (including Russia's share), encouraged the emergence of the epistemic community. This community comprised a network of American and Soviet/Russian professionals with recognised expertise in the area of nuclear (non) proliferation. In line with the existing studies on epistemic communities, members of this epistemic community comprised of both technical experts (i.e., academics and foreign policy research analysts/specialists) and government/state officials. Carter, Hamburg, Kokoshin, Perry, Rogov, and Steinbruner comprised the former group; while Aspin, Nunn, Lugar, Mikhailov, and Yakovlev comprised the latter group. In addition, both clusters of groupings were especially important in the thinking behind the creation of the CTR Program and in its subsequent implementation as policy. The academics involved in the Harvard *Soviet Nuclear Fission* study and the broad Cooperative Security project provided the intellectual framework, including detailed policy proposals, for the CTR Program. Equally, the roles of Senators Nunn and Lugar were similarly important since not only did both senators consistently engage in the initiative, but they also presented the epistemic community's proposal to the U.S. Senate.

All members of the epistemic community believed that the three new nuclear republics required technical and financial assistance from the U.S. in order to

denuclearise. They were able to effectively frame the issue of non-proliferation as a security interest not only because they were respected within their own disciplines, but also because they had access to the major actors in the policy coordination and policymaking process (i.e., Nunn and Lugar), and as a result, were able to influence U.S. decision makers to implement the CTR Program as policy.

Once this programme was enacted in U.S. law at the end of 1991, umbrella agreements implementing CTR Program assistance were signed between the U.S. and each of the new nuclear republics (including Russia). It was clear that between 1992 and 1996, the CTR Program was an integral part in assisting the denuclearisation of Belarus, Kazakhstan, and Ukraine since it led to their ratification of the START I Treaty, the Lisbon Protocol, the Trilateral Agreement (Ukraine only), the NPT, and the removal of all Soviet nuclear warheads from their respective territories. These outcomes were all made possible under the auspices of the CTR Program.

Reflecting on the successes of the Nunn-Lugar CTR Program, in speaking to his colleagues in the U.S. Senate in December 2009, Senator Lugar noted that as of December 2009, the CTR Program had dismantled or eliminated 7,514 nuclear warheads, 768 ICBMS, 498 ICBM sites, 155 bombers, 651 submarine-launched ballistic missiles, 32 nuclear submarines, and 960 metric tons of chemical weapons (2009: 2).[192] He concluded by stating,

> I have never considered the Nunn-Lugar Act to be merely a program, or a funding source, or a set of agreements. Rather, it is an engine of non-proliferation cooperation and expertise that can be applied around the world. [...] It has demonstrated that the threat of weapons of mass destruction can lead to extraordinary outcomes based on mutual trust (2009: 3).

[192] See "The Nunn-Lugar Scorecard – Destroying Weapons and Materials of Mass Destruction Through Cooperation," available at http://lugar.senate.gov/nunnlugar/scorecard.html (Accessed 26 August 2010).

Chapter Eight

Conclusions

> "Without the convergence of interests and the diffusion of ideas between the specialist network and the leaderships, there would be no story at all."
>
> S. E. Mendelson (1993: 328)

This thesis has presented a novel investigation of the role of epistemic communities in nuclear non-proliferation policy formulation. It was explained in Chapters One and Two that the application of the epistemic community framework has been particularly prevalent in the realm of natural scientific and environmental policies (Haas 1989; 1990; 1992c, Peterson 1992, Hjorth 1994, Baark and Strahl 1995, Raustiala 1997, Ringius 1997, Betsill and Peilke 1998, Lidskog and Sundqvist 2002, Sauvé and Watts 2003, Dunlop 2010). Consequently, this thesis applied the framework of "a group of experts knowledgeable in niche-issue areas" to explore the process behind the creation of two significant and underexplored cases of cooperative nuclear non-proliferation agreements: ABACC and the CTR Program.[193] These agreements verified the non-nuclear weapon status of Argentina and Brazil and facilitated the denuclearisation of Belarus, Kazakhstan, and Ukraine, respectively. The analytical framework drew specific attention to how epistemic communities emerged and how they facilitated the creation and subsequent implementation by state decision makers of certain non-proliferation policies. The findings from this thesis illustrate that the role of epistemic communities can be considered an important factor in shaping these countries' eventual non-proliferation outcomes.

Chapters Two and Three provided this study's theoretical framework and research methodology, respectively. Chapters Four–Seven illustrated the emergence,

[193] It should be noted that the focus of the case studies analysis were on the creation, rather than on the maintenance, of these policies.

composition, and influence process of the epistemic communities in the chosen case studies. The latter chapters suggest that the actions and influence of epistemic communities are an important and additional factor to consider in understanding the process by which Argentina and Brazil remained non-nuclear weapon states and Belarus, Kazakhstan, and Ukraine became non-nuclear weapon states.

This concluding chapter is structured in four parts. First, it synthesises the theoretical and empirical findings from Chapters Four–Seven and considers the broader implications that these findings have for the added value of the epistemic community approach. Second, it evaluates the strengths and weaknesses of the epistemic community framework based on the empirical material in the thesis. Third, it explains the limitations of the study and proposes suggestions for further research. Finally, it highlights this thesis' overall contributions.

8.1 Key Theoretical and Empirical Findings

The application of the epistemic community framework in the creation of ABACC and the CTR Program illustrates that knowledgeable experts with access to decision makers can influence the creation of new non-proliferation policies. Therefore, such a framework deserves a central place in our understanding of how and why such policies are created. Theoretically, the findings from the thesis illustrate that the epistemic community framework can be applied to issue areas other than the environment and the natural sciences through the application of the influence mechanisms identified by Adler and Haas (1992). Empirically, the thesis provides a detailed explanation of the origins of ABACC and the CTR Program. It examined how and why these cooperative nuclear non-proliferation agreements emerged, from where and whom the ideas behind these policies originated, and how their subsequent implementation as policy by state decision makers was facilitated. In addition, it analysed how both non-proliferation agreements

were important in the eventual non-proliferation outcome of Argentina and Brazil, in one case, and Belarus, Kazakhstan, and Ukraine in the other case. The in-depth case studies did however reveal differences in the emergence, composition, and influence mechanisms of the two epistemic communities (presented in Table 8.1), which are considered in turn below.

Table 8.1
Comparison between the ABACC and CTR Program Epistemic Communities

Epistemic Community	ABACC	CTR Program
Emergence	• Born out of an incipient epistemic community developed during 1965–1980 • Creation of JWG and PCNA	• Uncertainty and complexity: Imminent collapse of USSR
Composition	• Argentine and Brazilian scientists • Argentine and Brazilian government officials (e.g., representatives from both foreign ministries)	• U.S. academics • U.S. and Soviet/ Russian research analysts • U.S. and Soviet/ Russian government officials
Influence Mechanisms		
• Knowledge	• Expertise in mutual safeguards/ inspections	• "The Cooperative Security Project", particularly the Harvard Study
• Access to decision makers	• Through representatives from the foreign ministries	• Through Hamburg
• Policy Innovation	• Throughout the 1980s: Development of a common nuclear policy	• Between August & December 1991: Potential "loose nukes" catastrophe
• Policy Diffusion	• Between 1985 & 1990: negotiations amongst JWG/PCNA; joint declarations; technical/ presidential mutual visits	• Between August & December 1991: regular consultative exchanges and mutual exchange of information
• Policy Selection	• Role of Argentina	• Role of Hamburg
• Policy Persistence	• Established in 1991, still in existence today	• Passed as law in 1991, still in existence today

Emergence

The theoretical framework of the epistemic community approach posits that when decision makers are faced with uncertainty and complexity (particularly regarding technical issues), they often demand particular sorts of scientific or technical information. In Chapter Two, it was explained that epistemic communities are one possible provider of such information because they consist of experts who are capable of producing and providing this information due to their possession of policy-relevant knowledge. Therefore, uncertainty and complexity provide an opportunity for an epistemic community to emerge (Haas 1992b).

In the cases explored in this thesis, the emergence of the epistemic communities differed. In the case of ABACC, the epistemic community behind the mutual safeguards and inspections regime was born out of an incipient epistemic community that began to develop during the 1965–1980 period. That is not to say that the epistemic communities were one and the same. Rather, the incipient epistemic community had started to develop in the 1965–1980 period based on Argentine and Brazilian common positions (i.e., their shared ideas) taken against the international nuclear non-proliferation regime, that by the 1980–1991 period, it had realigned in ways that made a process of cooperation, and by extension, ABACC, possible. This was facilitated once the epistemic community was given greater legitimacy when the 1985 Joint Declaration of Nuclear Policy established an ad-hoc Joint Working Group on nuclear issues (JWG), which by 1988 had been institutionalised as a Permanent Committee on Nuclear Affairs (PCNA). The JWG/PCNA – the institutionalised epistemic community – engaged in a mutual exchange of information and regular scientific and technical consultative exchanges surrounding the technical and complex nature of the mutual safeguards system – the *modus operandi* of ABACC.

However, that is not to say that moments of uncertainty and complexity were absent. Indeed, these two conditions were constantly present, but the evidence presented in the case study analysis indicates that they were not necessarily the facilitators of the emergence of an epistemic community. During the 1950s–1980s, Argentina and Brazil were uncertain about each other's unsafeguarded nuclear facilities especially since they had both indigenously developed some aspects of the nuclear fuel cycle and possessed nuclear facilities that were not subject to regional or international safeguards. Furthermore, both countries underwent a recurrent change in government as well as in government type (from military rule to democracy), adding further uncertainty and complexity.[194] However, it was argued that against the backdrop of uncertainty and change in the Argentine and Brazilian governments, the similarities and shared ideas in relation to their nuclear programmes and the non-proliferation regime facilitated the emergence of an epistemic community.

In the case of the CTR Program, the epistemic community behind the financial and technical assistance programme to the former Soviet nuclear-inherited states emerged during moments of uncertainty and complexity. In this case, the U.S. and the Soviet Union/Russia were uncertain about the command, control, and safety of 27,000 Soviet nuclear weapons after the dissolution of the Soviet Union in December 1991. The fall of the Soviet Union itself was mired in uncertainty and complexity involving such issues as food shortages, a lack of sufficient heating in the winter months, an impending "brain drain" crisis, the prospect of high unemployment, and the command and control of an overwhelming number of Soviet nuclear weapons. With its dissolution, 15 new independent states emerged, including Russia, Belarus, Kazakhstan, and Ukraine – the

[194] In Argentina, during the military government, there were three different leaders (General Roberto Viola, 1981; General Leopoldo Galtiere, 1981–1982; and General Reynaldo Bignone, 1982–1983). Then, with the return to democracy, Argentina saw two different presidents from 1983–1991 (President Raúl Alfonsín, 1983–1989 and President Carlos Menem, 1989–1995). Similarly, in Brazil, while there was only one military

inherited nuclear weapon states. In addition, the U.S. and Russia were equally uncertain about the nuclear intentions of the successor states, especially since Kazakhstan and Ukraine toyed with the idea of maintaining their inherited nuclear weapons.[195]

In this case, unlike that of ABACC, decision makers did not solicit expertise. This empirical finding challenges the theoretical proposition that when decision makers are faced with an issue with which they are not familiar and in which they lack specialist knowledge, they will seek advice from an epistemic community (Haas 1992a). Instead, in the CTR Program case, the epistemic community offered its suggestions and advice to decision makers on how to assist the newly independent states with the elimination or reduction of their inherited nuclear weapons. Even though decision makers in one case did solicit scientific and technical expertise, and decision makers in the other case did not solicit scientific and technical expertise, in both cases, members of the epistemic communities used their expertise in a niche issue area to help craft the implemented nuclear non-proliferation cooperative agreements of ABACC and the CTR Program.

Composition

In Chapter Two, it was explained that epistemic communities are described as "network of professionals with recognised expertise and competence in a particular domain and an authoritative claim to policy-relevant knowledge within that domain or issue area" (Haas 1992b: 3). While the term "professionals" has yet to be defined within the framework, much of the literature posits that epistemic communities consist of "experts" who come from a wide variety of disciplines and backgrounds. These include at least one group of scientific or technical experts with knowledge of particular issue areas and of at least one

leader (General João Figueiredo, 1979–1985), with the transition to democracy, Brazil saw two different presidents (President José Sarney, 1985–1990 and President Fernando Collor de Mello, 1990–1992).

[195] In Chapter Seven, it was explained that out of the three new independent nuclear states, Belarus consistently maintained its desire to be nuclear weapons free, mainly due to the 1984 Chernobyl nuclear reactor accident.

group of relevant government officials who are responsible for making policy within the issue area.

In line with the existing literature on epistemic communities, the network of professionals involved in creating the policies behind ABACC and the CTR Program comprised scientific/technical experts and government officials. These included representatives from national nuclear energy commissions, foreign policy analysts and academics, and officials charged with making nuclear policy. In the case of ABACC, the epistemic community was less inclusive of professionals from disciplines and professions outside the fields of science and government. In addition, they were difficult to identify, in terms of names and numbers. In this epistemic community, membership comprised both the scientific community (including representatives from CNEA and CNEN – the nuclear energy commissions in both states) and government officials (especially the representatives from the foreign ministries). Both clusters of groupings were equally important in the thinking behind the creation of ABACC and in its subsequent establishment. On the one hand, the scientists were responsible for outlining the ways in which the mutual safeguards inspection regime could be created, from a scientific and technical perspective. On the other hand, the government officials promoted the negotiations for bilateral nuclear inspections. Therefore, while government officials endorsed the idea behind ABACC and ultimately implemented it as policy, it was primarily the scientists who developed the entire concept and framework.

In the case of the CTR Program, the epistemic community was more inclusive of professionals from disciplines and professions outside the fields of science and government. In addition, they were easier to identify in terms of names and numbers (see Table 6.2). In this epistemic community, membership comprised a network of professionals with recognised expertise and competence in security and defence issues and who were all renowned experts in these issues, including nuclear proliferation. Their

network included U.S. and Soviet/Russian representatives from government bodies, academia, research institutes/think tanks, and a funding corporation. They provided both the intellectual and political impetus behind the CTR Program. They intellectualised the issue by arguing that a solution to curb the spread of further proliferation would be through an American-sponsored technical and financial assistance programme. The strong political influence came from U.S. Senators Nunn and Lugar, who presented the idea behind the programme to the U.S. Senate.

Influence Mechanisms

Adler and Haas argue that an epistemic community influences state decisions through the following four processes: policy innovation, policy diffusion, policy selection, and policy persistence (Adler and Haas 1992: 375–387). In the two cases explored in this thesis, these influence mechanisms were facilitated through members of epistemic communities' knowledge and access to decision makers. In the case of ABACC, devising and implementing a bi-national system of mutual inspections and verification of indigenous non-safeguarded nuclear installations between the two states required specific knowledge and expertise, coupled with the means with which to introduce the concept to the countries' decision makers. The scientists' contingent of the epistemic community used their knowledge and expertise to devise the mutual inspections system, while the government officials' contingent of the epistemic community (particularly representatives from the Argentine and Brazilian foreign ministries) provided them access to the countries' decision makers. Through their knowledge, expertise, and access to decision makers, the epistemic community influenced the creation and subsequent implementation of ABACC.

Similarly, in the CTR Program case, devising and implementing a U.S. financial and technical assistance programme for Russia and the three nuclear-inheriting states

required specific knowledge and expertise, coupled with the means with which to introduce the concept to U.S. decision makers. The Cooperative Security project, particularly the Harvard study, provided the "knowledge" of the issue at hand and lent empirical and analytical weight to the argument senior U.S. senators had been making earlier. All the experts within the epistemic community used their knowledge and expertise to devise the assistance programme, which, through the government officials' contingent of the epistemic community, was presented to the U.S. Congress. Through their knowledge, expertise, and access to decision makers, the epistemic community influenced the creation and subsequent implementation of the CTR Program.

Reflecting on Adler and Haas' influence mechanisms, the analysis of both cases suggests that there was greater involvement of the epistemic communities in some mechanisms over others. The epistemic community developing ABACC, for example, worked for a longer time than did the epistemic community developing the CTR Program in both policy innovation and policy diffusion. In the former case, there were four phases involved in policy innovation. The first phase took place throughout the 1950s–1970s, when both Argentina and Brazil shared a desire to acquire nuclear technological autonomy. This desire fostered an inherent and mutual shared disdain towards the international non-proliferation regime throughout the 1970s, which marked the second phase. The criticisms against the nuclear non-proliferation regime espoused by both Argentina and Brazil fostered a shared understanding on nuclear development, which, in part, led to the May 1980 agreement. Throughout the 1980s, a common nuclear policy was developed, marking the third phase. Having established a common nuclear policy, the two countries entered the final phase of establishing a mutual safeguards regime. Between the 1985 joint declaration and the November 1990 agreement calling for a bilateral inspection system, five years of intense "diffusion" activities – including

negotiations and the presidential and technical mutual visits to nuclear installations – took place amongst the representatives from the JWG/PCNA.

On the other hand, in the case of the CTR Program, policy innovation and policy diffusion took place over an intense five month period. Soon after the attempted August 1991 coup in the Soviet Union, U.S. senators, defence experts (from both academia and think tanks), and Soviet dignitaries/academics began thinking of solutions to avert the potential "loose nukes" catastrophe. Once all the experts converged, they agreed that the most likely way to prevent further nuclear weapons proliferation would be though a U.S. technical and financial assistance programme, which, by late December 1991, was passed by the U.S. Congress. The fact that the CTR Program took less time to develop than ABACC was probably because the dissolution of the Soviet Union was more of a pressing crisis that required immediate attention, given the thousands of nuclear weapons at stake.

Finally, it is important to reflect on the remaining two influence mechanisms: policy selection and policy persistence. In both cases, there was a key "connector" whose role was equally important in policy selection. In the ABACC case, the role of Argentina was especially important in terms of selecting the policy of mutual safeguards since it took and led the initiative on a cooperative and collaborative joint nuclear partnership – steps that led to the establishment of ABACC. In the CTR Program case, David Hamburg's role as the key "connector" was instrumental, as he introduced the non-governmental experts (Carter, Perry, and Steinbruner) to both Senators Nunn and Lugar, thereby granting the experts access to decision makers.

With regards to policy persistence, in both cases it came from the countries' leaderships. In the case of ABACC, policy persistence came from the two presidents who implemented the policy behind ABACC in July 1991, leading to its establishment in December 1991 and continued operation to this day. Soon after the creation of ABACC,

Argentina and Brazil integrated into the non-proliferation regime, signing safeguard agreements with the IAEA and signing both the Treaty of Tlatelolco and the NPT. In the case of the CTR Program, policy persistence came from the U.S. Congress passing the Soviet Nuclear Threat Reduction Act of 1991. This act was subsequently signed into law by President George H. W. Bush on December 12, 1991, and over the following years came to be known as the Cooperative Threat Reduction Program, which is still in existence today.

8.2 Evaluating the Analytical Framework

Having reviewed the key theoretical and empirical findings, it is important to present the strengths and weaknesses of the epistemic community framework. The analytical framework guided investigation of the role of epistemic communities in the creation of nuclear non-proliferation policies – a hitherto unexplored area.

Strengths

One of the main strengths of the epistemic community framework can be found in the way it helps to think about where the ideas behind implemented policies come from. While ABACC and the CTR Program have now been in existence for close to 20 years, an understanding of their creation is undoubtedly taken for granted. As such, the framework calls attention to the relevance of thought leaders and expert communities. This matters for the study of International Relations, particularly international security, an area teeming with many issues that need to be resolved.

As a framework, the epistemic community approach illustrates how decision makers were influenced to accept and implement certain non-proliferation policies. The framework suggested four mechanisms through which epistemic communities could exert their influence on decision makers: policy innovation, policy diffusion, policy selection, and policy persistence (Adler and Haas 1992: 375–387). In all stages,

knowledge, communication, and access to decision makers were equally important to the influencing process. All members of the epistemic community were knowledgeable in nuclear issues (technical and non-technical). Furthermore, regular consultative meetings enabled the diffusion of ideas and of policies. Finally, access to decision makers resulted in the epistemic community's proposals being heard and ultimately selected. In fact, in both cases, members of the epistemic community later went on to occupy senior government positions in their respective countries in order to implement the suggested policy. For example, in the case of ABACC, Professor José Goldemberg, one of Brazil's outspoken critics of the country's nuclear weapons programme and a key thinker behind the mutual safeguards inspection regime, served as President Collor's Minister for Science and Technology. Similarly, in the case of the CTR Program, Dr. Les Aspin, Dr. William Perry, and Dr. Ashton Carter – three of the main architects behind the idea of securing the loose nuclear materials from the former Soviet Union – went on to occupy senior government positions in the Clinton Administration.[196] One of their main responsibilities was managing the CTR Program.

Weaknesses

With regards to the framework's weaknesses, one limitation is its concept of "elitism". Described as a "model of elites by elites and for elites" (Jacobsen 1995: 303), the epistemic approach ignores the role of other important pressure groups, including civil society and the media. While the media was an important diffusion outlet in both cases in that members of both epistemic communities published op-eds and letters in widely read newspapers and journals, the role of civil society is largely ignored by the framework.

In addition, the framework does not help predict in which countries specific ideas will emerge. While it can infer which ideas are most likely to be influential and

[196] Aspin became Secretary of Defense (1993–1994), Perry became Deputy Secretary and later Secretary of

when – ideas that resonate closely with decision makers' interests and during times of technical uncertainty and complexity – the framework is not designed to aid in the prediction of which countries these ideas are likely to emerge from. Notwithstanding these weaknesses, the thesis posits that with its focus on the influence mechanisms, the framework provides scholars with a good starting point to carry out a systematic investigation of when, where, and how certain policies originate.

8.3 Avenues for Future Research

The analysis in this thesis indicated that epistemic communities contribute to a deeper understanding in explaining nuclear non-proliferation outcomes since it focuses on the process of the creation of non-proliferation policies. An interesting further line of enquiry would be to investigate the role of an epistemic community in other nuclear capable countries that opted for security guarantees (e.g., Japan, South Korea, Yugoslavia), signed the NPT (e.g., Sweden, Romania), subscribed to the non-proliferation norm (e.g., Switzerland, South Africa), or transitioned to democracy (e.g., Spain). Such an examination would assess the broader role of an epistemic community in non-proliferation decisions.

Another avenue for further research is to examine a case of proliferation in order to understand the overall argument regarding the relationship between epistemic communities and non-proliferation. How can we be sure that epistemic communities *only* influence non-proliferation policy as opposed to proliferation policy? It would be interesting to explore whether epistemic communities were indeed present in influencing state decision makers to pursue the bomb. Such a study would be in a position to address three very important policy questions. First, to what extent are epistemic communities necessary in order to curb nuclear weapons proliferation? Second, to what extent do

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Defense (1993–1994; 1994–1997, respectively), and Carter became Assistant Secretary of Defense for

epistemic communities play a role in the decisions of some countries to acquire a nuclear weapons capability and in the decisions of others not to do so? Third, to what extent are such communities influential in the decisions of countries to pursue nuclear weapons? The problem of proliferation is still with us 60 years after the inception of the atomic bomb. Currently, there is widespread speculation that a nuclear-armed Iran might prompt a nuclear cascade in the Middle East. Thus, a more sophisticated understanding of the reasons behind proliferation and non-proliferation – beyond proliferation begetting proliferation – will be useful well into the future.

8.4 Overall Thesis Contributions

This thesis makes a contribution in the theoretical, empirical, and policy realms surrounding the issue of nuclear non-proliferation. One of the original theoretical contributions this thesis makes is by illustrating how an epistemic community facilitates the creation and subsequent implementation as policy of cooperative nuclear non-proliferation agreements. In addition to the four influence mechanisms identified by Adler and Haas (1992), this study argues that without both knowledge and access to decision makers, it is unlikely that an epistemic community could have been as effective in influencing national decision makers to implement non-proliferation policy.

The findings from this research also provide an empirical contribution. To date, there has not been any academic research analysing the role of an epistemic community in the creation of ABACC and the CTR Program. By illustrating the role played by epistemic communities in the creation of these two cooperative nuclear non-proliferation agreements, the analysis presented in this thesis shed new light on the process which led to the eventual non-proliferation outcomes of Argentina, Brazil, Belarus, Kazakhstan, and Ukraine. As stated in Chapter One, the concept of extended deterrence (i.e., the

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International Security Policy (1993–1996).

provision of security guarantees), integration within the nuclear non-proliferation regime (notably the NPT), subscribing to the non-proliferation norm, and democratisation were not fully sufficient to explain their non-proliferation outcomes. As such, the empirical findings from this research complement the existing explanations for these countries' non-proliferation outcomes.

Finally, this analysis makes an important policy contribution. Research in this area of epistemic communities can contribute to understanding the many factors that influence non-proliferation outcomes and better inform policymakers on the range of tools that might be at their disposal to achieve non-proliferation objectives. Understanding the role of an epistemic community in the non-proliferation outcome leads to the possibility of creating more effective non-proliferation policies in the future. In addition, it hints at the need to sustain non-proliferation epistemic communities in all countries that can provide input to the global proliferation problem until it is solved.

APPENDIX I – Interview Questions

In the following tables, I highlight the leading questions and follow-up questions asked of all interviewees. The leading questions were broad on purpose so that it gave the respondent room to elaborate where he/she sees fit. The follow-up questions were included in case the respondent failed to cover these issues when answering the leading question.

ABACC:

Leading Questions	Follow-up Questions
1. How was the decision to not pursue a nuclear weapons option identified?	• When was it identified? • Why? • Who identified it? • Who were the key actors (details of people involved: scientists, government officials, academics, etc.)?
2. How often did Argentines meet with their Brazilian counterparts to discuss nuclear issues?	• Monthly? • Bi-monthly? • Who initiated the meetings? • Conference participation/workshops/ Track II meetings? • Were there more meetings amongst scientists and government officials, or amongst government officials and academics/analysts?
3. In which ways did the actors communicate?	• Domestic level? Who was involved? • Transnational level? Who was involved? • Follow-up phone calls after meetings? • Regular contact?

The CTR Program:

Leading Questions	Follow-up Questions
1. How was the goal of denuclearising Belarus, Kazakhstan, and Ukraine identified?	• When was it identified? • Who identified it? • Who were the key actors? • (If respondent mentions U.S. and Russia as the key actors, I will probe for details of the people involved)
2. How often did Americans meet with their Russian counterparts to discuss CTR?	• Monthly? • Bi-monthly? • Who initiated the meetings? • Conference participation/workshops/ Track II meetings? • Were there more meetings amongst scientists and government officials, or amongst government officials and academics/analysts?
3. In which ways did the actors communicate?	• Domestic level? Who was involved? • Transnational level? Who was involved? • Follow-up phone calls after meetings? • Regular contact?

APPENDIX II – Interview Collection

Interviews Relating to ABACC:

Interview A = Argentine diplomat; former Director of Nuclear and Security Affairs in the Argentine Foreign Service, face-to-face interview, The Hague, 8 December 2008.

Interview B = Brazilian diplomat in the Brazilian Ministry for External Relations, telephone interview, 5 May 2009.

Interview C = Brazilian diplomat in the Brazilian Foreign Service, telephone interview, 27 May 2009.

Interview D = Brazilian diplomat, face-to-face interview, London, 28 May 2009.

Interview E = Brazilian scientist; former Brazilian Minister of Science and Technology, email correspondence, 29 May 2009; 1 June 2009.

Interview F = Argentine diplomat, face-to-face interview, London, 19 August 2009.

Interview G = Brazilian scientist; former ABACC inspector and former JWG/PCNA member, face-to-face interview, Vienna, 2 September 2009.

Interview H = Argentine scientist and former Director of International Affairs at CNEA, face-to-face interview, Vienna, 2 September 2009.

Interview J = Argentine scientist from *Autoridad Regulatoria Nuclear* (Argentina's Nuclear Regulatory Authority); former JWG/PCNA member, telephone interview, 30 September 2009.

Interview K = Argentine scientist; former Head of International Affairs at CNEA, Email correspondence, 2 October 2009.

Interview L = Argentine diplomat in the Argentine Foreign Service, email correspondence, 9 September 2009.

Interview M = American academic, email correspondence, May–June 2009.

Interview N = Brazilian scientist, email correspondence, 12 August 2009.

Interview O = Argentine diplomat in the Argentine Foreign Service, email correspondence, 7 September 2009.

Interview P = Argentine diplomat; former Director of Nuclear Affairs in the Argentine Foreign Service, email correspondence, 23 September 2009.

Interview Q = Safeguards Research Analyst at the IAEA, Email correspondence, November–December 2008, and face-to-face interview, San Diego, 4 August 2009.

Interview R = American academic, face-to-face interview, San Diego, 28 July 2009.

Interview S = Argentine diplomat, telephone interview, 11 September 2009.

Interviews Relating to The CTR Program:

Interview I = U.S. negotiator for the Nunn-Lugar/CTR Program, email correspondence, April–May 2009.

Interview II = Senior U.S. official; former U.S. Assistant Secretary of Defense, telephone interview, 17 July 2008.

Interview III = U.S. negotiator for the Nunn-Lugar/CTR Program, telephone interview, 14 August 2008.

Interview IV = Former U.S. Department of State official and former Director of the U.S. National Academy of Sciences Committee on International Security and Arms Control, face-to-face interview, Washington, D.C., 3 April 2009.

Interview V = U.S. scientist/former director of a U.S. national laboratory, telephone interview, 2 September 2008.

Interview VI = Former Colonel in U.S. Air Force, telephone interview, 24 July 2008.

Interview VII = Senior U.S. official (National Security Council); former staff assistant at Harvard's Belfer Center International Security Program, face-to-face interview, Washington, D.C., 7 August 2008; and email correspondence, 14 April 2009.

Interview VIII = Former project manager for Swedish-Russian cooperation projects in destroying FSU's chemical weapons stockpiles, email correspondence, June 17 2009.

Interview IX = Former U.S. Department of Energy Senior Advisor, telephone interview, 15 August 2008.

Interview X = Russian scientist from Moscow Institute of Physics and Technology, email correspondence, June 14 2009.

Interview XI = Former senior advisor to Senator Richard G. Lugar, telephone interview, 7 July 2008.

Interview XII = Former director of a renowned U.S. public policy research institution, telephone interview, 2 September 2008.

Interview XIII = Russian academic, email correspondence, 10 June 2009.

Interview XIV = U.S. academic, telephone interview, 14 August 2008.

Interview XV = Former representative at the Russian Ministry of Foreign Affairs, Department of Arms Control and Disarmament, email correspondence, 30 April – 1 May 2009.

Interview XVI = U.S. academic, telephone interview, 12 August 2008.

Interview XVII = Former employee of a U.S. defence contractor who was involved in managing the Nunn-Lugar CTR Program with the U.S. Department of Defense, telephone interview, 15 August 2008.

Interview XVIII = Former high-level official in Soviet/Russian diplomatic service, email correspondence, 27–28 May 2009.

Interview XVIX = Former Swedish diplomat and politician, face-to-face interview, Stockholm, 10 July 2009.

Interview XX = U.S. expert in arms control and non-proliferation issues and senior associate at a renowned U.S. public policy research institution, telephone interview, 31 July 2008.

Interview XXI = Senior U.S. official, face-to-face interview, Washington D.C., 15 July 2008.

Interview XXII = U.S. expert in arms control and non-proliferation issues and senior associate at a renowned U.S. public policy research institution, face-to-face interview, Washington D.C., 15 July 2008.

Interview XXIII = U.S. academic and former government official, telephone interview, 9 July 2008.

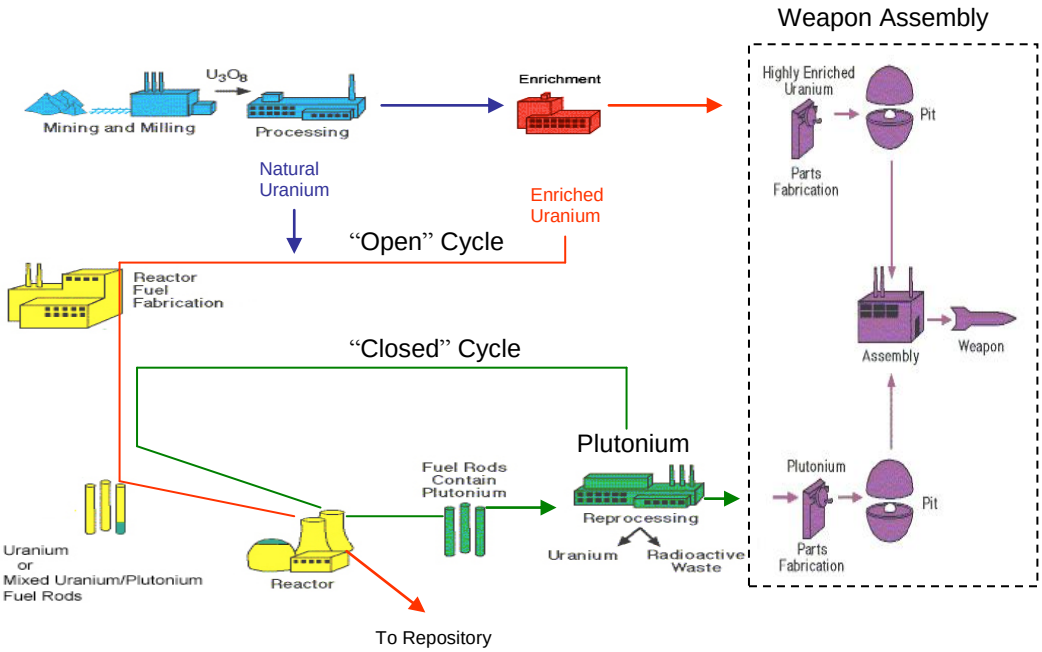
Interview XXIV = U.S. expert in arms control and non-proliferation issues and director at a renowned U.S. public policy research institution, face-to-face interview, Washington, D.C., 8 July 2008.

Interview XXV = U.S. expert in arms control and non-proliferation issues and senior associate at a renowned U.S. public policy research institution, face-to-face interview, Washington, D.C., 30 June 2008.

Interview XXVI = U.S. expert in arms control and non-proliferation issues and former official and consultant to U.S. government, face-to-face interview, Washington, D.C., 30 June 2008.

Interview XXVII = U.S. academic, telephone interview, 14 July 2008.

APPENDIX III: Nuclear Fuel Cycle[197]



[197] This diagram is courtesy of Lawrence Livermore National Laboratory that was presented at a "Public Policy Nuclear Threats" workshop convened at the University of San Diego, California (24 July – 2 August 2009).

APPENDIX IV: **Governments of Argentina and Brazil (1946–1995)**

Argentina:

Government Type	Dates in Power	Leader
First Peronist Term: 1946–1955		
Civilian	1946–1955	President Juan Domingo Perón
***Revolución Libertadora*: 1955–1958**		
Military	20 Sept. – 23 Sept. 1955	General José Domingo Molina Gómez
Military	23 Sept. – 13 Nov. 1955	General Eduardo Lonardi
Military	1955–1958	General Pedro Eugenio Aramburu
Argentine Republic: 1958–1966		
Civilian	1958–1962	President Arturo Frondizi
Civilian	1962–1963	President José María Guido
Civilian	1963–1966	President Arturo Umberto Illia
***Revolución Argentina*: 1966–1973**		
Military	1966–1970	General Juan Carlos Onganía
Military	1970–1971	General Roberto M. Levingston
Military	1971–1973	General Alejandro A. Lanusse
Second Peronist Term: 1973–1976		
Civilian	25 May – 13 July 1973	President Héctor José Cámpora
Civilian	13 July – 12 Oct. 1973	President Raúl Alberto Lastiri
Civilian	1973–1974	President Juan Domingo Perón
Civilian	1974–1976	President Isabel Perón
Proceso de Reorganización Nacional: 1976–1983		
Military	1976–1981	General Jorge Rafael Videla
Military	1981	General Roberto Viola
Military	1981–1982	General Leopoldo Galtieri
Military	1982–1983	General Reynaldo Bignone
Return to Democracy: 1983–Present		
Civilian	1983–1989	President Raúl Alfonsín (Dr.)
Civilian	1989–1995	President Carlos Menem

Brazil:

Government Type	Dates in Power	Leader
The Republic of 1946		
Civilian	1946–1951	President Gaspar Dutra
Civilian	1951–1954	President Getúlio Vargas
Civilian	1954–1955	President Café Filho
Civilian	1955	President Carlos Luz
Civilian	1955–1956	President Nereu Ramos
Civilian	1956–1961	President Juscelino Kubitshcek
Civilian	31 Jan. – 25 Aug. 1961	President Jânio Quadros
Civilian	25 Aug. – 7 Sept. 1961	President Ranieri Mazzilli
Civilian	1961–1964	President João Goulart
The Military Dictatorship: 1964–1985		
Civilian	2 – 15 April 1964	President Ranieri Mazzilli
Military	1964–1967	General Castelo Branco
Military	1967–1969	General Costa e Silva
Military	1969	Military junta: General Augusto Rademaker General Aurélio de Lira General Márcio Melo
Military	1969–1974	General Emilio Medici
Military	1974–1979	General Ernesto Geisel
Military	1979–1985	General João Figueiredo
The New Republic: 1985–Present		
Civilian	1985–1990	President José Sarney
Civilian	1990–1992	President Fernando Collor de Mello

APPENDIX V: Argentina and Brazil Nuclear Cooperation Agreements/ Declarations

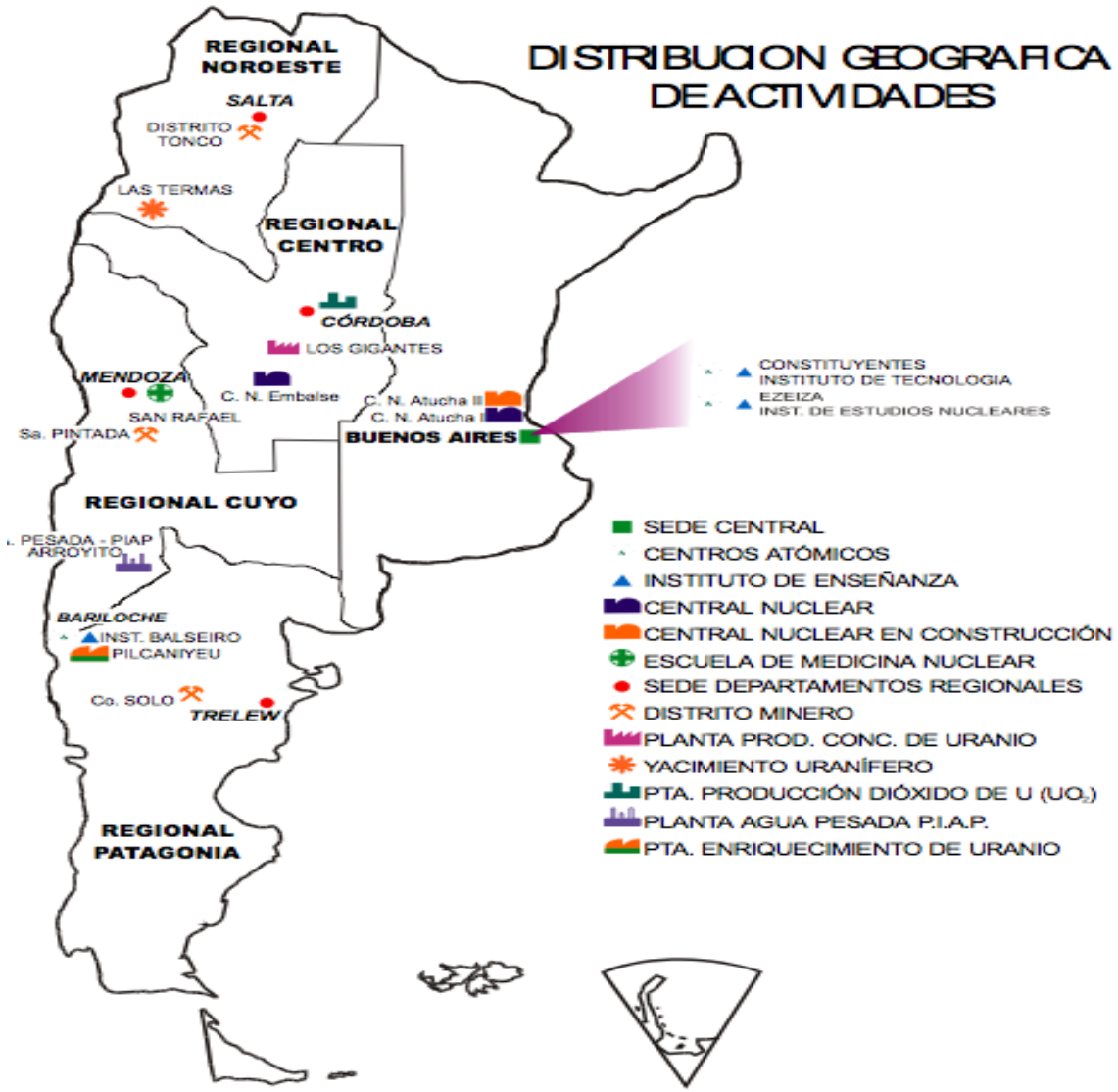
Date	Name of Agreement
17 May 1980, Buenos Aires	Agreement on Cooperation for the Development and Application of the Peaceful Uses of Nuclear Energy
29 November 1985, Foz de Iguaçu	Declaration of Iguaçu (highlights the significance of the inauguration of the "International Bridge" connecting the Brazilian city of Porto Meira with the Argentine city of Puerto Iguaçu as a physical and symbolic link representing union between both nations)
30 November 1985, Foz de Iguaçu	Joint Declaration on Nuclear Policy (establishes a Joint Working Group on nuclear issues under both countries' foreign ministries)
10 December 1986, Brasilia	Joint Declaration on Nuclear Policy (reiterates the commitment to use nuclear energy for peaceful purposes and identify nuclear cooperation as an important means of building mutual confidence)
10 December 1986, Brasilia	Protocol on Nuclear Cooperation (n. 17) (defines the areas of joint cooperation and development in nuclear issues, Carasales 1992: 76)[198]
17 July 1987, Viedma	Joint Declaration on Nuclear Policy, Viedma (states the mutual intention to (i) end any secrecy surrounding their nuclear programme and (ii) continue to deepen their cooperation)
8 April 1988, Iperó	Joint Declaration on Nuclear Policy, Iperó (transforms the Joint Working Group into the Permanent Committee on Nuclear Affairs under the direction of both countries' foreign ministries and the heads of CNEA and CNEN)
29 November 1988, Ezeiza	Joint Declaration on Nuclear Policy, Ezeiza (reaffirms their commitment to pursuing dialogue and further cooperation on nuclear issues)

[198] This is a purely technical agreement and it promotes nuclear sector integration between the two states.

6 July 1990, Buenos Aires	Joint Statement, Buenos Aires (endorses the nuclear cooperation accords reached by their predecessors, and reiterates their countries' commitment to the peaceful uses of nuclear energy)
28 November 1990, Foz de Iguaçu	Declaration on Common Nuclear Policy, Foz de Iguaçu (creates the Common System for Accounting and Control of Nuclear Materials, begins reciprocal inspections, starts negotiations with IAEA for joint safeguards agreement, works towards the full entry into force of the Treaty of Tlatelolco)
18 July 1991, Guadalajara	Agreement for the Exclusively Peaceful Use of Nuclear Energy (Guadalajara Accord) (establishes ABACC to implement the bilateral inspection system SCCC. In addition, both parties agree to abstain from carrying out the testing, use, manufacture, production or acquisition by any means of any nuclear explosive device)
13 December 1991, Vienna	Quadripartite Agreement (establishes the technical equivalent of full-scope IAEA safeguards on all Argentinean and Brazilian nuclear sites)

APPENDIX VI: Argentina's Nuclear Infrastructure[199]

Argentina has two nuclear power plants in operation, and one nuclear power plant under construction: Atucha I (Lima, Buenos Aires) – supplied by the West German company Siemens – a natural-uranium heavy-water power reactor that came online in 1974; Embalse (Rio Tercero, Cordoba) – supplied by Atomic Energy Canadian Ltd. - a heavy-water power reactor that came online in 1983; and Atucha II (Lima, Buenos Aires), a projected heavy-water power reactor whose construction started in 1980 under a contract with Siemens, but to date remains an incomplete project in view of start-up dates being postponed and spiralling estimated costs. Work on Atucha II ceased in 1994, but was restarted in August 2006, and it is scheduled to come online by 2010.[200]



[199] Diagram taken from IAEA Country Nuclear Power Profiles, 2002: 26

[200] This is according to the Atucha 2 website: Atucha II – Nucleoeléctrica Argentina S.A. website: http://www.atucha2.com/images (Accessed 30 December 2009).

APPENDIX VII: Brazil's Nuclear Infrastructure[201]

Brazil has one nuclear power plant in operation, one nuclear power plant under construction, and one nuclear power plant that was suspended: Angra I (Itaorna, Rio de Janeiro) – purchased from the U.S. company Westinghouse in 1971 – a light-water nuclear power plant which commenced commercial operation in 1984; Angra II (Itaorna, Rio de Janeiro) – is a pressurised water reactor currently under construction[202], but was initially meant to be supplied by West Germany as part of Brazil's June 1975 "nuclear deal of the century"[203]; and construction of Angra III (Itaorna, Rio de Janeiro), a pressurised water reactor, has been indefinitely suspended.

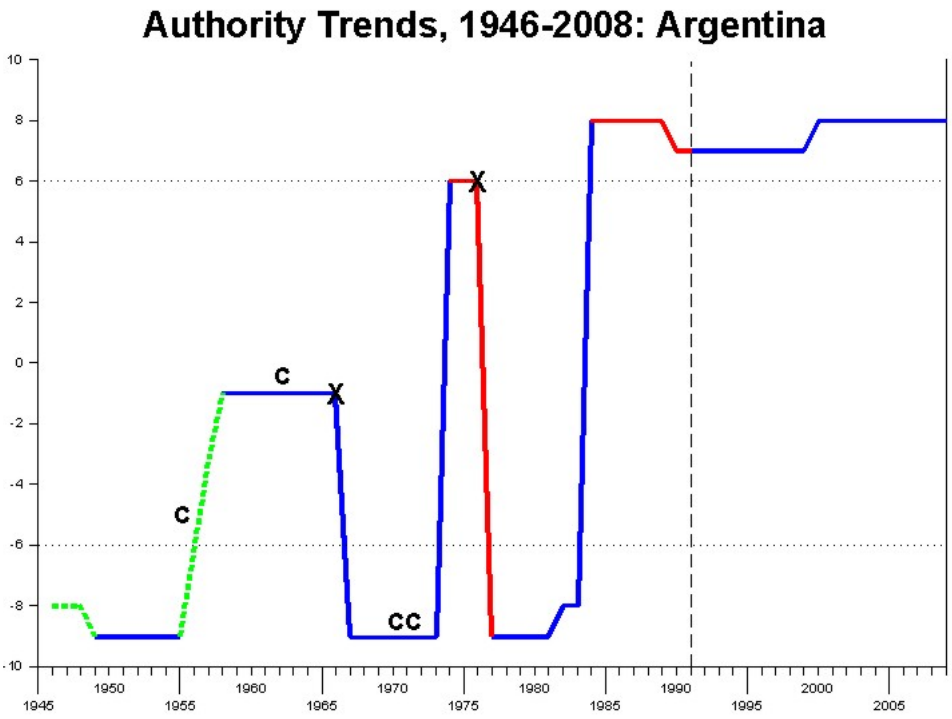
[201] Diagram taken from IAEA Country Nuclear Power Profiles, 2002: 118

[202] Delays and spiralling costs have made this reactor one of the world's most expensive nuclear power stations (Doyle 1997: 136).

[203] This was a multi-billion dollar agreement whereby Brazil agreed to purchase two 1300 MWe light-water reactors, with an option for six more units. As part of the arrangement, West Germany agreed to supply Brazil with a complete nuclear package of fuel fabrication, reprocessing, and a "nozzle" type enrichment facility. This represented the first sale of the complete nuclear fuel cycle, and one of the largest transfers of nuclear technology to a developing nation (Redick 1995: 7).

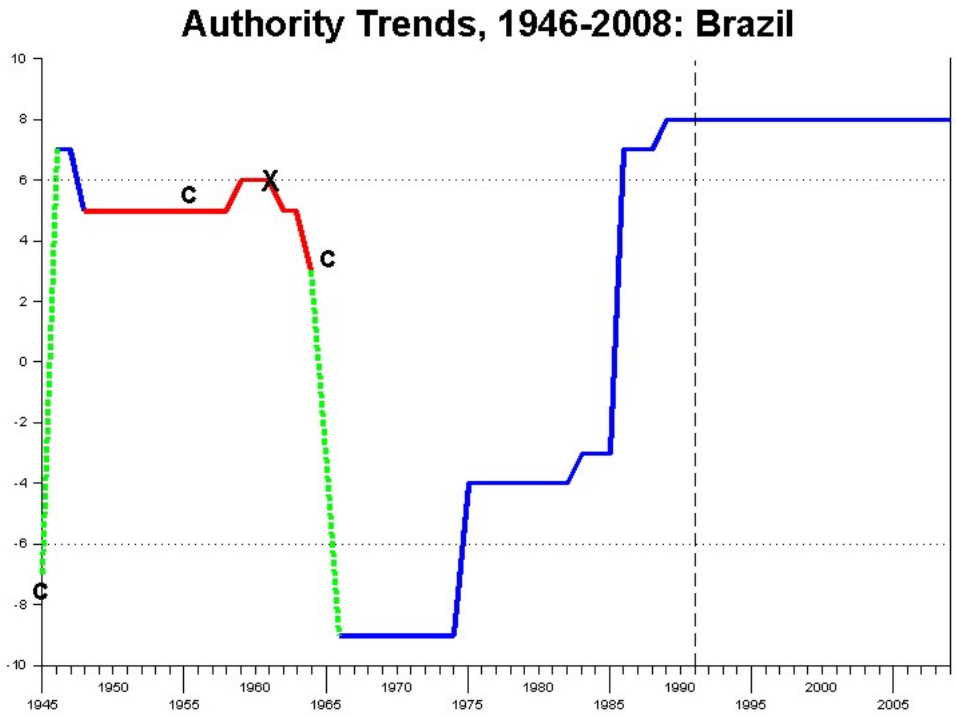
APPENDIX VIII: Political Regime Characteristics and Transitions, 1946–2008

Figure 1: Argentina – Authority Trends: 1946–2008[204]



[204] Please note that these diagrams have been from "The Polity IV Project: Political Regime Characteristics and Transitions, 1800–2008", a respected online resource that charts the authority characteristics of states in the world. Details of the government type and the dates of when they were in power are elucidated in Appendix IV.

Figure 2: Brazil – Authority Trends: 1946–2008[205]



LEGEND EXPLANTORY NOTES:

Democracy: +6 or above
Autocracy: -6 or below
Vertical line: end of the Cold War – 1991
Coup d'état (defined as a military or military-backed forcible ouster of an established executive with little or no change in regime authority): Bold Black "C"
Autocratic Backsliding (defined as a five-point or greater change towards more autocratic authority that forcibly replaces an established regime): Bold Black "X"
Green dashed line: "Transition"
Solid blue line: "Democracy"
Solid red line: "Factionalism"

[205] Please note that these diagrams have been from "The Polity IV Project: Political Regime Characteristics and Transitions, 1800–2008", a respected online resource that charts the authority characteristics of states in the world. Details of the government type and the dates of when they were in power are elucidated in Appendix IV.

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29 November 1985, Declaration of Iguaçu: http://www.abacc.org/engl/agreements_statements/agreements_statements_documents.asp?acordodeclaracao_id=3.

30 November 1985, Foz de Iguaçu Joint Declaration on Nuclear Policy: http://www.abacc.org/engl/agreements_statements/agreements_statements_documents.asp?acordodeclaracao_id=27.

10 December 1986, Brasilia Joint Declaration on Nuclear Policy: http://www.abacc.org/engl/agreements_statements/agreements_statements_documents.asp?acordodeclaracao_id=6.

17 July 1987, Viedma Joint Declaration on Nuclear Policy: http://www.abacc.org/engl/agreements_statements/agreements_statements_documents.asp?acordodeclaracao_id=8.

8 April 1988, Iperó Joint Declaration on Nuclear Policy: http://www.abacc.org/engl/agreements_statements/agreements_statements_documents.asp?acordodeclaracao_id=9.

29 November 1988, Ezeiza Joint Declaration on Nuclear Policy: http://www.abacc.org/engl/agreements_statements/agreements_statements_documents.asp?acordodeclaracao_id=26.

6 July 1990, Buenos Aires Joint Statement: http://www.abacc.org/engl/agreements_statements/agreements_statements_documents.asp?acordodeclaracao_id=11.

28 November 1990, Foz de Iguaçu Declaration on Common Nuclear Policy: http://www.abacc.org/engl/agreements_statements/agreements_statements_documents.asp?acordodeclaracao_id=12.

18 July 1991, Guadalajara Accord (Agreement for the Exclusively Peaceful Use of Nuclear Energy): http://www.abacc.org/engl/agreements_statements/agreements_statements_documents.asp?acordodeclaracao_id=4.

13 December 1991, Quadripartite Agreement, Vienna: http://www.abacc.org/engl/agreements_statements/agreements_statements_documents.asp?acordodeclaracao_id=14.

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