CHAPTER 1: INTRODUCTORY ORIENTATION

1.1 General Introduction

More than fifty years ago the atomic devastation of Hiroshima and Nagasaki had an immense global impact, illustrating a manmade destruction power unequalled in human history. Although, a long period of abstention from the use of nuclear weapons followed, and the public awareness of the nuclear devices' power of mass destruction has decreased, the security implications of these weapons remain immense.[1] These detonations at Hiroshima on 6 August 1945 and at Nagasaki three days later resulted in 117 000 immediate deaths and many thousands over the following decades.[2] During the Cold War the number of nuclear devices proliferated substantially. In 1946 the United States (US) had the world's entire stock of nine nuclear weapons, forty years later it was estimated that there were more than 50 000, mainly in the possession of the US and the Union of Soviet Socialist Republics (USSR).[3] The number of weapons has decreased since the end of the Cold War, more recent estimates of the number of nuclear weapons put the total at approximately 30 000 weapons in eight states.[4] Since 1991, the US and Russia, which control more than 95 percent of the world's nuclear weapons, have defused some 7 000 nuclear warheads, decommissioned 1 400 ballistic missiles, destroyed 180 tons of weapons-grade uranium and plutonium, and re-employed 50 000 weapons scientists in peaceful work.[5] Despite this and the fact that the global nuclear stockpile remains limited to eight states, nuclear weapons continue to present a significant potential threat to global security.

Nuclear weapons have never been used in conflict again, but continue to function as a means of deterrence between the nuclear weapon powers.[6] Despite deploying tens of thousands of these weapons, the disintegration of the USSR raised new questions about the value of nuclear arms for strategic security.[7] Since the end of the Cold War the applicability of the role as a deterrent has been questioned but no substantial changes to this role of nuclear weapons have been made by the nuclear powers. The US has started the process of addressing the possible development of a new conceptualisation of the strategic role of nuclear weapons.[8] Although this process of re-evaluating the strategic role of nuclear weapons would be inevitable, it will take some time to show any practical results. In the meantime because human fallibility is what it is, it remains uncertain whether human beings and nuclear weapons can co-exist indefinitely. It is argued by some that nuclear weapons will eventually

destroy the human race and civilisation.[9] This risk is highlighted for example by the protracted and continuing tensions between India and Pakistan over the Kashmir-Jammu issue. Both states developed a nuclear capability with the aim to deter the other but many triggers could potentially push both governments to widen the scope of the conflict between them to a nuclear level.[10] Another current threat is related to non-state actors obtaining a nuclear weapon capacity. While this remains a low probability threat, the consequence of such an occurrence would have significant negative consequences for global security. The role of nuclear weapons has changed since the end of the Cold War with the end of the nuclear stand-off between Russia and the US. While the threat of a full-scale nuclear exchange between the Cold War opponents have decreased, this is not the case with continuing threats posed by regional rivals and even possible non-state actors obtaining such a capacity.

It was the fear of the destruction of human civilisation which resulted in the development of non-security disincentives against nuclear weapons of which the global non-proliferation norm remains the cornerstone.[11] The aim of this norm is stopping the further proliferation of nuclear weapons.[12] In terms of the compromise negotiated, the five official nuclear weapon possessors (US, Russia - as successor state to USSR, United Kingdom, France and the People's Republic of China), are allowed to keep their nuclear weapon capability while no states obtaining the capability after 1970 will be recognized as official nuclear weapon states by the international community.[13] Despite the inherent discriminatory nature of this treaty, it was accepted by nearly all sovereign states and was extended indefinitely in 1995 by its signatories.

This compromise, however, could not prevent four additional states from obtaining nuclear weapon capabilities, namely Israel, India, Pakistan and South Africa. It is also possible that the Democratic Peoples' Republic of Korea (DPRK) joined this group of states. The resistance by these states (except South Africa) to accept the non-proliferation norm and other bilateral and multilateral non-security disincentives are attributed by many scholars to continuing Cold War- like regional security related concerns.[14] Although the non-proliferation norm was strengthened by the nuclear non-proliferation successes especially during the early 1990s, the difficulty of ensuring compliance by the DPRK showed that it is also not the cure of all nuclear proliferation threats.

Just before the end of the Cold War the first official dismantling of a nuclear weapon capability occurred, when South Africa decided to rollback its nuclear weapon capability. Nuclear rollback occurs when a state voluntarily achieves one or more of the following: eliminates its nuclear weapons, or accepts a multilateral or bilateral control regime to prevent it from restarting a nuclear weapon programme.[15] The elimination of South Africa's weapons has generally been regarded as of global significance since it was the first time a state possessing nuclear weapons both completely dismantled them and publicly acknowledged their possession. These actions from a developing state, the main focus of post-Cold War concerns regarding nuclear proliferation, make the South African case significant. The influences that led to the decisions to develop these weapons as well as to dismantle them are important to analyse for the effective implementation of the global non-proliferation regime in the future. Although the South African decision came at the end of the Cold War, it was before significant progress was made in consolidating and strengthening the non-proliferation norm, which only occurred in the early 1990s. South Africa's decision to terminate and dismantle its nuclear capability had a practical spinoff in the destruction of nuclear devices, but also symbolic value in illustrating that the total elimination of a nuclear capability by a state is possible. Since then South Africa has become an active supporter of global nuclear non-proliferation.

The proliferation of nuclear weapons is a dynamic and complex problem. For future measures to restrict nuclear proliferation effectively, the reconciliation of sometimes divergent interests throughout the world needs to be achieved. In this context the South African experience is considered to contain useful examples of dealing with nuclear non-proliferation.

1.2 Identification and Demarcation of the Research Problem

1.2.1 Background to the Research Problem

The South African experience took place within a context in which the macro international political situation, the general incentives and disincentives for nuclear weapons, the developing non-proliferation norm all influenced nuclear proliferation and non-proliferation in South Africa. These factors make it possible to understand the research problem and objectives of this study. Before the research problem

is formulated it is thus necessary to provide the broader context within which the South African nuclear proliferation experience could be explained. The numerous risks posed by nuclear weapons have increased with each new state joining the nuclear weapon club. The impact of nuclear weapons on global stability in this regard includes giving rise to a domino effect (encouraging other states to go nuclear), raising the chance that local wars may become nuclear, increasing the risk of accidental or unauthorized use and thus increasing over time the probability of nuclear war. Furthermore the existing moratorium on the use of nuclear weapons could be broken, provoking or justifying a continued arms race among nuclear weapon states, complicating future arms limitation negotiations and leading to the eventual acquisition of nuclear weapons by radical countries.[16] While multi-lateral initiatives were from the beginning of the nuclear age endeavouring to stem large scale global nuclear armament, these initiatives did not for example, stop South Africa on embarking on a nuclear weapon programme.

In order to study the impact of multi-lateral non-security incentives, especially the developing non-proliferation norm on the proliferation of nuclear weapons in South Africa, it is useful to take cognisance of the international development of phenomena relevant to nuclear proliferation and non-proliferation. For this introductory part two paradigms of international relations, namely the realist and rationalist traditions, as identified by Martin Wight, are useful for understanding the macro global environment.[17] These two traditions are related to two interrelated political conditions which comprise the major subject matter of international relations. Although these paradigms only present a broad view of political actions, it nevertheless provide useful instruments to evaluate both nuclear proliferation and non-proliferation phenomena.

The first condition is that, no politically superior power exists and a multiplicity of independent sovereign states acknowledges and ultimately uses warfare to regulate relationships. This is the basis of the realist world view regarding international relations.[18] Since the international system is anarchic in the absence of higher authority, states are forced to seek sufficient power to ensure their survival.[19] Seeking more power is, however, also much more than only a survival instrument, seeing that it promises a dramatic shift in the balance of power.[20] Power struggles can be reduced to three basic forms according to Hans Morgenthau: the retention of power, the increasing of power and the demonstration of power.[21] Realists define power as a multifaceted aggregate of physical factors such as natural resources, geography,

population, industrial capacity, as well as less tangible factors such as leadership, forms of government, and national power. At the national state level nuclear weapons can, according to these views, contribute to national power or perceptions of power. The destructive potential of these weapons is unequalled and their military capability, as well as psychological influences resulting, such as prestige and fear, may thus inspire states to endeavour to equip themselves with these weapons.[22]

The view that nuclear weapons would enhance a state's security, is strengthened by the diffusion of technology on a global scale, making the development of nuclear weapons feasible for many states, including developing states. Nuclear weapon proliferation, however, is not driven by technology, despite the fact that technology remains a vital part of obtaining such a capability. The international political structure, especially its anarchical nature, remains a determining factor for the realist, predicting that the nuclear weapons would continue to spread to more and more states.[23] Realist based viewpoints have been reflected in South Africa's threat perceptions since especially the late 1970s.[24] The possible manifestation of realist viewpoints in nuclear weapon decisions in South Africa needs to be investigated.

The end of the Cold War had a distinctly positive effect on global security by reducing the threat posed by the potential nuclear conflict between the US and Russia. This provided an opportunity for non-security incentives to strengthen global efforts to prevent the further spread of nuclear weapons. Despite this initial optimism and hope regarding the positive security spinoffs gained from the demise of the bipolar international order, realist scholars warned that the development of nuclear weapons would continue, while it would also spread to countries that previously did not have the ability to manufacture such devices.[25] The argument that such states will continue to want to develop or obtain nuclear weapons, when they face or appear to face a significant military threat to their security (that cannot be met through alternative means) has remained a dominant paradigm among some realist scholars.[26]

The dominance of security factors in traditional realist thought has, however, recently been challenged by some realist orientated scholars.[27] This could possibly reflect a shift to more rationalist perceptions regarding the issue of nuclear proliferation, reflecting international efforts to strengthen the non-proliferation regime. Although security factors will remain important in any evaluation of incentives to

obtain nuclear weapons, such an evaluation could become inadequate, if other factors that could also be determinants supporting proliferation relevant policy decisions are ignored.[28]

The second condition is that diplomacy and commerce form the basis of international and institutionalized interaction between sovereign states. Rationalists thus tend to emphasize and concentrate on this element of international interaction.[29] They believe that man, although "manifestly a sinful and bloodthirsty creature", is also rational, using reason to explain and understand the world.[30] The rationalist perspective is associated with an element of reason, contained in the concept of natural law. According to Wight: "The belief in natural law is a belief in a cosmic, moral constitution, appropriate to all created things including mankind, a system of eternal and immutable principles radiating from a source that transcends earthly power (either God or nature)."[31] Rationalists generally do not view the spread of nuclear weapons as inevitable. The rationalist will thus also focus on international measures to limit, stop and even rollback proliferation. Again the question if rationalist's viewpoints could be identified within the South African nuclear weapon decision making, especially regarding the rollback decision, needs to be investigated.

A multitude of factors can be identified as influencing a government's decision making to obtain a nuclear weapon capability or to abandon such a capability. A useful way to structure such factors is to analyse the incentives and disincentives which influences government's decision making on a nuclear weapon capability. William Potter identified four broad clusters of nuclear weapon incentives and disincentives. These clusters were formed by grouping nuclear weapon incentives and disincentives according to the relative importance they assign to internal or external considerations and military or political-economical objectives. These clusters could be labelled as factors of international security and politics as well as domestic security and politics.[32] Augmenting these views, Sagan focuses specifically on the role of normative factors in nuclear weapon decision making.[33] Besides the security model, corresponding with the realist and neorealist perception of a state's maximizing its military capability in an anarchic system with the aim of securing its existence, Sagan also refers to a domestic political model and a normative model. The domestic model refers to the "parochial bureaucratic or political interests" of actors relevant to nuclear weapon decision making. In contrast to realist views, which generally regard bureaucratic pressure for proliferation as subordinate to the crucial national security issues a state faces,

this model regards the mainly scientific-military- industrial complex as powerful enough to play a decisive role in nuclear weapon decision making.

The rationalist scholars usually highlight the role of norms influencing the acquisition of nuclear weapons. Nuclear weapon decisions are seen as "serving important symbolic functions - both shaping and reflecting a state's identity".[34] Multilateral diplomacy could pave the way for developing new norms against the acquisition of nuclear weapons, as well as for establishing standards of behaviour for states possessing nuclear weapons. While it remains true that some countries may assume a public non-proliferation stance and even become members of treaties to conceal nuclear weapon ambitions, the vast majority of such commitments are not violated or repudiated by member states of non-proliferation regimes.[35] Norms influencing decisions leading to the total elimination of nuclear weapons, however, remain idealistic. Coupled with general domestic political initiatives, the role of global non-proliferation norms as a possible serious obstacle to nuclear proliferation needs to be further examined. It is by no means certain that the levels of international cooperation needed to contain proliferation can be achieved. When empirical situations regarding current initiatives to strengthen international measures such as nuclear safeguards, universal membership of the Nuclear Non-Proliferation Treaty (NPT), and international export control regimes are taken into account, they seem to indicate that non-proliferation efforts are at least gaining meaningful international acceptance as well as commitment from the majority of international states. This could be an important prerequisite if proliferators are to be increasingly isolated, with no large-scale efforts from new countries joining the nuclear weapon fold. Challenges to this norm from a few states such as the DPRK could, however, continue.

On the other hand, the extremely pessimistic realist thought predicting the relatively uncontrolled spread of nuclear weapons, also seems to be unconvincing in a global context in which many positive non-proliferation successes have been gained, since the end of the Cold War.[36] This could be explained by the influence of the initial security dividend when the nuclear stand-off between two opposing superpower blocks ended. It showed the influence of non- security related incentives of which the developing non-proliferation norm is central, on nuclear weapon decision making. The impact of these non-security incentives on South Africa's decision making in this regard could be a relevant case to assist identifying possible factors influencing such decision making in general.

According to previous research on the incentives and disincentives influencing the South African nuclear capability decision making two main factors were identified, namely security related issues and domestic bureaucratic pressure.[37] The regional security threat South Africa was facing in the 1970s had been identified as the main incentive behind the South African nuclear programme by official government accounts and some of the scholarly studies.[38] Taking into account the strength of South Africa *vis a vis* the neighbouring states and the remoteness of direct USSR involvement in the sub-continent, it is, however, possible to call the validity of these security factors as the primary incentives in question. These same government and scholarly accounts state that the nuclear weapon capability was abandoned because of the diminishing military threat against South Africa.[39] Again it can be argued that this might be a simplistic view of the incentives playing a role in South Africa's decision to abandon the nuclear weapon capability. The domestic incentives for this decision was probably more complex especially since this decision was taken at the start of the final democratisation process in South Africa.

The domestic incentives identified by many scholars leading to South Africa's nuclear weapon programme refer to the influence of science, energy and armament interest groups in decision making. In South Africa the initial interest of the Atomic Energy Board (AEB, later the Atomic Energy Agency - AEC) in the peaceful nuclear device and later ARMSCOR in the military programme is mentioned in this regard. [40]

In the case of South Africa, current research refers to a phased development consisting of the establishment of a nuclear industry, followed by the development of a "peaceful" nuclear device and then a nuclear weapon programme. After abandoning the nuclear capability the South African government became a committed supporter of the non-proliferation norm. While all the main incentives probably influenced the South African nuclear weapon decision making, it remains unlikely that any one would adequately describe these decisions. In a study on the South African nuclear programme during which three general sources of nuclear policies, namely the security incentive, organizational politics and non-security incentives were studied, Peter Liberman came to the conclusion that because of limited evidence it is impossible to establish which of the theories best explain the reasons for South Africa's nuclear armament and disarmament.[41]

In this study it will be endeavoured to analyse these motivational factors influencing South Africa's nuclear weapon decisions more closely. In many states' nuclear weapon decisions were motivated by perceived security threats, with the aim to use such a capability as a deterrent. Such a clear vision of the utility of a nuclear weapon capability is not apparent from available studies on the creation of the South African capability. At the same time motivations for abandoning the capability are not adequately understood. The South African experience seems to indicate that no clear long term goal for its nuclear capability was formulated by the South African government and that the consequences of incremental nuclear developments were not foreseen. Each part of the programme added extra impetus to the development of the nuclear weapon programme.[42] Of specific interest would be the impact of incentives and momentum generated by especially the South African industrial-military complex, the impact of the government's threat perception and impact (if any) of the developing non-security incentives on the South African nuclear weapon decision making. This background provide the context within which the research problem could be formulated.

1.2.2. The Research Problem

Why did the South African government, both in the development and dismantling of its nuclear weapon capability, follow policies not reflecting the upcoming trends in nuclear weapon proliferation and non-proliferation. Stated differently, why did South Africa firstly develop a nuclear capability despite the growing international incentives against nuclear weapons and secondly abandon such a capability before these incentives (especially the non-security incentives) were significantly strengthened after the Cold War?

1.3 Objectives of the Study

The objectives of the study is to demonstrate that South Africa's decisions to develop and ultimately destroy its nuclear weapon capability were influenced by both reactions to domestic security and to other issues unrelated to security. South Africa obtained a fully fledged nuclear weapon programme as the result of a highly incremental approach to the nuclear weapon decision.

1.4 Structure of the Study

In answering the research problem and reaching the objectives of this study, sub-problems will be formulated. This study consist of six chapters. Chapter 1 is an introductory chapter in which the identification, demarcation and formulation of the research problem are done. The study objectives, an outline of the structure of the study and the factors that need to be addressed in reaching these objectives are provided. A brief survey of previous and related research is also given.

The first two sub-problems are dealt with in Chapter 2: *What do the concepts nuclear weapon proliferation and non-proliferation mean? What are the influences of the broader paradigms in which international relations are conducted specifically with regard to nuclear weapons proliferation and non-proliferation?* It will be necessary to define the issues proliferation and non-proliferation. Thereafter the macro framework in which concepts related to nuclear proliferation and non-proliferation can be understood, will be described. Realist, rationalist and revolutionist views of proliferation and non-proliferation will be identified and described. The contrast in views between the realist and rationalist perceptions, as identified from a wide range of scholarly works, will be examined. Whereas realist evaluations dominated the Cold War period, the growing impact of globalisation has since promoted the influence of the rationalist perspective regarding proliferation, and especially non-proliferation.

The third sub-problem is dealt with in Chapter 3: *What are the specific global incentives and disincentives influencing nuclear weapon decision making (both to obtain and abandon such a capacity)?* The incentives and disincentives that influence decision makers in acquiring a nuclear weapon capability will be examined. This examination will be based on the views of William Potter and consists of four broad clusters of incentives and disincentives for proliferation.[43] These clusters are identified as: international security and politics as well as domestic security and politics. The role of international norms, especially the impact of the non-proliferation norm, is also described in this chapter. In order to ascertain to what extend these incentives and disincentives manifest in international relations, practical cases will be of value. The mainly theoretical study of prerequisites for proliferation, incentives, disincentives and precipitating factors will thus be augmented by a brief look at four cases focussing

on China, India, Israel and Sweden. These cases mention some specific political, security and domestic influences which prompted the decision whether or not to pursue a nuclear weapon option.

Chapter 4 deals with the development of the non-proliferation norm and thus the forth sub-problem: *How did the non-proliferation norm develop and how did it create barriers for nuclear proliferation over time? What is the norm's weak and strong points*? This sub-problem will be examined in order to understand the influence of specific non-security incentives and disincentives on the South African nuclear weapon decisions. Three historical periods will be identified: The first period from 1945 to 1970 during which the norm was established, the second period from 1971 to 1990 during which the norm was strengthened and measures for international compliance were created, and the third period since 1990 when the norm matured and new challenges were identified as needing to be met. While the global norm basically relied on the willingness of states to cooperate on non-proliferation during the Cold War, the growth of international nuclear safeguards, verification, compliance measures and export controls effectively formed the non-security incentives underlying the non-proliferation norm currently.

In Chapter 5 two sub-problems will be dealt with: *How did the South African nuclear weapon programme came to being?* This includes the period from the development of a nuclear infrastructure to the period after the nuclear weapon capability was dismantled and the government adopted a non-proliferation policy. *What were the incentives and disincentives that played a role in South Africa's nuclear weapon and non-proliferation decision making?* In this chapter a short history of the South African nuclear weapon programme will be provided and factors that influenced the establishment and termination of the programme will be analysed, taking into account the four broad clusters of incentives and disincentives for proliferation as identified in Chapter 3.The purpose of analysing these motivations are twofold. Firstly to identify the main incentives, disincentives and the possible interaction between these factors and to ascertain the influence of non-security factors on these decisions, if any. Secondly, although the South African case will probably be unique in many instances, it could well prove to provide some useful lessons to the non-security disincentives, especially to the non-proliferation norm in countering nuclear proliferation. Of specific interest is the incremental nature of the programme brought about in part by a highly incremental approach to nuclear decision making in South Africa. The role of

non-security incentives is also of interest in the South African government's nuclear decision making. Domestic initiatives especially the ability of the nuclear industry to promote its agenda and the role of threat perceptions within the South African governments and bureaucratic circles, are examined with the aim to endeavour to understand their impact on this decision making.

In Chapter six the final problems relevant to this study will be answered and the outcome of the research will be provided: *What were in the final analysis the motivations for the South Africa decision making regarding nuclear weapons? Does it support the objective of this study that South Africa's nuclear weapon decision making was fundamentally influenced by the process of incremental reactions to mainly domestic security and non-security related initiatives? Does this study provide possible useful lessons for the strengthening of the non-proliferation norm?* This final chapter will consist of a summary of answers to the sub-problems, data and findings in the previous chapters. Final conclusions will be presented in an attempt to solve the research problem. Propositions applicable to the South African case and some of a general nature applicable to the global non-proliferation norm will be provided. The possible value of the study for individuals involved in nuclear non-proliferation activities or global security decision making will be highlighted and areas for future research will be identified.

1.5 Methodology

The approach to this study is descriptive-analytical. An attempt is made to create, through the evaluation of rational decision making, an explanation for the cause of events related to nuclear weapon decision making. The nuclear weapon decision refers specifically to the decision some governments take to obtain a nuclear weapon capability. For the purposes of this study the decision to abandon a nuclear weapon capability or the programme to develop such a capability is also included under the concept of a nuclear weapon decision. The historical data but especially the cause of events related to proliferation and non-proliferation will be interpreted logically to ascertain the effect of factors on policies, norms, views and actions.[44]

A study of literature pertaining to relevant aspects focussing on the phenomena of proliferation and non-

proliferation in particular will be undertaken.[45] The descriptive-analytical method is used in this study, seeing that it is appropriate for data that is primarily of documentary nature.[46] The development of security perceptions relating to the role of nuclear weapons since their inception in 1945 will be taken into account in describing the evolution of measures limiting its spread. Firstly, the paradigms (as mentioned above) within which the phenomena could be analysed, will be described. The link between these macro views and the development of the non-proliferation norm will be described and the close link between the realist view during the Cold War and the growing influence of the rationalist perceptions since the end of the Cold War, illustrated. The incentives and disincentives for a nuclear weapon capability will be listed and described. These will also be highlighted by examples of nuclear weapon decision making in China, India, Israel and Sweden. The scope of this study is too limited to focus on all nuclear proliferating states' motivations to develop nuclear weapons and these few states are chosen to present some practical examples of nuclear proliferation relevant decision making. The development of the non-proliferation norm is also positioned in its historic context. In the South African case study the security and political factors, both international and national, will be analysed in the decisions leading up to the nuclear weapon capability and the rollback of that capability.

1.6 Sources

Sources for the purposes of researching this problem are available. Most of the sources on the global dimensions of nuclear proliferation and non-proliferation are of US and European origin and thus not reflecting a developing world view on many of the issues relevant to this study. This is because of the domination of nuclear security strategic issues debated in the US since the start of the nuclear era. Nuclear deterrence and later nuclear arms limitation were the main focus of strategic security studies during the Cold War. Issues relating to non-proliferation, especially since the 1990s, interested a wider spectrum of scholars although these individuals still largely originate from developed countries. Many scholars are researching nuclear security and non-proliferation issues and an abundance of secondary sources are available. Seeing that these issues especially during the Cold War were also mainly of interest to developed states, most of the sources originate from these states. Developing world views on proliferation and non-proliferation (although limited mainly to a few Indian scholars) and their criticism of the traditional views will be taken into account where appropriate. Primary sources available on the

international aspects regarding nuclear non-proliferation are the documentation of international organizations, treaties, agreements and arrangements.

Primary sources for researching the South African decision making regarding the nuclear weapon programme are limited and use is made of interviews and secondary sources. The decision to destroy South Africa's nuclear capability included all official documentation generated and linked to the nuclear weapon programme. All documentation at Advena (entity which managed the military programme) were regarded as classified, even open documentation.[47] These documents were consequently destroyed. The programme was conducted in complete secrecy from the start, also eliminating the possibility of any primary source material outside Advena. Sources available for researching the incentives and disincentives for this programme are limited to the following: Firstly published books and papers produced during the relevant period of South Africa's nuclear device and weapon programmes on the possible motives for the start and demise of this programme. Such publications indicating the strategic thought of influential individuals and political leaders of South Africa are also relevant in establishing the milieu in which these decisions were taken. The primary sources were mainly interviews with individuals who were either involved with, or personally knowledgeable on the South African nuclear weapon programme.

1.7 Previous and Related Research

This research study does not stand in isolation. The threat posed by nuclear proliferation and studies on nuclear posture and strategy have been themes of intensive research in academic and policy circles since the dawn of the nuclear age. The vast majority of earlier studies were conducted by US scholars and government officials because this threat remains a significant US study theme up to the present. Scholars from other nuclear weapon states also focussed significantly on issues pertaining to nuclear strategy and posture. Studies conducted in the former USSR and China are not freely available because of excessive secrecy in their societies, language barriers and the previous lack of independent academic research on these issues.

International opinions regarding the world order were influenced by the realist, Hans Morgenthau's

views. Morgenthau distrusted international law and regarded the world order as a "struggle for power".[48] Scholars including Brodie, Snyder, Wohlstetter, Kahn and Bull refined realist thinking, focussing on issues such as the balance of power, deterrence and mutual assured destruction. The writings of these scholars which were often policy-oriented, had wide currency both in official and academic circles.[49]

During the 1950s and early 1960s the issue of non-proliferation was not very much a theme for scholarly research seeing that the non-proliferation norm was still in the early developmental state. Governments (especially those without the will and or capacity to develop nuclear weapons) and non-governmental organizations such as Pugwash, started work within the international multilateral forums by laying the foundation for the non-proliferation norm. Initiatives within the context of the United Nations, as well as politically and technically orientated negotiations between the US and USSR, assisted in creating the conditions for the development of this norm. The coming into force of the Treaty on the Non-Proliferation of Nuclear Weapons (NPT) in 1970 remained a significant milestone in the future development of this norm. Some scholarly publications focussing on issues related to non-proliferation have been published since the early 1970s. These publications primarily focussed on the capabilities and potential capabilities of nuclear threshold states and multi-lateral efforts to negotiate and promote non-proliferation.[50]

On the macro level the increased interest in issues related to interdependence and integration supported the initiation of research on nuclear non-proliferation as a phenomenon. Karl Deutsch described the "transactional" approach to integration theory, theorizing that growth in the volume and frequency of communication and transactions between states, increases integration. The role of international institutions was stressed by Ernst Haas and the effects of interdependence in international politics applied to situations characterized by reciprocal effects among states or among actors in different states. The end of the Cold War brought a reassessment of the importance of non-proliferation. David Mutimer noted that from only seven articles on proliferation between 1985 and 1989 in prominent security journals, the literature grew to nine articles between 1989 and 1991, and exploded to include 56 articles between 1991 and 1994.[51] The focus of these articles were inter alia on challenges facing the non-proliferation regime with studies of Iraq and the DPRK prominent. At the same time studies also focussed on the successes of non-proliferation in South Africa, Brazil and Argentina.

In South Africa research on issues related to nuclear proliferation was rather limited. Lukas Daniel Barnard, in his doctoral dissertation, stated that because of the lawless nature of the international environment, a state could only ensure its political sovereignty and survival by using its own power.[52] Just prior to the start of the military nuclear programme in South Africa, Barnard undertook research on nuclear strategy in the US, as a result of which he wrote two papers on nuclear proliferation and the strategy of deterrence. In both of these papers he stated that nuclear weapons would enhance the security of the small state.[53] As a result of his initial initiative some research on nuclear proliferation related issues was conducted at the University of the Orange Free State (UOFS).[54] While many non-South African and exiled South African scholars and researchers also speculated on a possible South African nuclear weapon capability since the early 1970s, the secrecy surrounding the nuclear weapon programme made it impossible for these individuals to confirm its existence. Some of the possible factors motivating a nuclear weapon programme in South Africa were, however, identified by these individuals.[55] After the existence of the programme had been made public in 1993, a number of research papers were published on the programme of which the most authoritative had been by David Albright and Waldo Stumpf.[56] The lack of primary documentary sources limited subsequent research to mainly the recollections of individuals involved and or knowledgeable on the South African nuclear weapon programme.

1.8 Notes

1. Iklé, F.C. "The Second Coming of the Nuclear Age," Foreign Affairs, Vol. 75, No. 1, January/February 1996, p. 119.

2. Norris, J. and Fowler, W. NBC: Nuclear, Biological and Chemical Warfare on the Modern Battlefield, Brassey's (UK) Ltd, London, 1997, p. 36.

3. Heater, D. and Berridge, G.R. Introduction to International Politics, Harvester Wheatsheaf, Hemel Hempstead, 1993, p. 34.

4. The states known to posses nuclear weapons are the US, United Kingdom, France, Russia, China, Israel, India and Pakistan. Jayantha Dhanapala, the UN undersecretary-general for disarmament affairs stated in September 2002 that there were 30 000 nuclear warheads in the world at that stage. SAPA Report, "No World Peace with Arms," 12 September 2002. Also see The Ploughshares Institute, "Nuclear Weapons at a Glance," http://www.ploughshares.ca/content/ABOLISH%20NUCS/rtglance.html (30 August 1999).

5. Yaukey, J. "Spread of Weapons threatens Security," Gammett News Service, 12 October 2003,http://www.lancastereaglegazette.com/news/stories/20031012/localnews/441850.html (12 October 2003)

6. Rogov, S. "Discussion on the New Russian Military Doctrine," Krasnaya Zvezda, 1 November 1999.

7. Reiss, M. Bridled Ambition: Why Countries Constrain Their Nuclear Capabilities, Woodrow Wilson Center Press, Washington D.C., 1995, p. 2.

8. See remarks by Condoleeza Rice on the US foreign policy initiatives during a CNN World Conference at the Renaissance Hotel in Washington DC on 1 June 2001. She stated that the US needs "... to protect against today's threats through a comprehensive strategy that includes strengthened non-proliferation and counter proliferation measures, as well as a new concept of deterrence that includes defenses and a smaller nuclear arsenal. And we need to recognize that just as peace is not the absence of war, stability is not a balance of terror." CNN, 1 June 2001.

8. Middleton, H. "Throw France out of the Pacific," The Guardian (Australia), 2 August 1995.

10. Oxford Analytica Report, "India/Pakistan: Politics could Widen Military Conflict," 27 May 2002.

11. See Sagan, S.D. "Why do States Build Nuclear Weapons? Three Models in Search of a Bomb," International Security, Vol. 21, No. 3, Winter 1996/97, pp. 73 - 85.

12. According to the nuclear weapon state initiated conceptualization of non-proliferation, it only refers to the spread of nuclear weapons to additional states (horizontal proliferation) and not to the enhancing of capabilities by existing nuclear powers (vertical proliferation). Dougherty, J.E. and Pfaltzgraff, R.L. (Jr) Contending Theories of International Relations: A Comprehensive Survey, Harper and Row, New York, 1981, p. 398.

13. The Nuclear Non-Proliferation Treaty (NPT) is the cornerstone on which the non-proliferation norm is build. See Chapter 3 for a description and evaluation of its role in the development of the non-proliferation norm.

14. See Chapter 5, Reiss, M. Bridled Ambition: Why Countries Constrain Their Nuclear Capabilities, The Woodrow Wilson Center Press, Washington D.C., 1995.

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26. Sagan, S.D. op.cit, p. 54.

27. See for example Feaver, P.D. "Proliferation Optimism and Theories of Nuclear Operations," in Davis, Z. S. and Frankel, B. (Ed), op.cit.

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32. Potter, W.C. Nuclear Power and Nonproliferation: An Interdisciplinary Perspective, Oelgeschlager, Gunn and Hain, Ca

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33. Sagan, S.D. op.cit, pp. 54 - 86.

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35. Potter, W.C. op.cit, p. 140.

36. The renunciation of nuclear arms by some of the potential proliferants is one of the striking modern trends manifesting from the end of the Cold War. The list of states falling most into this category includes:

- South Africa, which has acknowledged building an undeclared, and now dismantled, nuclear arsenal comprising six nuclear weapons;
- Brazil, which has acknowledged pursuing a nuclear weapons programme during the 1980's and had developed the essential technologies for this effort;
- Argentina, which apparently pursued a nuclear weapon programme in the late 1970s and early 1980s and had similarly developed the essential technologies;
- Romania, which apparently initiated such a programme in the 1980's under the Ceausescu Government but made considerably less technological progress;
- Algeria, which accepted IAEA full-scope safeguards and became a NPT member after the secret acquisition of a large research reactor from the People's Republic of China in the early 1980's was seen by some states as taking a first step towards development of a nuclear weapons infrastructure;
- Ukraine, Belarus and Kazakhstan, which joined the NPT as non-nuclear weapon states (NNWS) by returning all nuclear weapons to Russia.

See Spector, L.S. and McDonough, M.G. Tracking Nuclear Proliferation: A Guide in Maps and Charts, 1995, Carnegie Endowment for International Peace, Washington DC, 1995, p. 13 - 14.

37. See for example Stumpf, W. "Birth and Death of the South African Nuclear Weapons Programme," Presentation given at the Conference "Fifty Years after Hiroshima", organised by USPID (Unione Scienziati per il Disarmo) and held in Castiglioncello, Italy, 28 September to 2 October 1995, http://www.aec.co.za/strategy.htm., (11 May 1999) and Albright, D.South

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