UN Security Council resolutions 687, 707 and 715 and their implications for a halt of all proliferation prone nuclear activities — a technical and legal assessment

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1 INTRODUCTION

In paragraph 13 of United Nations Security Council (UNSC) resolution 687 [1,2] adopted on 3 April 1991, the International Atomic Energy Agency (IAEA) was requested by the Security Council to carry out immediate on-site inspection of Iraq's nuclear capabilities and carry out a plan for the destruction, removal or rendering harmless of items prohibited to Iraq under paragraph 12 of the resolution 687. On 15 August 1991 the Security Council adopted a further resolution, number 707 [3], obliging Iraq to "*halt all nuclear activities of any kind, except for use of isotopes for medical, agricultural or industrial purposes*, until the Council determines that Iraq is in full compliance with the present resolution and with paragraphs 12 and 13 of resolution 687 (1991) and the Agency determines that Iraq is in full compliance with its safeguards agreement with the Agency".

The plan, and the annexes thereto, which constitute an integral part of the plan, were approved by the UNSC in resolution 715 [4] as document number S/22872/Rev.1, 20 September 1991 [5]. This unprecedented document, drafted with Iraq's specific case in mind, is in fact the first legally binding document in which all activities prone to nuclear weapon proliferation are clearly and comprehensively defined. It is the first time that in an official document, the many ambiguous activities which broadly come under the name of 'peaceful nuclear activities', as well as those which are generally considered as non-military scientific research activities, are explicitly recognized as important for the acquisition or development of nuclear weapons. Similarly, by clearly defining those applications of nuclear physics and nuclear energy that are useful for 'medical, agricultural or industrial purposes', this document also defines which kind of 'peaceful nuclear activities' are really benign from the point of view of nuclear weapon proliferation.

In practice, in obliging Iraq "not to acquire or develop nuclear weapons or nuclear-weapons-usable material or any subsystems or components or any research, development, support or manufacturing facilities related to the above" (article 12 of resolution 687), the UNSC developed and accepted a document unambiguously defining what in essence is a *nuclear free zone* and created a legal precedent which makes Iraq the first example of such a zone. This precedent is particularly significant because it included the development of procedures and equipments for ongoing monitoring and verification, which are now applied in Iraq.

2 TECHNICAL ASSESSMENT

Annex 1 of document S/22872 defines activities prohibited or permitted under resolutions 687 and 707. It is completed by Annex 3, a fifteen page long list of all items specifically prohibited, or may be prohibited if used in prohibited activities, and by Annex 4 which details permitted activities. Significantly, Annex 1 and Annex 3 are much more encompassing and comprehensive than any previous official documents listing equipment and materials subject to nuclear export controls, including the so-called 'Zangger list' or London Guidelines [6]. **Considering the importance of these annexes for future discussions, Annex 1 is reproduced in the Appendix.**

A salient feature of Annex 1 is that it makes a clear distinction between activities prohibited by resolutions 687 and 707. Activities prohibited by resolution 687 (paragraphs 2.1-2.9 of Annex 1) are those which are clearly prohibited to non-nuclear-weapon states by the Nuclear Non-Proliferation Treaty (NPT) and those

constituting a direct short-term nuclear weapon proliferation threat in case of diversion or misuse, and therefore put under IAEA safeguards.

The prohibition of nuclear activities by resolution 707 (paragraphs 2.10-2.18 of Annex 1) is much more comprehensive; it comprises all possible nuclear activities except applications of isotopes to agriculture, industry and medicine (paragraphs 2.19-2.21). While the activities put under IAEA safeguards are essentially those related to nuclear power generation by means of fission reactors, resolution 707 prohibition extends to *nuclear fusion* based on magnetic or inertial confinement (paragraph 2.15), *production of isotopes* of any kind (paragraph 2.16) and the use of *particle accelerators* of all types (paragraph 2.17).

In other words, resolution 707 is a legal implementation of the suggestions made in 1980 that international safeguard measures should be extended to particle accelerator and fusion technologies [7,8], and an explicit recognition of the fact that these technologies constitute a direct threat for nuclear weapon proliferation. A first step in that direction is that tritium and lithium-6 are now included in the list of nuclear-related dual-use equipment and material and related technology mentioned in the Warsaw Guidelines [9]. But, 'fusion' and 'accelerators' are not even mentioned as dual-use technologies, even though both technologies can be used to breed fissile material [8], tritium [10] or antimatter [11] for military purposes. Similarly, in the amended London Guidelines [12], the only change has been to include the full range of enrichment technologies without any reference to fusion materials or technologies. Finally, the Wassenaar Arrangement — which in April 1996 succeeded to the Coordinating Committee on Export Controls (COCOM) two years after it ceased to exist — includes several lists of sensitive dual-use equipment. These lists, however, only refer to particle accelerator and fusion technologies in the context of directed energy weapons, and to lasers as a controlled technology, without any explicit reference to their use in the nuclear fuel cycle of for thermonuclear fusion [13].

A second important feature of Annex 1 is that it prohibits not only "design, manufacturing, import of systems, equipment and components, pilot plant construction, commissioning and operation, or utilization," but also *research and development* on all nuclear activities excepted those permitted by paragraphs 2.19-2.21. This is a very important novelty because, until resolutions 687 and 707, research and development activities have always been excluded in arms control agreements [14]. For example, Article II of the NPT only forbids the *manufacture* of nuclear weapons by non-nuclear-weapon States.

In more recent agreements not specifically related to Iraq, the scope of the control of research and development is less generously defined. For example, research and development is explicitly mentioned in the Warsaw guidelines [9].

In particular, “suppliers should not authorize transfers of equipment, material, or related technology (...) for use in a non-nuclear- weapon state in a nuclear explosive activity (where) ’nuclear explosive activity’ includes research on or development (...) on any nuclear device or components or subsystems of such a device” [9]. But the limited range of technologies covered by these guidelines leaves open the possibility of conducting proliferation prone research activities using particle accelerators and fusion technologies. Such activities are not possible in the African Nuclear-Weapon-Free Zone where Article 3 of the Treaty of Pelindaba explicitly prohibits conducting “research on (...) any nuclear explosive device by any means anywhere” [15]. However, as in the Warsaw guidelines, this prohibition only applies to *nuclear explosives*. In resolutions 687 and 707 prohibition of research applies to *all nuclear activities* (including fundamental research) except research on application of radiation and isotopes in food and agriculture, medicine and industrial processes.

3 LEGAL ASSESSMENT

The political implications and the legal status of resolutions adopted by the UNSC has been an issue of extensive discussions since the foundation of the UN more than fifty years ago. Whereas this was more or less of purely academic interest during the period of the Cold War due to the political limitations of the UNSC, the changed global political climate has allowed for new developments in this field that are of importance for practical purposes [16].

Today, it is mostly recognized that the UNSC has quasi-legislative and quasi-judicial authority with regard to the implementations of the provisions in Chapter VII of the UN Charter, i.e., when there is a threat to the international peace, breach of the peace or act of aggression [17,18]. In the case of UNSC resolutions 687, 707 and 715 that were adopted in connection with Iraq’s aggression against Kuwait the UNSC intended to reach several objectives, e.g., the implementation of a cease-fire agreement and an arms control regime (comprising the elimination of nuclear, chemical and biological weapons) upon Iraq (comprising the total elimination of nuclear, chemical and biological weapons including the corresponding production capabilities), a solution to the boundary dispute between the two states and the settlement of economic issues related to the former occupation of Kuwait by Iraq.

The legal nature of UNSC resolutions and the legislative authority of the UNSC within the UN setting [17] can be characterized in the following way:

- legal acts are generated in a unilateral form, namely through the adoption of

resolutions by the UNSC,

- a special legal norm is created or a general legal norm is modified, in our case given by a significant extension of Iraq's existing safeguards obligations.

Therefore, when we consider the legal status of UNSC resolutions 687, 707, 715 and the corresponding plan for their implementation that is given by the document S/22872/Rev.1, and following the respective legal expertise [17,18], we arrive at a new comprehensive and legally binding definition of all proliferation prone activities in the context of mastering the dismantling of the clandestine Iraqi nuclear weapons programme. Clearly, these developments can have substantial implications on further political and legal activities in this field, in particular in connection with current efforts to strengthen the IAEA safeguards regime.

Of course, there are a variety of possible objections that can be made to our line of argumentation. From a political point of view it can be argued that the UNSC, because of its limited and biased membership [19], cannot be accepted as a 'lawmaking' authority. One can very reasonably support the opinion that the UNSC is not empowered to impose upon UN members such binding rules that are not restricted in their application to a specific case the UNSC has explicitly dealt with before.

However, we have to take into consideration that the UNSC by adopting the resolutions mentioned above did not exclusively act with regard to the provisions of Chapter VII of the UN Charter but also in order to enforce Iraq's obligations under the NPT and to secure its future compliance after having broken crucial provisions of this treaty. Since the NPT is an international legal instrument with nearly global adherence, the legal consequences for the NPT regime as a whole cannot be neglected. In this sense the UNSC resolutions and the corresponding action plan should also be seen as implementation measures of the nuclear non-proliferation regime that had to be adopted in order to deal with with a situation where basic obligations of the NPT were violated. It cannot be denied that the UNSC has created in this way a new interpretation with regard to an effective implementation of the corresponding NPT provisions. The revelation of an extensive clandestine nuclear weapons research and development programme in Iraq has forced the UNSC to expand the scope of the existing IAEA safeguards system via adoption of resolution 707 and 715 in order to ensure Iraq's compliance with Art.II of the NPT.

4 CONCLUSION

In this article we have tried to give an assessment of the non-proliferation implications of the UNSC resolutions aiming at the containment of Iraq's nuclear ambitions. By necessity, it was important to rely on a technical and legal analysis.

Because of the increasing complexity of technological development, it will be more and more important to approach emerging proliferation concerns at the earliest possible stage. In order to meet this objective, the necessary legal framework has to be continuously adapted. In this perspective, the case studied in this paper shows several directions for possible future development:

- first, the scope of international treaties and arrangements should include all materials and technologies related to fission, fusion [20], acceleration and annihilation processes;
- second, the treaties and arrangements should include effective measures of *preventive arms control* [21], such as legally binding restrictions in all relevant areas of research and development, whether they are claimed to be for military or civilian purpose;
- third, the concept of 'peaceful nuclear activities' should be given a well accepted and unambiguous meaning by making explicit which materials, technologies and activities are really benign from the point of view of nuclear weapon proliferation. This is of crucial importance for the creation of genuine *nuclear weapon free zones* and for serious discussions on a total abolition of nuclear weapons.

In all three of these points the UNSC resolutions considered in this paper provide useful legal precedents. Moreover, our analysis indicates that the corresponding UNSC resolutions 687, 707 and 715 could be used in the future as the basis for a legally binding definition of all proliferation prone nuclear activities. Finally, not only did the events in Iraq partly trigger the still continuing 93+2 discussions on the IAEA safeguards system, but they obliged the international community to create what in essence is a *nuclear free zone* and to develop adequate monitoring and verification procedures and equipment.

It is therefore likely that future developments will show that the case studied in this paper will help to put additional pressure on the continuing process of expanding the scope of existing safeguards agreements.

5 NOTES AND REFERENCES

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[1] UN document S/RES/687, 8 April 1991. Source: UN, Resolutions and Decisions of the Security Council 1991, Security Council Official Records: Forty-Sixth Year (United Nations, New York, 1993) pp. 11-13. Reproduced in [2] pp. 331-336.

[2] R. Kokoski, Technology and the Proliferation of Nuclear Weapons, SIPRI (Oxford University Press, Oxford, 1995).

[3] UN document S/RES/707, 15 Aug. 1991. Source: UN, Resolutions and Decisions of the Security Council 1991, Security Council Official Records: Forty-Sixth Year (United Nations, New York, 1993) pp. 22-24. Reproduced in [2] pp. 336-338.

[4] UN document S/RES/715, 11 Oct. 1991. Source: UN, Resolutions and Decisions of the Security Council 1991, Security Council Official Records: Forty-Sixth Year (United Nations, New York, 1993) pp. 26-27. Reproduced in [2] pp. 339-340.

[5] Official Records of the Security Council, Forty-Sixth Year, Supplement for Oct., Nov. and Dec. 1991, document S/22872/Rev.1 and Corr.1.

[6] Guidelines for Nuclear Transfers, IAEA document INFCIRC209 Rev.1, November 1990.

[7] A. Gsponer, Particle accelerators and fusion technologies: Implications on horizontal and vertical proliferation of nuclear weapons, GIPRI-80-03 (1980) 23 pp. Report distributed to the Heads of delegation to the 1980 NPT Review Conference.

[8] A. Gsponer, B. Jasani and S. Sahin, 'Emerging nuclear energy systems and nuclear weapon proliferation', Atomkernenergie/Kerntechnik, Vol. 43, (1983) pp. 169-174.

[9] Guidelines for transfers of Nuclear-related Dual-use equipment, material,

and related technology (Warsaw Guidelines), IAEA document INFCIRC/254/ Rev.1/ Part 2, July 1992. Reproduced in [2] pp. 312-330. In the latest version of these Guidelines (INFCIRC/254/Rev.2/Part 2/Mod.1/Add.1, 7 June 1996) the only amendment pertinent to our subject is the inclusion of lithium isotope separation facilities.

[10] M.T. Wilson et al., Accelerator production of tritium (APT), Proc. of the 1989 Particle Accelerator Conference (1989) 761; J. Weisman, 'Could defense accelerator be a windfall for science?', Science, Vol. 269, (18 August 1995) pp. 914-915; J. Glanz, 'Los Alamos wins one in tritium race', Science, Vol. 273 (13 October 1995) pp. 227-228.

[11] A. Gsponer and J.P. Hurni, 'Antimatter induced fusion and thermonuclear explosions', Atomkernenergie/Kerntechnik, Vol. 49, (1987) pp. 198-203; M. Thee (ed.), Antimatter Technology for Military Purposes, Bulletin of Peace Proposals, Vol. 19, (1988) pp. 443-470.

[12] Guidelines for Nuclear Transfers (Revised 1977 London Guidelines), IAEA document INFCIRC/254/Rev.1/Part 1/Mod. 2, Annex (amended), IAEA, Vienna, Apr. 1994. Reproduced in [2] pp. 291-312. In the latest version of these Guidelines (INFCIRC/254/Rev.2/Part 1/Add.1, 7 June 1996) there is no changes pertinent to our subject.

[13] The Wassenaar Arrangement controls the export of weapons and dual-use goods, that is, goods that can be used both for a military and a civil purpose. The lists of equipment, materials and related technologies which are part of the Arrangement do not refer to nuclear or thermonuclear materials except for radioactive materials used for nuclear heat sources (Dual-use list, Advanced materials, NF(96)DG CAT1/WP2 (16 March 1996) p.21); Export of a wide range of laser types, including lasers usable for inertial-confinement fusion and nuclear weapons research, is restricted (Dual-use list, Sensors and lasers, NF(96)DG CAT6/WP2 (16 March 1996) p.27-44); Export of "lasers of sufficient continuous wave or pulsed power to effect destruction similar to the manner of conventional ammunition", and "particle accelerators which project a charged or neutral beam with destructive power" are restricted in the Directed energy weapons systems section of the Munition list (Munitions list, NF(96)DG ML/WP2 (16 March 1996) p.46).

[14] A. Schaper, 'Arms control at the stage of research and development? - The case of inertial confinement fusion', Science & Global Security, Vol. 2, (1991) pp. 279-299; H. G. Brauch et al. (eds), Controlling the Development and Spread of Military Technology (Vu University Press, Amsterdam, 1992). Chapter 10; W.A Smith, J. Altmann and W. Liebert, in J. Altmann et al. (eds), Verification after the Cold War (Vu University Press, Amsterdam, 1994) pp. 46-56, 225-233, 234-241.

[15] 'The African Nuclear-Weapon-Free Zone Treaty (The Treaty of Pelindaba)' reproduced in Security Dialogue 1996, Vol.27(2) pp. 233-240.

[16] R. Higgins, Problems & Process - International Law and How We Use It, Clarendon Press, Oxford (1994), Chapters 2 and 15.

[17] F.L. Kirgis, 'The Security Council's First Fifty Years', American Journal of International Law, Vol. 89, (1995) pp. 506-539.

[18] J.E. Alvarez, 'Judging the Security Council', American Journal of International Law, Vol. 90, (1996) pp. 1-39.

[19] M.C. Wood, 'Security Council Working Methods and Procedure: Recent Developments', International and Comparative Law Quarterly, Vol. 45, (1996) pp. 150-161 .

[20] An urgent need is an effective international control of tritium. See: L.C. Colschen and M.B. Kalinowski, Can international safeguards be expanded to cover tritium?, Proc. IAEA Symposium on International Safeguards, Vienna (March 14-18, 1994) Vol. 1, IAEA-SM-333/27; M.B. Kalinowski and L.C. Colschen, International Control of Tritium to Prevent Horizontal Proliferation and to Foster Nuclear Disarmament, Science and Global Security, Vol 5, (1995) pp. 131-203.

[21] W. Liebert, Verifying research and development limitations 3/4 Relevance for preventive arms control and nuclear non-proliferation, in J. Altmann et al. (eds), Verification after the Cold War (Vu University Press, Amsterdam, 1994) pp. 234-241.

6 APPENDIX:

Annex 1 of UN Security Council document S/22872/Rev.1

DEFINITIONS

For the purpose of UN Security Council Resolutions 687 and 707, the following definitions will be adopted:

NUCLEAR MATERIAL

1.1 "Source material"

Uranium containing the mixture of isotopes occurring in nature; uranium depleted

in the isotope 235; thorium; any of the foregoing in the form of metal, alloy, chemical compound or concentrate.

1.2 "Special fissionable material"
Plutonium-239; uranium-235; uranium-233; uranium enriched in the isotopes 235 or 233; any material containing one or more of the foregoing.

1.3 "Nuclear-weapon-usable material"
Nuclear material that can be used for the manufacture of nuclear explosive components without transmutation or further enrichment, such as plutonium containing less than 80 % plutonium-238, uranium enriched to 20 % uranium- 235 and uranium-233 or more; any chemical compound or mixture of the foregoing. Plutonium, uranium-233 and uranium enriched to less than 20 % uranium-235 contained in irradiated fuel do not fall into this category.

NUCLEAR ACTIVITIES

2.1-2.9 (inclusive) refer to activities prohibited under both Resolutions 687 and 707.

Any activity such as research and development, design, manufacturing, import of systems, equipment and components, pilot plant and plant construction, commissioning and operation, or utilization in one or more of the following:

2.1 Production of nuclear weapons

2.2 Production and any use of nuclear-weapon-usable material

2.3 Production of metals and alloys containing plutonium or uranium

2.4 Weaponization
This covers the research, development, manufacturing and testing required to make nuclear explosives from special fissonable material.

2.5 Nuclear fuel fabrication using plutonium, uranium-233, uranium enriched to 20 % or more in uranium-235.

2.6 Import, construction or use of research and power reactors of any kind utilizing uranium enriched to $\geq$ 20 % in uranium-235, uranium-233, plutonium or MOX as a fuel or any reactor designed specifically for plutonium production. This includes critical and subcritical assemblies.

2.7 Reprocessing of irradiated fuel
Including the use of hot cells and the associated equipment

2.8 Enrichment of uranium in the isotope 235 and any preparatory steps in this process, including the preparation of UCl_4 and UF_6.

2.9 Production and separation of the isotopes of plutonium, hydrogen, lithium and boron

2.10-2.18 (inclusive) refer to activities, permitted under resolution 687 but prohibited under 707.

Any activity such as research and development, design, manufacturing, import of systems, equipment and components, pilot plant construction, commissioning and operation, or utilization in one or more of the following:

2.10 Import, construction or use of research and power reactors of any type utilizing natural uranium or uranium enriched to less than 20 % in uranium-235 as fuel. This includes critical and sub-critical assemblies, but excludes reactors specifically designed for plutonium production.

2.11 Prospecting, mining or processing of ores containing uranium and/or thorium

2.12 Preparation of chemical compounds containing uranium enriched to less than 20 % in uranium-235 and thorium, excluding the preparation of UCl_4 and UF_6.

2.13 Nuclear fuel fabrication using natural uranium or uranium enriched to less than 20 % in uranium-235.

2.14 Processing and disposal of radioactive wastes

2.15 Nuclear fusion experimental devices based on magnetic or inertial confinement, including diagnostics

2.16 Production of isotopes both radioactive and stable. The production of the isotopes of plutonium, hydrogen, lithium, boron and uranium is prohibited.

2.17 Import, construction and use of neutron sources, electron accelerators, particle accelerators, heavy ion accelerators

2.18 Research on radiation physics and chemistry and on the physical and chemical properties of isotopes except in area relevant to items 2.19, 2.20 and 2.21

2.19-2.21 (inclusive) refer to activities permitted under resolution 707

2.19 Application of radiation and isotopes in food and agriculture

2.20 Applications of radiation and isotopes in medicine

2.21 Application of radiation and isotopes in industrial processes