One Step Back? Duties Relating to the Rescue of Astronauts in Orbit under the ARRA*

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Abstract

This paper undertakes to address the obligations regarding the rescue of astronauts which are established by the OST and the ARRA. The authors will give an overview of the currently existing provisions and will elaborate on the differences and similarities of the relevant norms concerning the duties owed to humans experiencing situations of distress in orbit. Taking into account the *trauvaux préparatoires* and the technical developments since the drafting, the authors will show whether or not the current legal regime establishes sufficient rules to ensure the rescue of people suffering distress in orbit and if it needs further elaboration.

I. Introduction

Five Space Treaties were drafted under the auspices of the United Nations between 1962[1] and 1979[2]. The first one, the OST,[3] is known as the *Magna Carta*

* All views expressed are the personal views of the authors.

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1 Cf. UN Doc. A/AC.105/6, 9 July 1962, para. 11ff.

2 Cf. UNGA Res. 34/68, Agreement Governing the Activities of States on the Moon and Other Celestial Bodies (5 December 1979).

3 Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies, 610 UNTS 250.

of space law,[4] while the following treaties[5] concretizes on the principles established by the OST.[6] However, the ARRA falls short of the principle stated in Art. V para. 2 OST, that "[i]n carrying on activities in outer space […] astronauts of one State Party shall render all possible assistance to the astronauts of other States Parties". Although references to "personnel of a spacecraft" in a situation of distress in orbit are made, the ARRA does not elaborate on an obligation relating to assistance to and rescue of this personnel.
Whether or not this has to be regarded as a *lacuna* concerning rescue in space will be discussed in the following.

II. Current Legal Regime

Outer Space Treaty

According to Art. V OST State Parties and their astronauts shall extend all possible assistance to other State Parties and their astronauts.
The wording of Art. V para 1 OST clearly indicates that the situation of accident, distress or emergency landing has to take place either in the territory of a State Party or on the high seas and is thus limited to terrestrial application.[7]

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4 This wording was already used in the drafting negotiations, cf. UN Doc. A/AC.105/C.2/SR.2, 21 August 1962, p. 6, Mr. Spacil (Czechoslovakia); Abdurrasyid, P., *Certain Views on the Agreement on Rescue of Astronauts, the Return of Astronauts and the Return of Objects launched into Outer Space*, in: Jasentuliyana, N. (ed.), Maintaining Outer Space For Peaceful Uses, The United Nations University, Japan 1984, p. 99; see Hobe, S., *Historical Background*, in Hobe, S./ Schmidt-Tedd, B./Schrogl, K.-U. (eds.), Cologne Commentary on Space Law, Volume I, Heymanns, Cologne 2010, p. 14, mn. 44, p. 16, mn. 50; Lyall, F./ Larsen, P. B., *Space Law – A Treatise*, Ashgate, Farnham *et al.* 2009, p. 53; and Spencer, R. L., *International Space Law: A Basis for National Regulation*, in: Jakhu, R. (ed.), National Regulation of Space Activities, Springer, Dordrecht *et al.* 2010, p. 5.

5 Agreement on the Rescue of Astronauts, the Return of Astronauts and the Return of Objects Launched into Outer Space, 672 UNTS 119; Convention on International Liability for Damage Caused by Space Objects, 961 UNTS 187; Convention on Registration of Objects Launched into Outer Space, 1023 UNTS 15; Agreement Governing the Activities of States on the Moon and Other Celestial Bodies, 1363 UNTS 3.

6 For the ARRA cf. Dembling, P. G./ Arons, D. M., *The Treaty on Rescue and Return of Astronauts and Space Objects*, 9 Wm. & Mary Law Review 630 (1968-1969), p. 642.

7 Cf. Achilleas, P., *L'astronaute en droit international*, in: ECSL/ESA/IDEST/ UNESCO (eds.), Legal and ethical framework for astronauts in space sojourns, Proceedings of a Symposium held on 29 October 2004, Paris 2004, p. 18f.; and von der Dunk, F./ Goh, G. M., *Article V OST*, in Hobe, S./ Schmidt-Tedd, B./ Schrogl, K.-U. (eds.), Cologne Commentary on Space Law, Vol. I, Heymanns, Cologne 2010, p. 95, mn. 2, 21f.

Whereas Art. V para. 2 OST speaks of assistance "in carrying on activities in outer space" and is thereby also including an obligation to render assistance while being in or traveling through Outer Space, respectively.[8]
Despite the efforts of some delegations,[9] the term "astronaut" is not specifically defined in any of the Space Treaties. While interpreting[10] this term, the different authentic Treaty language[11] are to be kept in mind.
"Astronaut" has its origin in the Ancient Greek language. It derives from the Ancient Greek □στρον (ástron, "star") and ναύτης (naútēs, "sailor"),[12] therefore "a person sailing to the stars". The ordinary meaning of the english term "astronaut" is "a person who is trained to travel in a spacecraft".[13] Whereas according to the French term an "astronaute" is a "pilote ou passager d'un engin spatial"[14] and thus encompasses every person onboard of a spaceship. Although the French wording implicates a broader interpretation, in the times of growing commercial use of Outer Space, e.g. space tourism,[15] a clarification of the term might be appropriate.[16] This is well in line with the distinction made between professional travelers and scientists in Outer Space on the one

8 Cf. Gál, G., *Observations on the Rescue Agreement,* in: Jasentuliyana, N. (ed.), Maintaining Outer Space For Peaceful Uses, The United Nations University, Japan 1984, p. 97; and Hall, R. C., *Comments on Rescue and Return of Astronauts on Earth and in Outer Space*, in: IISL, Proceedings of the Eleventh Colloquium on the Law of Outer Space, 17-18 October 1968 New York (USA), AIAA, 1969, p. 115.

9 Cf. e.g. UN Doc. A/AC.105/C.2/L.23, in: A/AC.105/37, 14 July 1967, Annex I, p. 11.

10 According to Art. 31 (1) Vienna Convention of the Law of Treaties, 1155 UNTS 331, the text of the treaty shall be interpreted in accordance with its ordinary meaning, in its context and "in the light of its object and purpose".

11 The Chinese, English, French, Russian and Spanish Version of the OST are equally authentic, Art. XVII OST.

12 Cf. <www.oed.com/view/Entry/12274> (accessed 9 December 2013).

13 "Astronaut", Oxford Dictionaries – online edition, available at <http://oxforddictionaries.com/> (accessed 9 December 2013); This is well in line with the ordinary meaning of the Russian word "космонавт" which means "человек, испытывающий и эксплуатирующий космическую технику в космическом полете", Астрономический словарь - online edition, available at <http://dic.academic.ru/> (accessed 9 December 2013).

14 "Astronaute", Larousse Dictionaire – online edition, available at <www.larousse.fr/> (accessed 9 December 2013).

15 Next to suborbital flight opportunities, the first commercial space habitat, Gemini I of Bigelow Aerospace, is orbiting the Earth since 2006, cf. <www.bigelowaerospace.com/ genesis-1.php> (accessed 9 December 2013).

16 Cf. Achilleas, P., *L'astronaute en droit international*, in: ECSL/ESA/IDEST/ UNESCO (eds.), Legal and ethical framework for astronauts in space sojourns, Proceedings of a Symposium held on 29 October 2004, Paris 2004, p. 15f.

hand and e.g. space tourists on the other hand by the ISS Partners,[17] national legislation[18] and literature.[19] This raises the question whether the provision is also applicable to space tourists.

While interpreting Art. V OST it should still be kept in mind that it also entails a humanitarian element.[20] The idea of rendering assistance in dangerous or defenseless situations has "long roots" in international law[21] and is thus not only a moral but also a legal obligation. The fundamental principle of human dignity is codified in Art. 1 UDHR[22] and is respected as *ius cogens*.[23] Considering this and the principle of international cooperation and mutual assistance established by Art. IX sentence 1 OST it would be inhumane and contrary to international law to interpret Art. V OST restrictively and leave persons in Outer Space at their peril.

Thus, it is to summarize that even though private travellers do not fall within the term "astronaut" the provision applies to them at least analogously.

The formulation of the provision raises the question of what all possible assistance compromises. The ordinary meaning would imply that each State Party has to employ every means at its disposal to assure that the situation of distress can be mitigated and/or the astronauts can be saved. Thereby, it is to be regarded that trivial help without any emergency "only for the sake of international co-operation"[24] cannot be justified as it would hollow the *rationale* of

17 Principles for processes and criteria for selection, assignment, training, and certification of ISS (expedition and visiting) crew, adopted by the Multilateral Control Board (MCB) on 28 November 2001; the distinction is also made by the NASA and ROSCOSMOS.

18 Cf. e.g. 51 US Code Sec. 509 as revised by the Commercial Space Launch Amendments Act, 2004 (Public Law 108-429). Even though national legislation is not legally binding, it expresses a legal opinion of the State and may thereby serve as an indication to determine the meaning of a provision and to support an interpretation.

19 Cf. von der Dunk, F./Goh, G. M., *Article V OST*, in Hobe, S./Schmidt-Tedd, B./Schrogl, K.-U. (eds.), Cologne Commentary on Space Law, Vol. I, Heymanns, Cologne 2010, p. 96f., mn. 7-15.

20 Cf. Cheng, B., *Studies in Space Law*, Clarendon Press, Oxford 1997, p. 460; and von der Dunk, F./Goh, G. M., *Article V OST*, in Hobe, S./Schmidt-Tedd, B./Schrogl, K.-U. (eds.), Cologne Commentary on Space Law, Vol. I, Heymanns, Cologne 2010, p. 95, mn. 1.

21 Cf. Lyall, F./Larsen, P. B., *Space Law – A Treatise*, Ashgate, Farnham *et al.* 2009, p. 136.

22 UNGA Res. 217 A (III), Universal Declaration on Human Rights (10 December 1948).

23 Cf. Cassese, A., *International Law,* 2nd edt., Oxford University Press, Oxford *et al.* 2005, p. 198f.

24 von der Dunk, F./Goh, G. M., *Article V OST*, in Hobe, S./Schmidt-Tedd, B./Schrogl, K.-U. (eds.), Cologne Commentary on Space Law, Vol. I, Heymanns, Cologne 2010, p. 98f., mn. 19f.

the provision. Therefore, the term should be interpreted as solely referring to assistance owed in threatening circumstances.[25]
There were considerations that an obligation of such necessary rescue missions could also include sending help from Earth.[26] However, the wording of the provision leaves a broad margin of interpretation to the assisting State what it will consider to be realizable.[27] Furthermore, in-orbit rescue only became a realistic option with the entry into operation of the space shuttle in 1981[28] and the rise of extravehicular activities (EVA).[29] Even today it is questionable if a rescue mission could be started in time to reach the space travelers in distress, as the necessary stand-by launch capabilities[30] have never been established.
Albeit the wording of Art. V para. 2 OST speaks of astronauts being obliged to render assistance, it refers to the responsibility of States to instruct their astronauts to provide assistance, as individuals cannot be the subject of duties assigned by international treaties.[31] Furthermore, it has always to be kept in mind that Art. V para. 1 OST only demands State Parties of the Treaty to assist other States Parties to the Treaty. Thus, according to the wording of the provision no

25 Cf. von der Dunk, F./Goh, G. M., *Article V OST*, in Hobe, S./Schmidt-Tedd, B./Schrogl, K.-U. (eds.), Cologne Commentary on Space Law, Vol. I, Heymanns, Cologne 2010, p. 98f., mn. 20.

26 Cf. Hall, R. C., *Rescue and Return of Astronauts on Earth and in Outer Space*, 63 Am. J. Int'l L. 197 (1969), p. 204f.; but one has to keep in mind that such duties are generally conditional upon the safety of the persons extending assistance, von der Dunk, F./Goh, G. M., *Article V OST*, in Hobe, S./Schmidt-Tedd, B./Schrogl, K.-U. (eds.), Cologne Commentary on Space Law, Vol. I, Heymanns, Cologne 2010, p. 99, mn. 19.

27 Also including financial and even foreign policy considerations, cf. Hall, R. C., *Comments on Rescue and Return of Astronauts on Earth and in Outer Space*, in: IISL, Proceedings of the Eleventh Colloquium on the Law of Outer Space, 17-18 October 1968 New York (USA), AIAA, 1969, p. 119.

28 The first launch took place on 12 April 1981, cf. <www.nasa.gov/mission_pages/shuttle/shuttlemissions/archives/sts-1.html> (accessed 9 December 2013).

29 Cf. Diederiks-Verschoor, I. H. Ph., *Search and Rescue in Space Law*, in: IISL, Proceedings of the Nineteenth Colloquium on the Law of Outer Space, 12-15 October 1976 Anaheim (USA), AIAA, 1977, p. 153, 155; the first EVA where conducted in the late 1970s cf. e.g. Brown, N. E./Brown, J. W., *Annual Survey of Spaceflight Safety Systems: 1th Supplement*, in: Brown, J. W. (ed.), Space Safety and Rescue 1979-1981, p. 74.

30 Cf. Diederiks-Verschoor, I. H. Ph./ Kopal, V., *An Introduction to Space Law*, 3rd rev. edn., Kluwer Law International, The Netherlands 2008, p. 32.

31 In the opinion of the authors, Art. V (2) OST refers to the responsibility of States to instruct their astronauts to provide assistance, as individuals cannot be the subject of duties assigned by international treaties, cf. Shaw, M., *International Law*, 6th edt., Cambridge University Press, Cambridge 2008, p. 258. Therefore, this question does not fall within the scope of this paper.

assistance is to be rendered to or to be expected by States not being Party to the Treaty, respectively.[32]

Rescue Agreement

The ARRA, as an amplification of the OST, broadened the scope of the existing rescue obligations.[33] The *travaux préparatoire* of the ARRA show that the main concern of the drafting fathers was to ensure the highest possible level of assistance to astronauts in distress and their rescue in the light of humanitarian concerns,[34] or "sentiments of humanity" as phrased by the fourth preambular paragraph of the ARRA. The delegates were opposed to any restrictions of the geographical scope of the duty to render all possible assistance to astronauts in distress. A prominent example for this attitude is the rejection of the first USSR draft, which only referred to landings on the High Seas.[35] This restrictive language was changed to read "on the high seas or any other place not under the jurisdiction of any State" in Art. 3 ARRA.

While Art. 1 ARRA refers to "personnel of a spacecraft" without reference to any geographical limitation, thus also including personnel found in Outer Space, it solely obliges States to inform the launching authority with regard to situations of distress in orbit. Art. 2 ARRA does not only impose an obligation of notification but also of rendering assistance and inducing rescue arrangements under the condition that a spacecraft landed within their jurisdiction, thus the application is limited to their territory. Further amplification is made in Art. 3 ARRA concerning the rescue of and assistance to the personnel of a spacecraft that "have alighted on the high seas or any other place not under the jurisdiction of any State". Although this includes Outer Space, a landing is

32 Cf. Cheng, B., *Studies in Space Law*, Clarendon Press, Oxford 1997, p. 284.

33 Cf. Gorove, S., *Interpreting Salient Provisions of the Agreement on the Rescue of Astronauts, the Return of Astronauts and the Return of Objects Launched into Outer Space*, in: IISL, Proceedings of the Eleventh Colloquium on the Law of Outer Space, 17-18 October 1968 New York (USA), AIAA, 1969, p. 93.

34 Cf. e.g. UN Doc. A/AC.105/C.2/SR.29-37, 24 August 1964, p. 15, Mr. Meeker (USA); ibd., p. 25, Mr. Rae (Canada); ibd., p. 31, Mr. Kleshtov (USSR); ibd., p. 43, Mr. Campora (Argentina); ibd., p. 52, Ms. Gutteridge (UK); ibd., p. 67, Mr. Ambrosini (Italy); ibd., p. 75, Mr. Silos (Brazil); ibd., p. 107, Mr. Krishna Rao (India). The general agreement to regard the rescue of astronauts in distress as a basic humanitarian duty dates back to the start of the drafting of the 1963 Principles Declaration in 1962, cf. e.g. UN Doc. A/AC.105/C.2/SR.1, 21 August 1962, p. 6, Mr. Tunkin (USSR); ibd., p. 8, Mr. Meeker (USA); UN Doc. A/AC.105/C.2/SR.2, 21 August 1962, p. 5, Mr. Calderon Puig (Mexico); UN Doc. A/AC.105/C.2/SR.18, 27 June 1963, p. 6, Mr. Fahmy (United Arab Republic); ibd., p. 10, Mr. Haseganu (Romania). The *travaux préparatoires* of the UN Space Treaties are available via the homepage of the UN Office for Outer Space Affairs at <www.unoosa.org/oosa/en/SpaceLaw/ treatyprep/index.html> (accessed 9 December 2013).

35 Art. 4 of UN Doc. A/AC.105/C.2/L.2, 6 June 1962, in: UN Doc. A/AC.105/6, 9 July 1962, p. 4.

necessary. The duty to return personnel of a spacecraft "found […] in any other place not under the jurisdiction of any State" is established by Art. 4 ARRA, but is distinguished from the question of assistance.[36]
While the OST refers to "astronauts"[37] the ARRA uses the phrase "personnel of a spacecraft".[38] Paying attention to the title and the Preamble of the ARRA which both refer to "astronauts" it could be concluded that the two terms do not differ in their meaning.[39] In contrast, Art. 10 para. 1 MOON, while speaking of "astronauts" and "personnel of a spacecraft", suggests that there could be a difference. The meaning of the notion personnel might on the one hand be read as "encompassing the whole crew of a spacecraft, or even future passengers"[40] and could thus encompass a broader scope.[41] On the other hand, the term could only include such persons having special responsibilities or carrying out specific functions in Outer Space.[42] Thus, while including trained pilots as well as scientists and physicians it could exclude any other passengers.[43] This is supported by the French Version of the Treaty which refers to "l'équipage d'un engine spatial". The ordinary meaning encompasses the "personnel assurant la manœuvre […] d'un vaisseau spatial […] ainsi que, le cas échéant, le

36 Cf. Marboe, I./Neumann, J./Schrogl, K.-U., *Article 4 ARRA*, in Hobe, S./Schmidt-Tedd, B./ Schrogl, K.-U. (eds.), Cologne Commentary on Space Law, Vol. II, Heymanns, Cologne 2013, p. 59, mn. 157.

37 Art. V OST.

38 Arts. 1, 2, 3, 4 ARRA.

39 Cf. Marboe, I./Neumann, J./Schrogl, K.-U., *Article 3 ARRA*, in Hobe, S./ Schmidt-Tedd, B./Schrogl, K.-U. (eds.), Cologne Commentary on Space Law, Vol. II, Heymanns, Cologne 2013, p. 41, mn. 100ff.

40 Dembling, P. G./Arons, D. M., *The Treaty on Rescue and Return of Astronauts and Space Objects*, 9 Wm. & Mary Law Review 630 (1968-1969), p. 643; such a broad approach was advocated by Italy, cf. Note (c) in UN Doc. A/AC.105/C.2/L.21, in: A/AC.105/37, 14 July 1967, Annex I, p. 10.

41 Cf. van Bogaert, E. R. C., *Aspects of Space Law*, Kluwer, Deventer 1986, p. 100; Gorove, S., *Studies in Space Law: Its Challenges and Prospects*, Sijthoff, Leyden 1977, p. 98.

42 Cf. Lyall, F., *Who is an Astronaut? The inadequacy of the current international law*, 66 Acta Astronautica 1613 (2010), p. 1614. It is very clear that "astronauts", as referred to in the OST, are included in this wording. Cf. Abdurrasyid, P., *Certain Views on the Agreement on Rescue of Astronauts, the Return of Astronauts and the Return of Objects launched into Outer Space*, in: Jasentuliyana, N. (ed.), Maintaining Outer Space For Peaceful Uses, The United Nations University, Japan 1984, p. 100. This is supported by the ordinary meaning of the term "personnel" in relation to the work in companies, "personnel" - "people employed in an organization or engaged in an organized undertaking", Oxford Dictionaries – online edition, available at <http://oxforddictionaries.com/> (accessed 9 December 2013).

43 Cf. Gorove, S., *Legal Problems of the Rescue and Return of Astronauts*, 3 Int'l L. 898 (1969), p. 898f.

service des passagers".[44] This interpretation leaves no room for an inclusion of spaceflight participants.[45]
Nevertheless, the rescue obligations of the ARRA must apply analogously to all passengers of the spacecraft,[46] due to the object and purpose of the Treaty, which was driven by humanitarian considerations[47] and the above elaborated principles of general international law.
Art. 3 ARRA is only applicable to spacecrafts which "have alighted". The ordinary meaning of the term "alight" is "to descend, fall, or land" and "to descend and settle; (of something in flight) to land".[48] Thus, an actual landing is required. This is in line with the terms "amerrir" and "atterir" which are used in the French Version of the ARRA. The term "amerrir" means "se poser à la surface de l'eau, en parlant […] d'un vaisseau spatial"[49] while the term "atterrir" is defined as "se poser sur le sol, en parlant […]d'un engin spatial".[50] The same holds true for the Russian term "опуститься"[51] and the Spanish term "descendido".[52]

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44 "Équipage", Larousse Dictionaire – online edition, available at <www.larousse.fr/> (accessed 9 December 2013).

45 This interpretation is also supported by the fact that it was the French delegate Mr. Deleau who took the ARRA to apply only to experimental and scientific flights, UN Doc. A/AC.105/C.2/SR.89, p. 6.

46 Cf. Hobe, S., *Space tourism as a challenge to the astronaut concept*, in: Lafferranderie, G./Marchisio, S. (eds.), The Astronauts and Rescue Agreement – Lessons learned, ESCL, Paris 2011, p. 73f.

47 Cf. e.g. UN Doc. A/AC.105/C.2/SR.29-37, 24 August 1964, p. 15, Mr. Meeker (USA); ibd., p. 25, Mr. Rae (Canada); ibd., p. 31, Mr. Kleshtov (USSR); ibd., p. 43, Mr. Campora (Argentina); ibd., p. 52, Ms. Gutteridge (UK); ibd., p. 67, Mr. Ambrosini (Italy); ibd., p. 75, Mr. Silos (Brazil); ibd., p. 107, Mr. Krishna Rao (India). The general agreement to regard the rescue of astronauts in distress as a basic humanitarian duty dates back to the start of the drafting of the 1963 Principles Declaration in 1962, cf. e.g. UN Doc. A/AC.105/C.2/SR.1, 21 August 1962, p. 6, Mr. Tunkin (USSR); ibd., p. 8, Mr. Meeker (USA); UN Doc. A/AC.105/C.2/SR.2, 21 August 1962, p. 5, Mr. Calderon Puig (Mexico); UN Doc. A/AC.105/C.2/SR.18, 27 June 1963, p. 6, Mr. Fahmy (United Arab Republic); ibd., p. 10, Mr. Haseganu (Romania).

48 "Alight", Oxford English Dictionary – online edition, available at <www.oed.com> (accessed 9 December 2013).

49 "Amerrir", Larousse Dictionaire – online edition, available at <www.larousse.fr/> (accessed 9 December 2013).

50 "Atterir", Larousse Dictionaire – online edition, available at <www.larousse.fr/> (accessed 9 December 2013).

51 Cf. <http://slovari.yandex.ru/%D0%BE% D0%BF%D1%83%D1%81%D1%82% D0%B8%D0%BB%D1%81%D1%8F/ru-en/#lingvo/> (accessed 9 December 2013).

52 "Descender", Pons.eu – The Online Dictionary, Spanish – English, available at <http://en.pons.eu/> (accessed 9 December 2013).

Therefore, a contact with a solid ground or a direct contact to the water surface is demanded which implies that the spaceship has to actually land either on the Earth's surface or a celestial body.[53] Therefore, there is no obligation to give assistance to "an object lost in outer space",[54] hence in-orbit rescue is not included. This interpretation is widely supported by literature.[55]
Thus, there is a considerable discrepancy between the general agreement and goal of the Subcommittee, to draft an all-encompassing regulation further elaborating on Art. V OST[56] and the outcome of its efforts. A look at the Reports of the Legal Subcommittee reveals that this disregard was not paid intentionally. Whereas a lot of possible future space applications where already envisaged and discussed (e.g. mining of extraterrestrial resources, which was finally dealt with in the MOON), the drafters did not discuss in-orbit rescue. Even the scientific discussion after the adoption of the ARRA centered only on procedures with regard to emergency landings on the surface of the Earth.[57] The USA, for example, started studies on space rescue systems already in 1966 after the Gemini 8 incident,[58] but the proposed solutions centered mainly on system redundancy and less on approaches requiring outside help.[59] Furthermore, only

53 Furthermore, the provision raises the question, which is not relevant for this paper, whether intentional landings are also included. For more information see cf. Gorove, S., *Legal Problems of the Rescue and Return of Astronauts*, 3 Int'l L. 898 (1969), p. 899.

54 Abdurrasyid, P., *Certain Views on the Agreement on Rescue of Astronauts, the Return of Astronauts and the Return of Objects launched into Outer Space*, in: Jasentuliyana, N. (ed.), Maintaining Outer Space For Peaceful Uses, The United Nations University, Japan 1984, p. 101.

55 Cf. e.g. Dembling, P. G./Arons, D. M., *The Treaty on Rescue and Return of Astronauts and Space Objects*, 9 Wm. & Mary Law Review 630 (1968-1969), p. 649; Hall, R. C., *Rescue and Return of Astronauts on Earth and in Outer Space*, 63 Am. J. Int'l L. 197 (1969), p. 206; Marboe, I./Neumann, J./Schrogl, K.-U., *Article 3 ARRA*, in Hobe, S./Schmidt-Tedd, B./ Schrogl, K.-U. (eds.), Cologne Commentary on Space Law, Vol. II, Heymanns, Cologne 2013, p. 57, mn. 155; and Sundahl, M. J., *The Duty to Rescue Space Tourists and Return Private Spacecraft*, 35 J. Space L. 163 (2009), p. 169.

56 Cf. Zhukov, G. P., *International co-operation in the Rescue of Astronauts,* in: IISL, Proceedings of the Eleventh Colloquium on the Law of Outer Space, 17-18 October 1968 New York (USA), AIAA, 1969, p. 129.

57 Cf. Diederiks-Verschoor, I. H. Ph., *Search and Rescue in Space Law*, in: IISL, Proceedings of the Nineteenth Colloquium on the Law of Outer Space, 12-15 October 1976 Anaheim (USA), AIAA, 1977, p. 157.

58 Cf. Hall, R. C., *Comments on Rescue and Return of Astronauts on Earth and in Outer Space*, in: IISL, Proceedings of the Eleventh Colloquium on the Law of Outer Space, 17-18 October 1968 New York (USA), AIAA, 1969, p. 109.

59 Cf. Hall, R. C., *Comments on Rescue and Return of Astronauts on Earth and in Outer Space*, in: IISL, Proceedings of the Eleventh Colloquium on the Law of Outer Space, 17-18 October 1968 New York (USA), AIAA, 1969, p. 109.

the USA and USSR had manned space flight programs and conducted tests on possible dockings for space rescue only in 1975,[60] eight years after agreement was reached on Art. 3 ARRA.[61]

It is to be concluded that the ARRA covers an obligation to render assistance in situations of "accident, distress [and] emergency" as far as it concerns terrestrial occurrences[62] but excludes this for extra-terrestrial circumstances as far as no landing is included.[63] This might be due to the fact that the delegates identified analogies to maritime and air law as a model for the obligations towards humans in Outer Space,[64] both of which only concern assistance in search and rescue activities on the surface of the Earth. This could explain the lack of reference to any rescue situations in orbit, which are only covered by Art. V OST because of its more general character. An extension of Art. 3 ARRA by way of analogy to situations of distress in orbit is excluded, as Art. V para. 2 OST covers those situations and no gap which would justify an analogy exists.[65]

Art. 3 ARRA imposes the duty to "extent assistance in search and rescue", if necessary, on such State Parties "which are in a position to do so". The use of the words "search and rescue" indicates that Art. 3 ARRA demands more than assistance concerning tracking of the spacecraft, establishment of communication and monitoring of radio frequencies, as this would clearly fall within the scope of "search", while "rescue" denotes "[t]he act of saving or being saved from danger or distress; the fact of being saved in this way; aid, deliverance."[66] Thus, actions in Outer Space are required if a spacecraft is in a situation of distress in orbit. However, this is limited to actions which a State could reasonably undertake in extending assistance by the phrase being "in a position to do so", which includes a technological and a geographical element.[67]

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60 Cf. <www.nasa.gov/ mission_ pages/apollo-soyuz/astp_mission.html> (accessed 9 December 2013).

61 Cf. Marboe, I./Neumann, J./Schrogl, K.-U., *Article 3 ARRA*, in Hobe, S./Schmidt-Tedd, B./Schrogl, K.-U. (eds.), Cologne Com-mentary on Space Law, Vol. II, Heymanns, Cologne 2013, p. 57, mn. 150.

62 Art. 2 ARRA.

63 Art. 3 ARRA; cf. Hall, R. C., *Rescue and Return of Astronauts on Earth and in Outer Space*, 63 Am. J. Int'l L. 197 (1969), p. 205f.

64 Cf. UN Doc. A/AC.105/C.2/SR.2, 21 August 1962, p. 2, Mr. Ambrosini (Italy); A/AC.98/2, p. 4.

65 Concerning such a gap being the precondition for an analogy to be possibly established cf. e.g. Cheng, B., *Analogies and Fictions in Air and Space Law*, 5 Annals of the Chinese Society of International Law 20 (1986), p. 21; Vöneky, Silja, *Analogy in International Law*, in: The Max Planck Encyclopaedia of Public International Law – online edition, available at <www.mpepil.com> (accessed 9 December 2013).

66 "Rescue", Oxford English Dictionary – online edition, available at <www.oed.com/> (accessed 9 December 2013).

67 Cf. Dembling, P. G./Arons, D. M., *The Treaty on Rescue and Return of Astronauts and Space Objects*, 9 Wm. & Mary Law Review 630 (1968-1969), p. 651.

The obligation does not entail endangering own lives or even interrupting an own essential operation to conduct a rescue mission.[68] Keeping this in mind it is to be concluded that a mission neither being financially nor technically feasible or the place of rescue being out of reasonable reach puts a State "not in a position" to extent assistance and does therefore not impose the obligation on that State.

Concerning the means of assistance, the drafting history shows that it was intended to apply an all-encompassing approach.[69] This is illustrated by the fact that the USSR suggested including a non-exhaustive list of technologies and devices which were to be used in rescue missions.[70] This did not prevail because of its too restrictive character. It was considered more prudent not to include reference to current technology in order to allow for an interpretation taking into account state-of-the-art devices every time the Agreement was applied.[71] Argentina, Lebanon and Mexico expressly stated in a draft proposal that each Contracting Party "shall employ every means at its disposal including the most developed and effective means available to it by technology and those to be developed in the future."[72]

While State Parties have to extend assistance to all spacecraft, also of non-State Parties, the question whether other States not Party to the Treaty would also be obliged to conduct rescue missions to astronauts in Outer Space is of a rather theoretical nature. Their technical capabilities will probably be insufficiently advanced, as all major space-faring nations have signed and ratified the ARRA.[73]

Comparison

It is to be noted, that OST and ARRA do not use the term "astronaut"[74] consistently but the provisions of ARRA refer to "personnel of a spacecraft".[75] However, as shown above, the obligation to rescue arising from Art. V para. 2 OST and from Art. 3 ARRA has to be interpreted within the light of the object and purpose of the Treaty under consideration of general international law. Thus,

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68 Cf. Dembling, P. G./Arons, D. M., *The Treaty on Rescue and Return of Astronauts and Space Objects*, 9 Wm. & Mary Law Review 630 (1968-1969), p. 651; Lyall, F./Larsen, P. B., *Space Law – A Treatise*, Ashgate, Farnham *et al.* 2009, p. 139; neither is this demanded by Art. V OST, cf. von der Dunk, F./Goh, G. M., *Article V OST*, in Hobe, S./Schmidt-Tedd, B./Schrogl, K.-U. (eds.), Cologne Commentary on Space Law, Vol. I, Heymanns, Cologne 2010, p. 99, mn. 19.

69 Cf. e.g. WG.I/30, in: A/AC.105/21, Art. 1.

70 Cf. Art. 1 (1) of UN Doc. A/AC.105/ C.2/L.2/Rev.2, in: UN Doc. A/AC.105/21, 23 October 1964, Annex I, p. 2.

71 Cf. UN Doc. A/AC.105/C.2/SR.42, 30 November 1965, p. 8, Mr. Deleau (France); ibd. Mr. Litvine (Belgium); and ibd., p. 11, Mr. de Medicis (Brazil).

72 UN Doc. WG.I/36, in: A/AC.105/29, 1 October 1965, Annex I, p. 5.

73 Cf. UN Doc. A/AC.105/C.2/2013/CRP.5, 28 March 2013.

74 Cf. Art. V OST, as well as title and preamble of ARRA.

75 Cf. Art. 1, 2, 3 and 4 ARRA.

the above mentioned obligations to rescue cannot be interpreted narrowly and have to encompass (at least) by analogy private flight participants, e.g. space tourists.[76]
Furthermore, it is to be noted that the difference of the wording, Art. V OST demanding "all possible assistance" while Art. 3 ARRA obliges only States which are "in a position to do so", sets up different measures for States. Although in the end the degree of assistance demanded of one State will always depend on the available practical and technical potentials of the State rendering assistance.[77]
Art. V para. 2 OST includes assistance "from one spacecraft to another spacecraft in outer space",[78] while Art. 3 ARRA demands that State Parties to the Treaty "shall extend assistance in search and rescue operations" solely when the spacecraft has landed. Thus, an obligation to intervene and to render assistance to astronauts and persons while traveling in Outer Space, *ergo*, an obligation to conduct rescue missions concerning situations where the spaceship is lost in orbit, can solely be derived from Art. V para. 2 OST.
An improvement being achieved by the ARRA is the modification that in contrast to Art. V OST where solely State Parties of the Treaty are obliged to render each other assistance, Art. 3 ARRA does not require the State being in a situation of distress to be Party to the Treaty.

Relationship

As shown above there are quite some important differences between the provisions of the OST and the ARRA. It seems bizarre that the Treaty further elaborating on the matter of rescue of astronauts, the ARRA, lacks so many details and requirements established by the more general Treaty, the OST.
This raises the question concerning the relationship between the OST and the ARRA. Does one of them enjoy precedence? Has the ARRA to be regarded as *lex specialis*? As the Preamble and the drafting history show, the ARRA was meant to further elaborate on Art. V OST. Although both are independent international agreements, the two treaties are closely tied and have to be

76 Cf. Dembling, P. G./Arons, D. M., *The Treaty on Rescue and Return of Astronauts and Space Objects*, 9 Wm. & Mary Law Review 630 (1968-1969), p. 643; Marboe, I./Neumann, J./Schrogl, K.-U., *Article 3 ARRA*, in Hobe, S./Schmidt-Tedd, B./Schrogl, K.-U. (eds.), Cologne Commentary on Space Law, Vol. II, Heymanns, Cologne 2013, p. 35, mn. 86; and von der Dunk, F./ Goh, G. M., *Article V OST*, in Hobe, S./ Schmidt-Tedd, B./Schrogl, K.-U. (eds.), Cologne Commentary on Space Law, Vol. I, Heymanns, Cologne 2010, p. 96ff., mn. 7-1.

77 Cf. Hall, R. C., *Comments on Rescue and Return of Astronauts on Earth and in Outer Space*, in: IISL, Proceedings of the Eleventh Colloquium on the Law of Outer Space, 17-18 October 1968 New York (USA), AIAA, 1969, p. 119; and, Marboe, I./ Neumann, J./ Schrogl, K.-U., *Article 3 ARRA*, in Hobe, S./ Schmidt-Tedd, B./Schrogl, K.-U. (eds.), Cologne Commentary on Space Law, Vol. II, Heymanns, Cologne 2013, p. 57, mn. 154.

78 Cheng, B., *Studies in Space Law*, Clarendon Press, Oxford 1997, p. 284.

regarded in the light of each other.[79] Thus, the enhanced provisions are not meant to exclude, but rather to complement each other. Furthermore, there is no "incompatibility" of the above mentioned provisions. Treaties are "incompatible" if the obligation owed by one treaty cannot be complied with without breaching the other.[80] Concluding, the ARRA and the OST are applicable in parallel. Thereby, the *lacuna* of the ARRA[81] regarding in-orbit rescue missions is addressed by the OST.

III. Conclusion

The analysis of the relevant norms shows that as long as the rescue of humans is concerned, States are traditionally willing to accept far-reaching obligations. This is the rationale behind Art. V OST with its, even though unspecific, general obligation to provide assistance. It is true that the ARRA suffers from shortcomings, although it was intended to be in line with this tradition and to broaden the scope of Art. V OST.

Art. V OST and the ARRA are ambiguous concerning the terms "astronaut" and "personnel of a spacecraft", neither of which is defined; Art. V OST leaves a broad margin of interpretation of "all possible assistance"; and in-orbit rescue is not addressed in the ARRA. As the wording always constitutes the limits of interpretation, Art. 3 ARRA cannot be interpreted to include situations were a spacecraft has not alighted. As shown above, it is not possible to apply the provision analogously.

Essentially, a duty to provide assistance to humans in orbit, whether they are there for professional, scientific or commercial reasons, or as tourists, was regarded to be undisputed even before the above discussed provisions were drafted. Its missing codification does not affect its existence. Certainly, a clearly codified duty to assist and rescue humans experiencing situations of distress in orbit is desirable, as it would provide legal certainty and preclude disputes over the status of individuals involved. So far, attempts to revise the ARRA have not been successful, but should be considered in the near future, especially with

79 Cf. Zhukov, G. P., *International cooperation in the Rescue of Astronauts,* in: IISL, Proceedings of the Eleventh Colloquium on the Law of Outer Space, 17-18 October 1968 New York (USA), AIAA, 1969, p. 125f.

80 Cf. Odendahl, K., *Article 30*, in: Dörr, O./ Schmalenbach, K. (eds.), Vienna Convention on the Law of Treaties – A Commentary, Springer, Berlin *et al.* 2012, p. 510f., mn. 13.

81 Hall, R. C., *Comments on Rescue and Return of Astronauts on Earth and in Outer Space*, in: IISL, Proceeding of the Eleventh Colloquium on the Law of Outer Space, 17-18 October 1968 New York (USA), AIAA, 1969, p. 115; Matte, N. M., *Safety and Rescue – Introduction*, in: Böckstiegel, K.-H. (ed.), Manned Space Flight – Legal Aspects in the Light of Scientific and Technical Development, Heymanns, Cologne 1993, p. 146; Diederiks-Verschoor, I. H. Ph./ Kopal, V., *An Introduction to Space Law*, 3rd rev. edn., Kluwer Law International, The Netherlands 2008, p. 34.

regard to the recent developments and increasing investments concerning space tourism. Although there is a low probability of sub-orbital flights leading to situations of distress in orbit, the necessity of further regulation is underlined by elements of commercial space habitats already orbiting the Earth.
While the authors would prefer a codification of the duty to rescue persons in orbit, it might be easier to achieve agreement in the UNGA on a resolution of principles concerning space rescue as a first step. Especially regarding the fact that the MOON was the last space Treaty adopted, solely followed by UNGA resolutions, a resolution might meanwhile prove to be the most convenient way towards the acceptance of a universal interpretation of Art. V para. 2 OST.
Nevertheless, it should be the far aim to amend the ARRA or to adopt a new Treaty concerning rescue in space. Those new provisions shall include:

- A clarification of the terms "astronaut" and "personnel of spacecraft" towards a universal concept encompassing all space travelers;
- An explicit obligation to extend assistance concerning in-orbit rescue;
- Regulations on international cooperation in discharging the newly established obligation; and
- The establishment of a fund or a similar instrument to finance in-orbit rescue.