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SPACE

TRYING TO FIT A SQUARE PEG INTO A ROUND HOLE? APPLYING AIR LAW TO MANNED COMMERCIAL SPACEFLIGHT—THE CASE STUDY OF CURACAO

Frans G. von der Dunk*

INTRODUCTION

The first properly private and commercial manned spaceflights, though considerably delayed since the X-Prize was won in October 2004, now seem right around the corner. Virgin Galactic, still likely to be the first to market, is – at the moment of this writing – aiming for 2014 for its first passengers to be flown by its SpaceShipTwo, from underneath the wings of its carrier aircraft WhiteKnightTwo, to an altitude of some 120 km.[1] Space Expedition Corporation (SXC) may soon follow as the second to market, with its single-stage XCOR-manufactured Lynx planned to achieve similar altitudes as of 2014, possibly from its home base in Curacao.[2] Several further projects planning for similar flights from a variety of places in Europe, the Middle East and East Asia are momentarily discussed as well.

The novelty of this endeavour has, naturally, led lawyers to discuss – and sometimes considerable diverge in opinion – as to how to best regulate it, internationally and nationally, in particular with a view to using existing regimes of air law and space law .[3]

The arguments put forward in favour of using air law, at least as a starting point in order not to completely reinvent the wheel, usually amount to pointing out that the vehicles so far being planned or developed for sub-orbital spaceflight generally would, could or at least should qualify as aircraft.[4] Their flight profiles certainly take them 'above' air space into the margins of outer space for only a brief part of their trip, without such flights seemingly having much to do with 'classical' space activities such as science or satellite operations. Finally, aviation has a longstanding tradition of regulating private commercial flights in particular as to their safety-aspects through an elaborate and well-weathered system of national and regional regulation within a harmonising international legal framework.[5] It thereby also handles such issues as certification of aircraft, licensing of crews and rules for the operation of aircraft and airports alike.

And indeed, the International Civil Aviation Organisation (ICAO)[6] has already a number of years ago for the first time seriously addressed the issue of whether it should not act as the proper body to regulate commercial sub-orbital flight – although at the same time it should be noted that the outcome of that 'investigation' was that, yes, sub-orbital vehicles would fall within the generic definition of aircraft as ruling in international aviation ("any machine that can derive support in the atmosphere from the reactions of the air other than the reactions of the air against the earth's surface"[7]), but no, at the time it did not seem opportune or appropriate for ICAO to actually start regulating such flights[8].

Also the European Aviation Safety Agency (EASA), established by the European Union to handle many safety aspects of aviation within the EU Internal Market[9], tinkered with the idea to develop a specific subset of regulations for sub-orbital vehicles using existing aircraft certification as the point of departure[10], although this approach now

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seems to have been shelved.
In the latter context indeed some attention has been given to what it means to actually start applying, or trying to apply, those rules to manned spaceflight. Safety regulation in aviation, however, in terms of implementation and enforcement is very much a national process, even in the case of Europe only partially elevated to the regional level. At the same time, it is guided and framed by the international legal framework developed in the context of the Chicago Convention and its Annexes[11], as well as the competence of ICAO as established by the Chicago Convention to further address issues of safety at least in the international context[12].

1. INTERNATIONAL REGULATION OF THE SAFETY OF AVIATION

It is fundamentally through the concept of 'aircraft' referred to before that the safety of aviation is regulated at the international level.
To start with, the registration of an aircraft with a particular state, in accordance with Article 17 of the Chicago Convention, provides the aircraft with the nationality of that state, entitling it to exercise its jurisdiction on a quasi-territorial basis on board – inter alia with regard to safety regulation. This entitlement at the same time comes to represent an obligation to implement safety regulations vis-à-vis that aircraft as agreed upon at the international level.
This refers for example to general requirements already imposed under the Chicago Convention itself, such as mandatory documentation related to safety that has to be available on board or the mandatory presence of radio equipment on board.[13] More importantly still are the requirements pertaining to an airworthiness certificate before flying a particular aircraft is allowed.[14] Similarly, crews should be properly licensed for their respective responsibilities and tasks.[15] Article 33 then requires mutual recognition of airworthiness certificates and crew licenses as between ICAO member states.
All further details of these safety-related requirements are to be found in the various Annexes to the Chicago Convention, which are regularly updated so as to keep track of important technological or operational developments. Amongst the 18 Annexes, the following seven incorporate the technical requirements most directly related to the safety of aviation, usually targeted at aircraft defined as referred to above: Rules of the Air (Annex 2), Operation of Aircraft (Annex 6), Airworthiness of Aircraft (Annex 8), Aeronautical Telecommunications (Annex 10); Air Traffic Services (Annex 11), Aircraft Accident and Incident Investigation (Annex 13) and the Safe Transport of Dangerous Goods by Air (Annex 18).
Whilst strictly speaking not belonging to the realm of safety-related legislation and regulation, it may be noted that also the liability for damage caused by aviation is attached to aircraft, and through those to the operators of those aircraft.[16] Similarly, the application of criminal air law is channelled through the concept of 'aircraft', being viewed as a quasi-territorial extension of the state of registration for the purpose of criminal jurisdiction.[17]

2. 'NATIONAL' IMPLEMENTATION IN THE CASE OF CURACAO: ISSUES OF APPLICABILITY

Though from an international perspective Curacao, even after the October 2010-establishment of autonomy, remains a 'Land' within the Kingdom of the Netherlands as the internationally-relevant legal entity, it has the opportunity in many contexts to deviate from national Dutch legislation otherwise generally applicable throughout the Kingdom. Aviation constitutes a prime example thereof; while the recent change of

status of Curacao may yet give rise to a reappraisal of existing legislation, so far the applicable regime essentially derives from the Aviation Ordinance (‘*Luchtvaartlandsverordening*’) of 20 December 2001[18], further elaborated by way of such regulations as the Decree on aviation supervision (‘*Landsbesluit toezicht luchtvaart*’) of 2003[19], the Decree on regulated and non-regulated air transport (‘*Landsbesluit geregeld en ongeregeld luchtvervoer*’) of 2005[20], and the Decree on air traffic (‘*Landsbesluit luchtverkeer 2005*’) of 2006[21].

Generally speaking, also Curacao’s legislation on aviation principally hinges on the involvement of ‘aircraft’, which is defined here as “vehicles which can operate in the atmosphere with the help of the upward lift provided by the air”, although certain vehicles, which would otherwise fall within this definition, may specifically be exempted therefrom.[22]

From the perspective of sub-orbital flight, most prototypes currently being developed indeed *can* so operate, at least for the lower parts of their trajectories, in airspace, and this includes XCOR’s Lynx vehicle in particular – even if it *would* not *actually* on a (ny) particular flight operate with the help of the upward lift provided by the air, it would *in principle* still qualify as such.

Only military aircraft fundamentally fall outside the scope of the general regime on commercial and general aviation as otherwise applied to aircraft[23] — but obviously this is not a clause that would as such allow the craft to be used for sub-orbital spaceflights to escape applicability thereof. Also, of course, the Chicago Convention itself does not apply to military aircraft.[24]

Qualification as an ‘aircraft’ for Curacao’s regulatory purposes as per the above consequently under public international law would in principle bring with it, firstly, the detailed obligations concerning the airworthiness certificates each aircraft is required to carry.[25] Secondly, such craft would have to comply with the regulations pertaining to mandatory equipment on board.[26] Thirdly, they would have to be registered and marked in accordance with applicable aircraft regulations.[27]

It should be noted, that as to commercial air transport conducted with aircraft, flights such as envisaged by SXC could also fall under the definition of the former as per the Chicago Convention, as this refers to any “carriage of persons, cargo or mail for remuneration or hire”, made applicable also to Curacao by the local regulations.[28]

At the same time, the Chicago Convention is focused on point-to-point transportation, more precisely point-A-to-point-B transportation, which is so much deemed to be self-evident that it is not expressly referenced as such.[29] The sub-orbital hops currently envisaged by the likes of Virgin Galactic and SXC, however, are best qualified from this perspective as point-A-to-point-A flights, which normally would not be considered ‘transportation’ yet are strictly speaking still point-to-point – as every flight by definition is point-to-point.

Indeed, the applicable regulations in Curacao further distinguish between ‘regulated air transport’, being “a series of traffic flights, accessible to the public, *between two or more places*” in a frequent and scheduled manner[30] (to which sub-orbital hops, landing where they take off, do not belong), and ‘non-regulated air transport’, being defined as all other flights[31] (which should then *ipso facto* include sub-orbital hops).

In other words, any presumed equivalence of the legal concepts of ‘transport(ation)’ and ‘flight’ turns out not to work any longer in the context of sub-orbital flights, giving rise to potential confusion. Most of the Curacao regulation would namely remain applicable to the latter category as well, provided of course that the craft to be used for sub-orbital flights would be qualified as aircraft.

The only sub-category of non-regulated air transport further defined is that of a ‘flight tour’, defined as a flight starting and finishing at the same location and taking a total time of no more than 60 minutes.[32] As the XCOR Lynx to be used by SXC, would

have a flight profile of some 30 minutes only, it would indeed fit within this category.[33]

For all commercial air transport activities – whether SXC's Lynx flights would be qualified as 'flight tours' or not – an Air Operator Certificate (AOC) would be required.[34] The AOC will include amongst others a description of the activities allowed and the type(s) of aircraft allowed to undertake them with, the areas where these activities would be allowed and other special authorizations and conditions imposed by the responsible authorities.[35]

The requirements for obtaining an AOC also in Curacao are elaborated in quite some detail. Firstly, a series of demonstration flights has to be successfully completed before an AOC will be granted.[36] Then, Section 9.3 of the Civil Aviation Regulations of the Netherlands Antilles requires the existence of an Operations Manual, a training programme, an Aircraft Operating Manual, a set of 'Required Cabin Attendants' (noting that the Lynx is supposed to fly with one pilot and one passenger only!) and pilot training, as well as a host of technical conditions. Section 9.4 next provides a series of requirements related to maintenance, whereas Section 9.5 similarly includes requirements addressing threats of illegal interference with flights.

In principle, two categories of flight would be exempted from the general application of the above regime to commercial flights, whether regulated or unregulated.

One of those concerns so-called 'aerial work', which includes – but is not restricted to – flights for special services such as agriculture, construction, photography, surveying, search and rescue and aerial advertising.[37] As the list is not exhaustive, it would in principle be possible to explicitly include sub-orbital flights in this concept as well. For such flights a special authorization can be provided for up to three years, and be possibly made subject to further conditions or restrictions. [38]

The other concerns 'general aviation operations'[39], of which 'aerobatic flights' may constitute a special sub-category relevant here. Such a flight is defined as "a flight where on purpose movements are executed which result in a sudden change in the attitude, an abnormal attitude or an abnormal change in the velocity of the aircraft".[40] The sub-orbital flights envisaged by SXC would seem to at least potentially fit in with that definition.

For such aerobatic flights a specific exemption is required[41]; whereas such activities also are banned from the airspace above a city or other town, above a public open air meeting, within aviation zones adjacent to an airport, at lower than 450 m altitude or if visibility is less than 3 miles (4.8 km) – rules clearly not drafted for sub-orbital flights soaring to altitudes of over a 100 km, nevertheless potentially relevant and applicable.[42] Finally, in certain cases all passengers should be equipped with their own parachute[43] which obviously would not seem very helpful for the major part of sub-orbital flights soaring to altitudes of over a 100 km – and hence, presumably, not very appropriate.

Yet another special regime is applicable to test flights, defined as "flights that are executed to test the capabilities and proper operation of an aircraft, or to prove compliance with airworthiness requirements".[44] Such flights will be exempted from at least a number of requirements otherwise applicable; any test flights of the Lynx – so excluding those with paying passengers on board – would then qualify as such.

Then, the Aviation Ordinance allows for the designation by the authorities of certain flights as 'special activities', for which an authorization for up to five years could be granted.[45] Such an authorization will indicate "which activities the holder of the authorization is authorized to undertaken and with which aircraft it will be undertaken".[46]

General requirements related to the grant of an authorization will continue to apply also in this context. This concerns for example requirements regarding the transport

of dangerous goods (noting that SXC is also soliciting customers interested in hoisting scientific payloads into the lower margins of outer space), prohibited operations and the use of designated airport facilities.[47]
Finally, the regulations in general address 'local flights', encompassing each "flight remaining within the confinement of the island territory" of Curacao.[48] Apart from the possibility of flight paths extending to areas over the high seas close to Curacao, this raises a particularly interesting point with respect to space law.
As indicated, the highest segment of the arched trajectory of Lynx flights will – at least as intended – be above an altitude of 100 km, which of course conjures up the issue of whether a legal boundary line between airspace and outer space is acknowledged at such an altitude. To the extent such a flight segment therefore should legally be considered to take place in outer space – and there are some arguments for concluding that generally an understanding is developing that this is, indeed, with reference to exceeding an altitude of 100 km[49] – this would disallow the applicability of such a definition.
On the other hand, this definition is not yet universally accepted, whereas the phrasing of the particular clause in the Civil Aviation Regulations of the Netherlands Antilles might leave some wriggle room for a different interpretation as well – if the reference to the 'confinement of the island territory' is read as a referring to a two-dimensional confinement of territory regardless of the altitude, instead of to a three-dimensionally confined space.
In line with such an interpretation, the reason for this geographical limitation of 'local flights' refers to the possible complications resulting from flights entering another state's airspace, in view of responsibilities and competencies to provide air traffic services. In other words, as long as Curacao air traffic services would clearly be responsible, competent and in control, one could argue that also sub-orbital flights extending out over the high seas and/or into the lower realms of outer space could be encompassed by the concept without further ado.
The main benefit from a regulatory perspective would be that such an interpretation allows the Curacao aviation authorities to treat sub-orbital flights as a completely internal matter, allowing them to leave much international safety regulation, which might represent an ill or unduly complicating match for the characteristics of sub-orbital flight, out of the equation – at least as long as no airlines or other aircraft operators from outside of Curacao would be impacted by such a lack of applicability of international rules, standards and recommended practices.

3. 'NATIONAL' IMPLEMENTATION IN THE CASE OF CURACAO: ISSUES OF SUBSTANCE

Further to the above analysis of the extent to which sub-orbital flights like those planned by SXC and XCOR would, could or should fall within the scope of the general regime applicable in Curacao to entities undertaking aviation and aviation-related activities, the present paragraph presents an effort to shed some light on what such subjugation to this regime would mean in terms of its substance.
Firstly, as indicated above a certificate of airworthiness is required in accordance with the Civil Aviation Regulations of the Netherlands Antilles (which so far continue to apply to Curacao also after disbanding the Netherlands Antilles as an administrative entity).[50] In terms of substance then a special Decision on airworthiness of aircraft ('*Beschikking luchtwaardigheid van luchtvaartuigen*') of 2008[51] further provided for all the requirements related to airworthiness that aircraft have to comply with. These obligations principally apply to the registered owner or leaseholder of an aircraft registered in the Netherlands Antilles or his agent.[52]

Interestingly, with a view to the intended use of the Lynx vehicle by SXC, the Decree on aviation supervision creates a special regime for aircraft manufactured in the United States. Such aircraft will be semi-automatically provided with airworthiness certificate, "if the aircraft (a) is manufactured in conformity with applicable laws and regulations of the United States, (b) complies with all special requirements that, on the date of the request for an airworthiness certificate were applicable, (c) are provided with an certificate of airworthiness for export, granted not earlier than 60 days before the date of entry into force of the airworthiness certificate, and (d) complies with the regulations of the Netherlands Antilles [read now: Curacao] concerning the execution of flights".[53]

Part 5 of the Civil Aviation Regulations of the Netherlands Antilles distinguishes between a 'type evaluation' for the purpose of obtaining an airworthiness certificate, in case the aircraft type for which an airworthiness certificate is requested has not been certified by the Netherlands Antilles (read now Curacao) before, and a 'series evaluation' which applies where that by contrast has been the case.[54] Airworthiness certificates would then be tailor-made for a range of possible aircraft, of which 'utility aircraft', 'aerobatic aircraft', 'light aircraft' and 'special aircraft', including experimental aircraft, would come closest to being applicable and/or useful for SXC operations.[55]

In addition, Part 5 of the Civil Aviation Regulations of the Netherlands Antilles provides for the possibility to grant special certificates of airworthiness in case the aircraft concerned does not qualify for a standard certificate.[56] In such cases, only those safety- and certification-requirements will be imposed which such aircraft could reasonably comply with.

However, such special certificates can only be granted to aircraft exclusively flying 'within' Curacao and are not being used for international flights; which brings to mind the earlier discussion on 'local flights' and the boundary question – as well as whether a 'local flight' is not presumed to address point-A-to-point-B flights after all.

Part 8 of the Civil Aviation Regulations of the Netherlands Antilles lays down the specific requirements applying to certificates of airworthiness, such as mandatory documentation, maintenance, crew requirements, crew tasks, aircraft operating and performance limitations and protection against unacceptable interference with the flight.[57] A specific chapter moreover is devoted to aircraft carrying passengers, providing requirements for passenger seats, the briefing of passengers, emergency kits, refusal of passengers, transport of 'special situation passengers' and passengers with reduced mobility and evacuation options.[58]

Other elements of the regime applicable to aircraft concern the flight rules applicable to Curacao airspace, operations in controlled flight-mode, VFR-flights and IFR-flights[59], the various categories of controlled and uncontrolled airspace and the respective role of air traffic control[60], and crew and passengers[61].

Of specific interest for SXC operations is for example the requirement that only for aircraft of more than 4700 kg at least two pilots are required[62]; the Lynx *does* not fall within the scope of that requirement. On the other hand, the principled prohibition to fly passengers who represent a danger to their environment or dangerous substances (with a view to SXC's options to bring small scientific payloads into lower space) would apply to Lynx flights.

Finally, previously already reference has been made to such consequences of application of air law and relevant Curacao regulations as the requirement of cabin attendants and parachutes, as some of the most straightforward examples of where such application may lead to results that are either impracticable or absurd. More broadly, this should give rise to the conclusion that such application at the outset creates more problems than it solves, in particular where there is currently so little

actual sub-orbital flights carrying passengers and the intention would be to only put reasonable requirements in the path of these incumbent enterprises.

4. CONCLUDING REMARKS

In appraising the above overview of applicable legislation and regulation to various types of flights using various types of aircraft in Curacao, it will become clear that it will not be easy to apply this regime without – much – further ado to sub-orbital flights. While perhaps on individual aspects certain definitions used may *prima facie* relatively easily apply or be made to apply, the extended details of almost all of those regimes at some point or other would likely go astray of what would make sense with respect to sub-orbital flights.

It is not accidental therefore, that the FAA has chosen to start from the other end, not trying to apply existing regulation for aircraft and aviation and then tweak it across the board to fit the specifics of sub-orbital flight, but rather start 'from scratch', and develop a *sui generis* regime which actually fits this novel activity. In the course of doing so, its huge experience with licensing and certification in the aviation sector will then certainly come in handy, but the principled approach is to work with the industry as long as neither have a real clue as to what might consistently go wrong.

Of course, in addition to a Congressional mandate to protect by way of regulation the public interests in private manned spaceflight (safety, security, protection of the environment and suchlike), the FAA also has a mandate to support an infant industry – a second mandate European aviation regulatory authorities usually do not have. And while this may apply by proxy to Curacao as well, as a part of the Kingdom of the Netherlands, the Curacao authorities indeed seem to be aware that it is also in the public interest to see such an infant industry take off on their island – and that they should at least avoid to blindly try to fit the square peg of aviation regulation into the round hole of sub-orbital spaceflight – or was it the other way around?

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[1] See http://www.virgingalactic.com

[2] See http://www.spacexc.com/en/home/

[3] The present author, from this respect, has repeatedly argued for an approach taking space law as the point of departure; cf. e.g. Space tourism, private spaceflight and the Law: Key aspects, *27 Space Policy* (2011), 146-52; also The integrated approach – Regulating private human spaceflight as space activity, aircraft operation, and high-risk adventure tourism, *92 Acta Astronautica* (2013), esp. 199-200 & literature referenced in fn. 1, 2.

[4] Current approaches range from single-stage-to-space craft (such as XCOR's Lynx) through two-stage-to-space vehicles with a carrier aircraft air launching the spacecraft properly speaking (as with Virgin Galactic) to vertical take-off and landing concepts (such as Blue Origin's New Shepard; see http://www.blueorigin.com); obviously the definition of 'aircraft' (see further *infra*, at n. 7) would apply to quite different degrees to these concepts.

[5] It should be noted that, whilst the current focus of the various spaceflight projects referred to is on short sub-orbital hops, returning to the same site where take-off took place, in the future also commercial flights between various terrestrial destinations are envisaged, effectively amounting to international air transportation making use of sub-orbital space for the major portions of the flights.

[6] ICAO was established by the Convention on International Civil Aviation (hereafter Chicago Convention; Chicago, done 7 December 1944, entered into force 4 April 1947; 15 UNTS 296; TIAS 1591; 61 Stat. 1180; Cmd. 6614; UKTS 1953 No. 8; ATS 1957 No. 5; ICAO Doc. 7300) in particular to develop an international regime for the safety of aviation, and has since developed many Standards and Recommended Practices to implement that mandate. See e.g. R.S. Jakhu & Y.O.M. Nyampong, International regulation of emerging modes of space transportation, in J.N. Pelton & R.S. Jakhu (Eds.), Space Safety Regulations and Standards (2010), 215-38.

[7] E.g. Annex 7 to the Chicago Convention, *Aircraft Nationality and Registration Marks*, 5th edition, July 2003, Definitions; Annex 8, *Airworthiness of aircraft*, 10th edition, April 2005, Definitions.

[8] See Working Paper on Concept of Suborbital Flights, ICAO Council, 175th Session, 30 May 2005, C-WP/12436

further e.g. P. van Fenema, Suborbital Flights and ICAO, 30 *Air & Space Law* (2005), 396-411.
[9] As per Regulation of the European Parliament and of the Council on common rules in the field of civil aviation and establishing a European Aviation Safety Agency, No. 1592/2002/EC, of 15 July 2002; OJ L 240/1 (2002); later replaced by Regulation of the European Parliament and of the Council on common rules in the field of civil aviation and establishing a European Aviation Safety Agency, and repealing Council Directive 91/670/EEC, Regulation (EC) No 1592/2002 and Directive 2004/36/EC, No. 216/2008/EC, of 20 February 2008; OJ L 79/1 (2008).
[10] See e.g. J.B. Marciacq et al.,), Accommodating sub-orbital flights into the EASA regulatory system, in J.N. Pelton & R.S. Jakhu (Eds.), *Space Safety Regulations and Standards* (2010), 187-212; also S. Hobe & J. Cloppenburg, Towards a New Aerospace Convention? Selected Legal Issues of "Space Tourism", in *Proceedings of the Forty-Seventh Colloquium on the Law of Outer Space* (2005), 379.
[11] Further to Artt. 37-38, Chicago Convention.
[12] Cf. Artt. 43-66, Chicago Convention.
[13] See Artt. 29 resp. 30, Chicago Convention.
[14] See Art. 31, Chicago Convention.
[15] Cf. Art. 32, Chicago Convention.
[16] Cf. e.g. Art. 1(1), Convention for the Unification of Certain Rules Relating to International Transportation by Air, Warsaw, done 12 October 1929, entered into force 13 February 1933; 137 LNTS 11; USTS 876; UKTS 1933 No. 11; ATS 1963 No. 18; Art. 1(1), Convention for the Unification of Certain Rules for International Carriage by Air, Montreal, done 28 May 1999, entered into force 4 November 2003; 2242 UNTS 350; ICAO Doc. 9740; 48 *Zeitschrift für Luft- und Weltraumrecht 326 (*1999); and Art. 1(1), Rome Convention on Damage Caused by Foreign Aircraft to Third Parties on the Surface, Rome, done 7 October 1952, entered into force 4 February 1958; 310 UNTS 181; ATS 1959 No. 1; ICAO Doc. 7364.
[17] Cf. e.g. Art. 1, Convention on Offences and Certain Other Acts Committed on Board Aircraft, Tokyo, done 14 September 1963, entered into force 4 December 1969; 704 UNTS 219; UKTS 1969 No. 126; Cmnd. 2261; ATS 1970 No. 14; 2 ILM 1042 (1963); ICAO Doc. 8364.
[18] *Landsverordening van de 20ste december 2001 houdende nieuwe regels omtrent de luchtvaart*; P.B. 2001, no. 151.
[19] *Landsbesluit houdende algemene maatregelen van de 24e april 2003, ter uitvoering van de artikelen 2, tweede lid, onderdeel a, 5, eerste en tweede lid, 7, tweede tot en met vijfde lid, 10, eerste en tweede lid, 37, tweede lid, onderdeel a, 50, vierde lid, 66, eerste lid, onderdelen a en b, en 68 van de Luchtvaartlandsverordening;* P.B. 2003, no. 56.
[20] *Landsbesluit, houdende algemene maatregelen, van de 15e februari 2005 ter uitvoering van artikel 8, vierde lid, van de Luchtvaartlandsverordening*; P.B. 2005, no. 37.
[21] *Landsbesluit, houdende algemene maatregelen, van de 21e januari 2006 ter uitvoering van artikel 22, eerste lid, van de Luchtvaartlandsverordening*; P.B. 2006, no. 11.
[22] Art. 1(b), Aviation Ordinance. It may be noted of course that this definition is almost identical to the one provided by, e.g., Annexes 7 and 8 to the Chicago Convention for purposes of international air law.
[23] See Artt. 2, 112 ff., 126-128, Decree on aviation supervision; Art. 1(q), (v), Aviation Ordinance.
[24] See Art. 3(a), (b), Chicago Convention.
[25] See Sec. 5.1.1.1, Civil Aviation Regulations Netherlands Antilles Part 5, Airworthiness; P.B. 2008, no. 19.
[26] See Sec. 7.1.1.1, Civil Aviation Regulations Netherlands Antilles Part 7, Aircraft Instruments and Equipment; P.B. 2008, no. 22.
[27] See Secc,. 4.1.1.1, 4.1.1.2, Civil Aviation Regulations Netherlands Antilles Part 4, Aircraft Registration and Marking; P.B. 2008, no. 25.
[28] E.g. Art. 5, 7, Chicago Convention; further see Sec. 7.1.1.2, *sub* (4), Civil Aviation Regulations Netherlands Antilles Part 7, Aircraft Instruments and Equipment; Sec. 8.1.1.2, *sub* (21), Civil Aviation Regulations Netherlands Antilles Part 8, Aircraft Operations; P.B. 2008, no. 22; cf. also Art. 1(j), Aviation Ordinance.
[29] Cf. e.g. Artt. 5-7, Chicago Convention, through their references to territories of other states than that of the one whose aircraft is concerned implicitly assuming that flights to which the Chicago Convention applies are carrying passengers between two different places on earth.
[30] Art. 1(l), Aviation Ordinance; emphasis added.
[31] See Art. 1(m), Aviation Ordinance.
[32] See Art. 1(o), Aviation Ordinance.
[33] See information provided at http://spaceexperiencecuracao.com/about/space-line/.
[34] See Artt. 1(d), 2(1.c), 5, 8, 10, Aviation Ordinance; Art. 1, Decree on regulated and non-regulated air transport; Sec. 9.1.1.1 *sub* (b), Sec. 9.1.1.4, Civil Aviation Regulations Netherlands Antilles Part 9, Air Operator Certification and Administration; P.B. 2008, no. 21.
[35] See Sec. 9.1.1.7, -*sub* (b), Civil Aviation Regulations Netherlands Antilles Part 9, Air Operator Certification and Administration.
[36] See Sec. 9.2.3.6, Civil Aviation Regulations Netherlands Antilles Part 9, Air Operator Certification and Administration.
[37] See Sec. 8.1.1.2, *sub* (1), Civil Aviation Regulations Netherlands Antilles Part 8, Aircraft Operations.
[38] See also Art. 13, Aviation Ordinance.

[39] Cf. Sec. 8.1.1.2, *sub* (54), Civil Aviation Regulations Netherlands Antilles Part 8, Aircraft Operations.
[40] Sec. Artt. 1(y), 182-183, Decree on aviation supervision; Sec. 8.1.1.2, *sub* (4), Civil Aviation Regulations Netherlands Antilles Part 8, Aircraft Operations. It may be pointed out that otherwise such sudden or abnormal changes are prohibited; cf. Art. 86(1), Decree on air traffic.
[41] See Sec. 8.6.1.36, *sub* (a), Civil Aviation Regulations Netherlands Antilles Part 8, Aircraft Operations.
[42] See Sec. 8.6.1.36, *sub* (b), Civil Aviation Regulations Netherlands Antilles Part 8, Aircraft Operations.
[43] See Sec. 8.6.1.36, *sub* (c), Civil Aviation Regulations Netherlands Antilles Part 8, Aircraft Operations.
[44] Art. 96(1), Decree on aviation supervision.
[45] See Art. 14(1), (5), Aviation Ordinance.
[46] Art. 14(3), Aviation Ordinance.
[47] See further Artt. 16-21, 23-26, 30-43, Aviation Ordinance.
[48] Sec. 8.1.1.2, *sub* (66), Civil Aviation Regulations Netherlands Antilles Part 8, Aircraft Operations.
[49] Cf. e.g. the author's The Sky is the Limit – But Where Does It End?, in *Proceedings of the Forty-Eighth Colloquium on the Law of Outer Space* (2006), 84-94; and the author's Space tourism, private spaceflight and the Law: Key aspects, 27 *Space Policy* (2011), 149-50.
[50] Further to Sec. 9.2.3.1, Civil Aviation Regulations Netherlands Antilles Part 9, Air Operator Certification and Administration, this means that Civil Aviation Regulations Netherlands Antilles Part 5, Airworthiness, which provides for all the detailed requirements in this respect, becomes applicable.
[51] *Ministeriële Beschikking met Algemene Werking van de 31ste maart 2008 ter uitvoering van de artikelen 59,77, tweede lid, 83, tweede lid, onder f, 84, eerste lid, onder d, 84, derde en vierde lid, 93 derde lid, 95, eerste lid, van het Landsbesluit toezicht luchtvaart*.
[52] See Sec. 5.4.1.2(a), Civil Aviation Regulations Netherlands Antilles Part 5, Airworthiness. Cf. further Art. 3(2), Decree on aviation supervision, which makes it possible, subject to certain conditions, to include in the register aircraft owned by companies not registered in Curacao.
[53] Art. 62, Decree on aviation supervision; see also Art. 64.
[54] See Sec. 5.4.1.3, *sub* (c), Civil Aviation Regulations Netherlands Antilles Part 5, Airworthiness; also Art. 1, sub (nn) resp. (ii), & Art. 71(1) resp. (2), Decree on aviation supervision.
[55] See Sec. 5.4.1.3, *sub* (f), Civil Aviation Regulations Netherlands Antilles Part 5, Airworthiness.
[56] See Sec. 5.4.1.11, *sub* (a), Civil Aviation Regulations Netherlands Antilles Part 5, Airworthiness.
[57] See Secc. 8.2.1.10, 8.2.1.11 & 8.2.1.12; Chh. 8.3, 8.4, 8.5, 8.8, 8.12, Civil Aviation Regulations Netherlands Antilles Part 8, Aircraft Operations.
[58] See Secc. 8.9.1.4, 8.9.1.6, 8.9.1.10, 8.9.2.3, 8.9.2.5, 8.9.2.7, 8.9.2.12, 8.9.2.13, 8.9.2.14, 8.9.2.18 & 8.9.2.19, Civil Aviation Regulations Netherlands Antilles Part 8, Aircraft Operations.
[59] See Ch. 8.6, Civil Aviation Regulations Netherlands Antilles Part 8, Aircraft Operations, in particular Sec. 8.6.1.1.
[60] See Secc. 8.6.1.6, 8.6.2.2, 8.6.2.6, 8.6.3.7, Civil Aviation Regulations Netherlands Antilles Part 8, Aircraft Operations; cf. also Art. 22, Aviation Ordinance.
[61] See Artt. 1(r), 6, 7, 12-57, Decree on aviation supervision.
[62] See Art. 128, Decree on aviation supervision.