International Best Practices and the Legal Framework for the Safe Transport of Dangerous Goods by Air in Nigeria

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Abstract

It is an inexorable fact that some dangerous goods possess some inherently beneficial utility when properly handled. Such dangerous goods are sometimes needed timeously for a variety of uses; medical, engineering, military, scientific and other uses. Because of the considerations of expeditious delivery of such dangerous goods, there is the need to deploy optimal and fast paced means of transportation in the delivery process. To meet the demands of timeliness in the delivery of dangerous goods for beneficial uses, there is an increasing use of aircraft for such haulage proposes. However in transporting dangerous goods by air, premium is always placed on the safety of the crew, passengers, cargo and the aircraft. This paper examines international best practices and the legal framework for the safe transport of dangerous goods by air in Nigeria. The paper also focused on the extant regulations, statutes and policies regulating the safe conveyance of dangerous goods by air within the prism of Annex 18 (The Safe Transport of Dangerous Goods by Air) to the Convention on International Civil Aviation. The paper emphasised the need to comply with the rules and regulations governing the safe transport of dangerous goods by air.

Introduction

Irrespective of their utilitarian nature, a considerable quantity of goods conveyed by virtually all modes of transportation globally are of a dangerous class. These goods are of different composition; highly flammable, explosives, corrosives, toxic, radioactive and even biologically dangerous. Theses goods, dangerous as they are, are of great utility in a variety of global,

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industrial, commercial, medical and research processes. Albeit, dangerous, most of these goods are being transported on a daily basis by different modes of transport, the world over. Some of these goods are often needed for timeous delivery, a requirement which can only be met through the use of the aircraft for their conveyance. The aircraft as a mode of transportation, in optimal terms, supersedes other modes in the quick delivery of such goods. Because of the advantages, of air transport, a major proportion of dangerous goods/cargoes are carried or transported by aircraft.

The safe transport of dangerous goods by air is heavily regulated against the background of the grave effects of a mishandling of such goods by persons who are involved in the management of such processes. Thus, there exist international best practices as enunciated under the provisions of Annex 18 (The Safe Transport of Dangerous Goods by Air) to the Convention on International Civil Aviation. The International Civil Aviation Organisation (ICAO) recognises the utility of some dangerous goods in different areas of human endeavour and consequently evolved a mechanism to ensure that such dangerous goods/cargoes can be carried with caution and thereby ensuring the safety of cargo handling operations in the aviation industry. ICAO's efforts in this direction culminated in the adoption of Annex 18. Adjunctive to Annex 18 is the Technical Instructions for the Safe Transport of Dangerous Goods by Air. Annex 18 and the Technical Instructions provide the broad guidelines on International best practices in the safe transport of dangerous goods by air. This is without prejudice to the existence of other extant guidelines and regulations governing the carriage of dangerous goods by air. These guidelines were often localised (not of international application) but effective in their application in the various countries.

In Nigeria, there exists various statutes, regulations and manuals of procedure for the safe transport of dangerous goods by air. The Civil Aviation Act vests the Nigerian Civil Aviation Authority (NCAA) with a wide latitude of powers to monitor and enforce compliance with the provisions of Annex 18 to the Chicago Convention and the ICAO Technical Instructions for the Safe Transport of Dangerous Goods by Air. In addition the

NCAA is authorised to submit variations to the Technical Instructions on behalf of Nigeria[2]. Aside the Civil Aviation Act, the carriage of dangerous goods by air is regulated by the provisions of Part 15 (Carriage of Dangerous Goods by Air) of the Nigeria Civil Aviation Regulations (NCARs)[3].

In essence the safe transport of dangerous goods by air in Nigeria is regulated by the provisions of Annex 18 to the Convention on International Civil Aviation.

Annex 18 provides the Standards and Recommended Practices (SARPs) for the safe transport of dangerous or hazardous goods by air transport. The safe transport of dangerous goods is also regulated under the provisions of section 62 of the Civil Aviation Act, 2006. The Nigerian Civil Aviation Regulations (NCARs) in Part 18 provides the technical requirements for the safe handling of dangerous goods while being transported by air.

International Best Practices and the Carriage of Dangerous Goods by Air in the Aviation Industry in Nigeria

International best practices in civil aviation can be regarded as the method of complying with a standard on a recommended practice that produces the desired safety result with the best benefit/cost outcome for the regulator and/or the industry[4]. Best practices are a set of guidelines, ethics or ideas that represent the most efficient or prudent course of action. Best practices are often set forth by an authority, such as a governing body or management, depending on the circumstances. While best practices generally dictate the recommended course of action, some situations require that such practices be followed[5]. Best

[2] See Section 62 of the Civil Aviation Act, cap C13 Laws of the Federation of Nigeria, 2004.

[3]The Nigeria Civil aviation Regulation (NCARs) were made by the Minister of Aviation pursuant to the provisions of Section 30 of the Civil Aviation Act, 2006.

[4] "Incorporating Industry Best Practices in the hierarchy of Standards and Recommend Practices" sourced from htt://www.icao.int/on 03/07/2008

[5] www.investtopedia.com/te sourced on the 27/02/2016

practices serve as a general outline for a variety of situations[6]. The phrase "best industry practice" is therefore subjective, because what may be regarded by one state as best industry practice may be regarded by another as inappropriate or undesirable for a variety of reasons[7].

The Convention on International Civil Aviation is cognisant of the disparate circumstances in the standing of states comprised in the International Civil Aviation Organisation (ICAO). In deference to the foregoing the Chicago Convention allows for flexibility in states compliance with the International Standards and Recommended Practices (SARPs) without compromising safety issues. Thus, any state member of ICAO which finds it impracticable to comply in all aspects, or to bring its own regulations or practices into full accord with any international standards or procedure after amendment of the latter, or any state which deems it necessary to adopt regulations or practice differing in any particular respect from those established by an international standard shall give immediate notification to the ICAO of the differences between its own practices and those established by the international standard[8]. The import of the provisions of Article 38 of the convention is that there is a paradigm shift from a rigid adherence to the international best practices, although without a compromise in safety standards.

With the adoption of international standards and recommended practices by the Council of ICAO, each contracting state undertakes to collaborate in ensuring the highest practicable degree of uniformity in regulations, standards, procedures and organisation in relation to aircraft, personnel, airways and anxillary services in all matters in which such infirmity will facilitate and improve air navigation[9].

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[6] ibid
[7] note 3 op.cit

[8] Article 38 of the Convention on International Civil Aviation
[9] Article 37. This article vests ICAO with the powers to adopt and amend from time to time, as may be necessary, international standards and recommended practices and procedures in such areas as communication systems, characteristics of airports, Rules of the air, air traffic control services meteorological information

The international best practices regulating the safe transport of dangerous goods by air are derivatives of Annex 18 (The Safe Transport of Dangerous Goods by Air) to the Chicago Convention. Annex 18 has been replicated in the provisions of Part 15 (Carriage of Dangerous Goods by Air) of the Nigerian Civil Aviation Regulations (NCARs).

Annex 18 as the fulcrum of the Safe Transport of Dangerous Goods by Air, specifies the broad Standards and Recommended Practices (SARPs) which compliance enables dangerous goods to be air freighted safely and timeously. The Annex contains detailed and well thought out provisions which require only infrequent amendments. The Annex also makes binding upon contracting states the provisions of the Technical Instructions for the Safe Transport of Dangerous Goods. The Technical Instructions contain very detailed, comprehensive and numerous instructions for the safe handling of dangerous cargo.

The Technical Instructions, as one of the manuals, in the International best practice regime require frequent updating in order to align with the dynamics in developments in the chemical, industrial and manufacturing processes. A special procedure has been adopted by the Council of the ICAO to enable the Technical Instructions to be constantly reviewed regularly in tandem with new products and advances in technology[10].

International best practices as enshrined in ICAO requirements for dangerous goods were developed by a panel of experts which was established in 1976. The Technical Instructions are kept aligned with the recommendations of the United Nations Committee of Experts on the Transport of Dangerous Goods and with the regulations of the International Atomic Energy Agency[11].

In accordance with international best practices, the ICAO requirements for the safe handling of dangerous goods firstly identify a limited list of those substances which are unsafe to carry in any circumstances and then show how other

[10] The Convention on International Civil Aviation Annexes 1 to 18
[11] ibid

potentially dangerous articles or substances can be transported safely[12]. The nine hazard classes are those determined by the United Nations Committee of Experts and are used for all modes of transport[13].

Nigeria's aviation industry has complied substantially in adhering to international best practices in the handling and safe transport of dangerous goods by air. This, she has done through the replication of the provisions of Annex 18 (The Safe Transport of Dangerous Goods by Air) of the Nigerian Civil Aviation Regulations (NCARs) made pursuant to the provisions of section 30 of the Civil Aviation Act.

Part 15 of the NCARs embodies a comprehensives and robust attempt at ensuring that the carriage of dangerous goods by air is done with strict adherence with respect to that activity in the aviation industry.

The Statutory Responsibility of the Nigerian Civil Aviation Authority in the Safe Carriage of Dangerous Goods by Air

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[12] ibid

[13] The nine hazard classes are those determined by the United Nations Committee of Experts and are used for all modes of transport Class 1 includes explosives of all kinds, such as sporting ammunition, fireworks and signal flares. Class 2 comprises compressed or liquefied gases which may also be toxic or flammable; examples arc cylinders of oxygen and refrigerated liquid nitrogen. Class 3 substances are flammable liquids including gasoline, lacquers, paint thinners. etc. Class 4 covers flammable solids, spontaneously combustible materials and materials which, when in contact with water, exit flammable gases (examples are some powdered metals, cellulose type film and charcoal). Class 5 covers oxidizing material, including bromates, chlorates or nitrates; this class also covers organic peroxides which are both oxygen carriers and very combustible. Poisonous or toxic substances, such as pesticides, mercury compounds, etc., comprise Class 6, together with infections substances which must sometimes b shipped for diagnostic or preventative purpose. Radioactive materials are in Class 7; these are mainly radioactive isotopes needed for medical or research purposes but are sometimes contained in manufactured articles such as heart pacemakers or smoke detectors. Corrosive substances which may be dangerous to human tissue or which pose a hazard to the structure of an aircraft are dealt with in Class 8 (for examples, caustic soda, battery fluid, paint remover). Finally, Class 9 is a miscellaneous category for other materials which are potentially hazardous in air transport, such as magnetized materials which could affect the aircraft's navigational systems.

Dangerous goods are articles or substances which are capable of posing a risk to health, safety, property or the environment and which are shown in the list of dangerous goods in the Technical Instructions or which are classified according to those instructions[14]. Despite the existence of dangerous goods and their terrible consequences if not properly handled, such goods are often accepted for transportation by all modes of transport including by air. Transportation of dangerous goods by air is heavily regulated by statutes, regulations and subject to the imperatives of international best practices.

In consonance with the foregoing, one of the operational responsibilities cast on the Nigerian Civil Aviation Authority (NCAA) is the regulation of the transportation of dangerous goods by air. The NCAA is mandated to monitor and enforce compliance with the provisions of Annex 18 (The Safe Transport of Dangerous Goods by Air) to the Chicago Convention and the International Civil Aviation Organisation Technical Instructions for the Safe Transport of Dangerous Goods by Air. The Authority in the same vein is authorised to submit variations to the Technical Instructions on behalf of Nigeria where necessary[15].

Conterminous with the monitoring and enforcement powers of the NCAA in the area of transportation of dangerous goods by air is the powers of the Authority with request to the conditions under which passengers and goods may be carried by air and under which aircraft may be used for other gainful purposes and for prohibiting the carriage by air of goods of such class or classes as may be prescribed.

The Nigerian Civil Aviation authority (NCAA) is vested with a wide latitude of powers in the enforcement of the extant Standards and Recommended Practices (SARPs) regulating the safe carriage of dangerous goods by air in the Nigerian aviation industry. The NCAA does this by enforcing both the provisions of the Civil Aviation Act and ensuring

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[14] NCARs 15.1

[15] See Section 62 of the Civil Aviation Act, 2006 which vests an obligatory power on the NCAA in regulating the safe transport of dangerous goods by air.

compliance with the provisions of Part 15 of the Nigerian Civil Aviation Regulations (NCARs)[16].

The Carriage of Dangerous Goods by Air under the Nigerian Civil Aviation Regulations

In compliance with global best practices in the aviation industry with respect to the carriage of dangerous goods by air, Nigeria has by virtue of the provisions of Part 15 (Safe Transport of Dangerous Goods by Air) incorporated the principles, Standards and Recommended Practices (SARPs) governing the safe transport of dangerous goods by air as contained in Annex 18 (The Safe Transport of Dangerous Goods by Air) to the Chicago Convention and the ICAO Technical Instructions for the Safe Transport of Dangerous Goods by Air (Doc 9284).

Scope and Application of Part 15 (Carriage of Dangerous Goods by Air) of the NCARs

By the provisions of NCARs 15.2.1 of part 15 (Carriage of Dangerous Goods by Air) the general provisions of the Regulations are applicable to:

(a) any aircraft used for the conveyance of dangerous goods;
(b) any person who-
  (i) offers dangerous goods for conveyance by air;
  (ii) conveys dangerous goods by air; or
  (iii) accepts dangerous goods conveyed by air;
(c) any passenger or flight crew member on board or to be taken on board or to be taken on board an aircraft
(d) all international operations of civil aircraft.

[16] See Section 30(2) (f) of the Civil Aviation Act which regulates the powers of the NCAA with respect to the conditions under which passengers and goods may be carried by air and under which aircraft may be used for other gainful purposes, and for prohibiting the carriage by air of goods of such class or classes as may be prescribed.

On the other hand, under the provisions of NCARs 15.2.2. The Regulations are inapplicable in respect of:-

(a) dangerous goods carried in an aircraft where such goods are intended;
  (i) to provide medical aid to a patient during a flight;
  (ii) to provide veterinary aid or a humane killer for an animal during a flight;
  (iii) for spraying, dusting or dropping in connection with agricultural, horticultural, forestry or pollution control operations; or
  (iv) for purposes of game and livestock management during a flight;
(b) articles and substances which would otherwise constitute dangerous goods but which are on board the aircraft in accordance with the appropriate airworthiness requirements and the provisions of the operations manual concerned provided the articles and substances intended as replacements for such articles and substances, shall be conveyed in accordance with the requirements and standards prescribed in ICAO Doc 9284 – Dangerous Goods Manual.
(c) articles and substances intended for the personal use of passengers and flight crew members to the extent as prescribed in ICAO Doc. 9284

NCARs 15.3 however provides a bland prohibition in that no person shall offer, convey or accept in an aircraft:

(a) the dangerous goods specifically identified by name or by generic description in ICAO Doc. 9284 and these Regulations, as being forbidden for conveyance by air under any circumstances;
(b) the dangerous goods identified in ICAO Doc. 9284 and these Regulations as being forbidden for conveyance by air under normal circumstances;
(c) any other dangerous goods, unless in accordance with the provisions of the Civil Aviation Regulations and the requirements and standards prescribed in ICAO Doc 9284 and these Regulations; and
(d) infected live animals

However, under the provisions of NCARs 15.4.1 the NCAA may, upon application in writing by any person referred to in Section (2) (1) (b) of the Regulations, exempt such person from the provisions of section 3 of the Regulations in the case of:

(a) extreme urgency;
(b) other forms of conveyance being inappropriate; or
(c) full compliance with the provisions of these Regulations being contrary to aviation safety.

The Authority may grant an exemption referred to in sub-section (1), under such conditions and for such period which the Authority may determine, but only after the applicant has made every effort to achieve the overall level of safety required by the Civil Aviation Act, these Regulations and ICAO Doc. 9284[17].

The listing, classes and divisions of dangerous goods shall be as prescribed in these Regulations and ICAO Doc 9284[18].

There is a palpable influence of international best practices in the provisions of NCARs 15.2.2 to 15.5. This is evident in the copious references made to ICAO Doc. 9284. ICAO Doc 9284, which is the Technical Instructions for the Safe Transport of Dangerous Goods by Air, is an associated document to Annex 18. ICAO Doc. 9284 provides the technical specifications for the handling and air freight of dangerous goods by air.

While NCARs 15.2.2 provides exemptions in respect of dangerous goods to be carried by air where such goods are for medical procedures, veterinary aid or for euthanasia in respect of an animal during flight and for agricultural purposes, or for specialised usage in conformity with the prescriptions f ICAO Doc. 9284 – Dangerous Goods Manual. However there is a

[17] NCARs 15.4.2. This Regulation, albeit grants an exemption to an applicant but a condition precedent to the grant of such exemption is that the applicant must have exhausted and made every effort to achieve the safety requirement of both the Civil Aviation Act, the NCARs and ICAO Doc. 9284.

[18] NCARs 15.5

bland prohibition of goods identified by their specific or generic names in ICAO Doc. 9284.

It is noteworthy that there are exemptions, irrespective of whether the dangerous goods are outrightly prohibited from being freighted by air. These exemptions apply in cases of extreme urgency, other forms of conveyance being inappropriate or where a rigid adherence to the Regulations would be contrary to aviation safety.

The Powers of Designated Dangerous Goods Inspectors in the Carriage of Dangerous Goods by Air

In order to give effect to the provisions of Annex 18, the Technical Instructions for the Safe Transport of Dangerous Goods by Air and the NCAR 15, the Nigerian Civil Aviation Authority is empowered vide the provisions of NCARs 15.7.1 to designate dangerous goods inspectors for the purpose of ensuring aviation safety despite the presence, though legally, of dangerous goods on board aircraft.

The dangerous goods inspectors are vested with a wide latitude of powers to; enter and inspect any aerodrome or hangar[19], they may also enter premises where goods intended for conveyance by air are made, produced, manufactured, where goods or baggage intended for conveyance by air are packed, held or received or where goods or baggage are received after being conveyed by air[20].

A designated dangerous goods inspector is also vested with powers to enter aircraft, vehicle, freight container or unit load device used for the conveyance of dangerous goods in order to ensure compliance with the provisions of the Civil Aviation Act and the NCARs[21]. He may also request any

[19] NCAR 15.8.1 (a) (i). Irrespective of the use of the auxilliary verb "may" in this regulation, its interpretation is obligatory and should be construed as non-optional. See the case of Animashaun v. Ogundimu (2016) All FWLR (Pt 832) 1783 at 1803 paras C-D, for the connotation of the word "may" in statutes. However, considering the catastrophic consequences of dangerous goods on aviation safety, it is the submission of the author that "may" as used in Regulation 15.1.8 should be accorded an obligatory interpretation for purpose of safe and seamless aviation practices.

[20]NCAR 15.8.1 (a) (ii)

[21] NCAR 15.8.1 (a) (iii)

person to produce or furnish him or her with all documents and information relating to dangerous goods or baggage in so far as such request may be necessary for the proper execution of his or her functions[22].

A designated dangerous goods inspector who on reasonable grounds suspects that any baggage, consignment, freight container or unit load device contains goods which may not, in terms of the provisions of the Civil Aviation Act and the Regulations be conveyed by air, or goods which constitute a danger or potential danger to persons, aircraft or any other property, may inspect such baggage, consignment, freight container or unit load device and, if he or she deems it necessary in the interest of aviation safety, order that such goods be detained and not be loaded in an aircraft[23].

A corollary of the power to search vested in designated dangerous goods inspector is the power to search. Acting pursuant to this power, an inspector can search any baggage, consignment, freight container or unit load device presented or accepted for conveyance by air. This power also extends to instances where it has been received after such conveyance. He may also search any person who has disembarked from an aircraft or who intends to board an aircraft. The may search his baggage and other personal effects in order to ascertain whether dangerous goods have been or are to be conveyed by air. Searches are to be conducted with strict regard to decency and

[22] NCAR 15.8.1 (b).Where such requests are made by a designated dangerous goods inspector, a person to whom it is directed should be compelled to comply accordingly.

[23] NCARs 15.8.2. The detention of goods and the consequent prevention of same from being loaded in an aircraft by a designated dangerous goods inspector must satisfy the test of reasonability. The designated dangerous goods inspector must have reasonable grounds to base his suspicion. In the case of Daniel v. FRN (2014) All FWLR (Pt 735) p.319 at 720 the Court of Appeal defined a reasonable man as; reasonable person is a person with reason having a faculty of the mind by which he distinguishes truth from falsehood, good from evil. A reasonable person is a fair, proper and just and unbiased person An impartial observer

order and a person shall only be searched by a person of the same gender[24].

A designated dangerous goods inspector must satisfy himself or herself that the mass, quantity or composition of any goods or baggage offered for conveyance, or goods or baggage on board an aircraft complies with the requirements and standards prescribed in ICAO Doc 9284[25].He may also require goods to be removed from an aircraft if the ICAO Doc 9284 requirements are not complied with[26] and can request any person to produce any document for inspection where such document relates to a consignment intended for conveyance[27]. He may even question any person handling dangerous goods inorder to ascertain whether that person complies with the provisions of the Civil Aviation Act and the Regulations and the standards prescribed in ICAO Doc 9284[28].

Regulations Governing the Packing and Packaging of Dangerous Goods for Freight by Air

Dangerous goods or hazardous goods are solids, liquids or gases that can harm people, other living organisms, property, or the environment. They are often subject to chemical regulations[29].

In the United States, United Kingdom and sometimes in Canada, dangerous goods are more commonly known as hazardous materials (abbreviated as HAZMAT or hazmat). Hazmat teams are personnel specially trained to handle dangerous goods, which include materials that are radioactive, flammable, explosive, corrosive, oxidising, asphyxiating,

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[24] NCARs 15.8.3. The deference to gender sensitive issues is meant to give effect to the constitutional requirements of right to dignity of the human person as enshrined in Section 34 of the constitution of the Federal Republic of Nigeria 1999 (as amended)

[25] NCARs 15.8.3(c)

[26] NCARs 15.8.3(d)

[27] NCARs 15.8.3(e)

[28] Vide the provisions of NCARs 15.8.3(f) a designated dangerous goods inspector is also vested with a wide latitude of powers to interrogate any person on a wide range of issues relating to his handling of dangerous goods meant for conveyance by air transport.

[29] https://en.m.wikipedia.org/wiki/Dangerous goods

biohazardous, toxic, pathogenic, or allergenic. Also included are physical conditions such as compressed gases and liquids or hot materials, including all goods containing such materials or chemicals, or may have other characteristics that render them hazardous in specific circumstances[30].

ICAO recognises the importance of this type of cargo and has taken steps to ensure that such cargo can be carried safely. This has been done by adopting Annex 18 together with the associated document Technical Instructions for the Safe Transport of Dangerous Goods by Air. Other codes have existed for regulating the carriage of dangerous by air, but these did not apply internationally or were difficult to enforce internationally and moreover were not compatible with the corresponding rules of other transport modes[31].

Annex 18 specifies the broad Standards and Recommended Practices (SARPs) to be followed to enable dangerous goods to be carried safely. The Annex contains fairly stable material requiring only infrequent amendment using the normal Annex Amendment process. The Annex also makes binding upon contracting states the provisions of the Technical instructions, which contain the very detailed and numerous instructions necessary for the correct handling of dangerous cargo. These requires frequent updating as developments occur in the chemical, manufacturing and packaging industries, and a special procedure has been established by the council to allow the Technical Instructions to be revised and reissued regularly to keep up with new products and advances in technology[32]

The ICAO requirements for dangerous goods have been largely developed by a panel of experts which was established in 1976. This panel continues to meet and recommend the necessary revisions to the Technical Instructions.

As for as possible, the Technical Instructions are aligned with the Recommendations of the United Nations Committee of Experts on the Transport of Dangerous Goods and the regulations of the International Atomic Energy Agency (IAEA). The use of these common bases of all forms of

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[30] ibid
[31] See Annex 18 to the Chicago Convention
[32] ibid

transport allows cargo to be transferred safely and smoothly between air, rail and road modes[33].

The ICAO requirements for the safe handling of dangerous goods firstly identify a limited list of these substances which are unsafe to carry in the circumstances and then show how other potentially dangerous articles or substances can be transported safely.

In compliance with global best practices in the aviation industry with respect to the carriage of dangerous goods by air, Nigeria has, by virtue of the provisions of Part 15 (Safe Transport of Dangerous Goods by Air) incorporated the principles, Standards and Recommended Practices (SARPs) governing the safe transport of dangerous goods by air as contained in Annex 18 to the Chicago Convention and the ICAO Technical Instructions for the Safe Transport of Dangerous Goods by Air (Doc 9284).

Under NCAR 15.11.1 a shipper is under an obligation to ensure that all dangerous goods which are prepared or offered for conveyance by air, are packed in accordance with the provisions of
the Regulations and the requirements and standards as prescribed in ICAO Doc 9284[34].

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[33] ibid

[34] In the case of N.I Industries Inc v. Department of Transportation, FAA, US Court of Appeal for the District of Columbia No. 89-1089 (1990); 22 AVI 17, 930 1989 90 the Court upheld the decision of the FA in finding that the manufacturers was liable for 370 violations of the Hazardous Materials Regulations and the $50,000 penalty was within the scope of the Authority of the FAA. The manufacturer of a chemical product violated the Hazardous Materials Regulation Act when it delivered to an air carrier 79 drums of hazardous chemicals which were rejected by the carrier for failure to comply with applicable requirements. The drums were not properly marked, labelled, described, packaged or in the condition required for air transportation. There was no merit in the contention that the Hazardous Materials Regulations Act did not apply to the manufacturer because the Act applied only to shippers and carriers and it had performed in neither of these roles. The applicable regulations placed responsibility with one who transported hazardous materials or caused them to be transported regardless of whether the person was a shipper or a carrier. The FAA concluded that the manufacturer knowingly offered the hazardous materials for air transportation.

In similar terms, a shipper shall ensure that any packaging used for the conveyance of dangerous goods by air shall;

(a) comply with the material and construction specifications of, and be tested initially in accordance with the requirements and standards as prescribed in ICAO Doc 9284; and
(b) be of quality and constructed and securely closed so as to prevent leakage caused by changes in temperature, humidity, pressure or vibration under normal conditions of conveyance by air[35].

A shipper shall ensure that inner packaging is packed, secured or cushioned to prevent its breakage or leakage and to control its movement within the outer packaging during normal conditions of conveyance by air[36].

A shipper shall ensure that packaging in direct contact with dangerous goods is resistant to any chemical or other action of such goods and cushioning, and that absorbent materials do not react dangerously with the contents of the

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[35] NCARs 15.11.2

[36]See NCARs 15.11.3See alsohttp://en.wikipedia.org/wiki/Air Safety. With respect to ValuJet Airlines flight 592, the investigation determined that improperly packaged chemical oxygen generators (used for the drop-down oxygen masks in the aircraft cabin had been loaded into the cargo hold. Oxygen generators produce oxygen through a chemical reaction that also generates hundreds of degrees of heat. When installed for use in the ceiling above the passenger seats they are surrounded by heat resistant shielding and present no fire hazard. On this flight they had been put loosely into a cardbox for shipment from a maintenance facility. It is likely that one or more of the generators ignited during or immediately after take-off producing an oxygen rich environment. He fire spread to an aircraft tyre that was also carried in the hold. Ordinarily, the fire would have smothered itself, because of the airtight design of that cargo compartment. But the oxygen generators kept feeding oxygen to the fire defeating the smothering design of the Mcdonnel Douglas DC-9 Cargo hold.

The fire rapidly burned through the passenger cabin floor; incapacitating all aboard with smoke and poisonous gases very quickly. The pilots although having smoke masks and separate oxygen supplies, had no hope of maintaining control as control cables and electrical wiring burned through. The maintenance facility (Sabre Tech) was subjected to large fines and ValuJet, due to this accident and other irregularities was grounded.

receptacles[37]. He shall also ensure that packaging for which retention of a liquid is a basic function, is capable of withstanding, without leaking, the pressure as prescribed in ICAO Doc.9284[38]. Receptacles that had, hitherto, been used for the conveyance of dangerous goods by air shall not be re-used by the shipper until such receptacle has been inspected by such shipper and found free from corrosion or other damage[39].

Where a receptacle is re-used for the conveyance of dangerous goods, all necessary measures shall be taken by the shipper to prevent contamination of subsequent dangerous goods conveyed therein[40].

If because of the nature of their former contents, uncleaned empty receptacles may present a hazard, the shipper shall ensure that such receptacles are tightly closed and treated according to the hazard that they constitute[41].A shipper shall ensure that no harmful quantity of any dangerous substance adhere to the outside of the package.

Responsibility of the Shipper in the Transport of Dangerous Goods by Air

There are certain responsibilities cast on a shipper in ensuring that the transport of dangerous goods by air does not constitute a hazard. In consonance thereto, a shipper shall ensure that dangerous goods offered for conveyance by air, are not dangerous goods identified as prohibited from conveyance by air under section 3 and that in addition such goods are:

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[37] NCARs 15.11.4. This Regulation requires a designated dangerous goods inspector to be sufficiently knowledgeable about the chemical properties in such goods and their propensity for reaction when in contact with other goods.

[38] NCARs 15.11.5. A designated dangerous goods inspector is mandated under this Regulation to ensure that where such goods is liquid, is leak-proof despite the attendant pressure arising from its packaging.

[39] By the provisions of NCARs 15.11.6 the re-use of any receptacle --- used, is prohibited but can only be re-used on the condition precedent that it is free from corrosion or other damage.

[40] Flowing from the provisions of NCARs 15.11.6 where a receptacle is re-used for the package and subsequent transport of dangerous goods, measures should be taken to ensure that they are free from contamination.

[41] NCARs 15.11.8

(a) identified classified, packed, marked and labelled; and
(b) accompanied by a properly executed dangerous goods transport document, in accordance with the provisions of the NCARs and the requirements and standards as prescribed in ICAO Doc. 9284[42].

It is also the responsibility of a shipper to ensure that any person employed by him or her, or where such a person is involved in the preparation of a consignment of dangerous goods to be conveyed by air, is trained in accordance with the provisions of section 9[43].

Labelling and Marking of Dangerous Goods as Safety Measures in Conveyance by Air

A standard precautionary measure employed for the safe transport of dangerous goods is the procedure of labelling and marking[44].Dangerous goods are labelled and marked with signs and colours which indicate the genius of goods they are and the kind of danger or hazard they pose when incorrect procedures are usedin their handling or transportation process. Labelling[45] and marking[46] of dangerous goods provide information as to the volatility, combustibility, toxicity or flammability of such goods.

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[42] NCARs 15.12.1

[43] NCARs 15.12.2 casts a duty on a shipper to ensure the proper training of a person involved in the preparation of a consignment of dangerous goods to be transported by air.

[44] In the United States, dangerous goods are often indicated by diamond-shaped signage on the item, its container, or the building where it is stored. The colour of each diamond indicates its hazard e.g; flammable is indicated with red, because fire and heat are generally of red colour, and explosive is indicated with orange, because mixing red (flammable) with yellow (oxidizing agent) creates orange. A non-flammable or non-toxic gas is indicated with green, because all compressed air vessels are this colour in France after World War II, and France was where the diamond system of hazmat identification originated see generally https://en.m.wikipedia

[45] Labelling mainly means symbols (and handling labels) displayed on small means of packages (usually less than 450 litres)

[46] Making refers mainly to UN number, proper shipping names, UN specification marks and other markings of applicable (i.e orientation arrows, environmental hazardous substances mark for UN 3077 and UN 3082 and excepted quantities mark. See www.chemsafetypro.com7 Topics 7 TDG

Copious provisions are made under NCARs 15.13 for the labelling and marking of dangerous goods for transport by air. Under the Regulations, any person who offers any package containing dangerous goods for conveyance by air, shall ensure that such package is labelled with the appropriate label or labels in accordance with the requirements and standards and prescribed in ICAO Doc 9283[47] Similarly, any person who offers any package containing dangerous goods for conveyance by air, shall ensure that such package is marked with the proper shipping name, UN shipping number, class of hazard, subsidiary risk, packing group, packing instruction and any authorisation reference of the contents of the package in accordance with the requirements and standards as prescribed in ICAO Doc 9284[48].

There are other provisions regulating the labelling and marking of dangerous goods for transport by air. Any person who offers any package containing dangerous goods for conveyance by air, shall ensure that such packaging which is manufactured in accordance with a packaging specification as prescribed in ICAO Doc 9284, is marked with the appropriate packaging specification marking as prescribed in ICAO Doc 9284[49]. Under the Regulations, no packaging shall be marked with a packaging specification marking unless such packaging complies with the appropriate packaging specification as prescribed in ICAO Doc 9284[50].

Any person who offers dangerous goods for conveyance by air, shall unless otherwise provided for in ICAO Doc 9284 complete, sign and provide the operator with a dangerous goods transport document and such other appropriate documents[51]. The document shall contain the information as prescribed in ICAO Doc 9284 as well as a declaration, signed by the person

[47] NCARs 15.13.1
[48] NCARs 15.13.2
[49] NCARs 15.13.3(a)
[50] NCARs 15.13.3(b)
[51] NCARs 15.14.1 provides for a comprehensive manifest or inventory of dangerous goods to be transported by air to be furnished by the offer or to the designated dangerous goods inspector.

referred to, indicating that the dangerous goods offered for conveyance by air are:

(a) fully and accurately described by their proper shipping names;
(b) identified, classified, packed, marked and labelled in accordance with the requirements and standards as prescribed in ICAO Doc 9284
(c) in proper condition for conveyance by air in accordance with the requirements and standards and prescribed in ICAO Doc 9284; and
(d) not dangerous goods identified and prohibited from conveyance by air in line with section 3[52].

Miscellaneous Provisions Regulating The Transportation Of Dangerous Goods By Air

The provisions of NCARs part 15 (Carriage of Dangerous Goods by Air) are elaborate enough to cater for a variable of safety and precautionary measures designed to ensure the safe transport of dangerous goods by air. Certain conditions precedent are laid in the Regulations with respect to acceptance procedures governing the air freight of dangerous goods[53]. The operator of an aircraft in which dangerous goods are to be conveyed shall provide the pilot-in-command, as soon as practicable before departure of the aircraft, with the written information as prescribed in ICAO Doc 9284[54].

Provisions are also made with respect to inspection for damage or leakage of dangerous goods by an operator[55]. The operator of an aircraft is under an obligation to inspect a unit

[52] NCARs 15.14.2
[53] NCARs 15.15.1 & 2.In the overall interest of safety of air transport, an operator of an aircraft in which dangerous goods is to be transported is vested with the power to observe in strict compliance, acceptance procedures with respect to such conveyance. Pursuant thereto, he is vested with the power to refuse goods which are not accompanied by a completed dangerous goods transport document. He also has the power of refusal until and unless he has inspected the exterior of the package or other container meant for such conveyance. In doing this, the operator shall use an acceptance checklist.
[54] See NCARs 15.16.1 & 2
[55] In general terms, the provisions of NCARs 15.17.1 to 15.17.9 provide for inspection for damage or leakage by operators.

load device before loading such device in the aircraft to ensure that there is no damage to, or leakage from any dangerous goods contained therein. No damaged or leaking package, overpack, freight container or unit load device shall be loaded in an aircraft[56]. The operator of an aircraft in which dangerous goods are to be conveyed shall comply with the storage and loading provisions of the Regulations and the requirements and standards as prescribed in ICAO Doc. 9284[57]. Dangerous goods are prohibited from being stored in either an aircraft cabin occupied by passenger or on the flight deck of same[58].

NCARs 15.20.1 provides for the separation and segregation of dangerous goods being conveyed by aircraft, where contact with one another will produce adverse or dangerous reactions in the event of leakage. Dangerous goods are to be secured such a manner that will prevent their movement in flight which could change the orientation of the packages[59]. Unless otherwise provided for in ICAO Doc 9284, a package or overpack containing dangerous goods and bearing a "cargo aircraft only" label, shall be loaded in a manner that any flight crew member or other person authorised by the operator, can see, handle and where size and weight permit, separate such package or overpack from other cargo in flight[60].

For purpose of safety, where there is an accident or incident involving the transportation of dangerous goods, it must be reported[61].The Accident Investigation Bureau(AIB) shall investigate dangerous goods accidents and incidents of

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[56] See generally NCARs 15.17.3, which Regulation expressly, is literally prohibitory in nature

[57] NCARs 15.18

[58] NCARs 15.19 provides essentially for loading restrictions on dangerous goods in cabin or flight deck.

[59] NCARs 15.21.1

[60] NCARs 15.22 regulates carriage of dangerous goods by cargo aircraft. Thus, goods designated to be transported by and exclusively by cargo aircraft only shall be loaded in such manner that any flight crew member or other person authorised in that behalf can see and supervise in its entirety the safe transport of such cargo while in transit.

[61] NCAR 15.23.1 provides for the reporting of dangerous goods accident and incident. This Regulation complies with the requirements of compulsory reporting of accidents and incidents in the aviation industry.

which the NCAA and or the Accident Investigation Bureau is notified in line with section 23(1), and the Civil Aviation (Accident Investigation) Regulations shall apply equally to such investigations[62].

The operator of an aircraft in which dangerous goods are conveyed within or outside Nigeria shall within 48 hours after the discovery of:

(a) any undeclared or mis-declared dangerous goods; or
(b) dangerous goods not permitted under section 28 on board the aircraft or in the baggage of a passenger or flight crew member, notify the NCAA or the appropriate authority thereof, as the case may be[63].

Passengers and flight crew members are prohibited from carrying dangerous goods as, or in, carry-on-baggage or checked baggage, or on his or her person, except in accordance with the requirements and standards as prescribed in ICAO Doc 9284[64].

Conclusion

Because of the optimal speed of the aircraft as a means of conveyance of both passengers and goods and the utility of certain dangerous goods in several areas of human activity, Regulations have been evolved to guard the safe transport of dangerous goods by air. The ascendancy of Annex 18 (The Safe Transport of Dangerous Goods by Air) to the Chicago Convention in this regard remains sacrosanct. This is because all other regional, national and private regulatory interventions in ensuring the safe transport of dangerous goods by air derive

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[62] NCARs 15.24. See also the functions of the Accident Investigation Bureau (AIB) as provided for under section 29 of the Civil Aviation Act 2006. The purpose of accident investigation in cases of dangerous goods accidents/incidents is not to apportion blame or liability in consonance with international best practices. See Section 29(12) of the Civil Aviation Act, 2006.

[63] NCARs 15.26 makes provisions for the timely and timeous reporting/notification of undeclared or misdeclared dangerous goods.

[64] NCARs 15.28 prohibit crew members from carrying dangerous goods. This prohibition also applies to passengers. Where permitted, such goods are to be carried in compliance with ICAO standards

their essence from Annex 18. Nigeria's NCARs Part 15 has made elaborate provisions for the Safe Transport of Dangerous Goods by air. ICAO's Doc 9284 also plays a significant role in the Nigerian aviation industry's domestic efforts in ensuring the safe transport of dangerous goods by air. This can be gleaned from the fact that most of the provisions of NCAR Part 15 are drawn up in conformity with the provisions of ICAO Doc 9284.