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UNAPPROVED AIRCRAFT PARTS :

A LEGAL PERSPECTIVE

by

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A thesis submitted to the Faculty of Graduate Studies and Research in partial fulfilment of the requirements of the degree of Master of Laws.

ABSTRACT

Unapproved aircraft parts, or bogus parts as they have been referred to in the past, range from counterfeit sub-standard parts to parts which have been separated from the documentation detailing their prior use. These parts constitute a safety risk to the aviation industry and also have a negative economic effect on the industry. This thesis attempts to outline a complete set of legal solutions to contribute to the control and eradication of the problem of unapproved aircraft parts. Prior to a more detailed specifically legal study, a background to the problem is given, concentrating on the various sources and classifications of unapproved parts. The main elements of an anti-unapproved parts legal regime are then proposed, which would ideally be prescribed at international level to states for inclusion in their national legal regimes, and the extent to which current international law reflects the proposed regime is examined. Subsequently, a possible national anti-unapproved parts legal regime is proposed, drawing on the regulatory experience of the United States of America and Canada in dealing with this problem. Next, in addition to subject-specific regulation at national level, wider criminal law is also an effective tool in combating unapproved parts and the various possible criminal violations in unapproved parts scenarios are looked at. Finally, national private law is a further legal means both to combat unapproved parts and to control the effects of these parts, such as they do exist. Accordingly, private law remedies for unapproved parts will be examined, using the hypothetical example of an aircraft accident caused by unapproved parts.

RÉSUMÉ

Les pièces d'avion non conformées, appelées «pièces bidons» dans le passé, vont des contrefaçons de mauvaise qualité aux pièces qui ont été séparées de la documentation précisant leurs usages antérieurs. Ces pièces constituent un risque pour la sécurité de l'aviation et ont un effet négatif sur l'industrie. Ce mémoire expose un ensemble complet de normes qui mèneraient au contrôle puis à l'éradication du problème des pièces non conformées. Avant de plonger dans une analyse juridique détaillée, une vue d'ensemble du problème est donnée. Une attention particulière est portée aux sources de ces pièces ainsi qu'à leur classification. Les éléments principaux d'un régime juridique anti-pièces non conformées sont ensuite proposés. Idéalement, une instance internationale obligerait les États à inclure ces éléments dans leurs droits nationaux. Ce mémoire examine la mesure dans laquelle le droit international présentement en vigueur reflète ou non les propositions énoncées. Subséquemment, est suggéré un régime normatif national contre les pièces non conformées. Cette solution s'inspire des expériences de réglementation des États-Unis et du Canada. En supplément à la réglementation nationale dirigée précisément au problème, des normes pénales de large portée sont efficaces afin de combattre les pièces non conformées. Les infractions criminelles possibles sont envisagées au moyen de scénarios d'utilisation des dites pièces. Finalement, le droit privé national se présente comme étant un autre outil propice à la lutte aux pièces non conformées et au contrôle de leurs effets. Conséquemment, les recours de droit privé vont être examinés en partant d'une hypothèse d'accident d'avion causé par des pièces non conformées.

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Christopher Kinghorn
Montreal, August 1998

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INTRODUCTION

In 1991, a United Airlines mechanic in the United States of America (US) was doing a routine overhaul on a Pratt and Whitney JT8D jet engine when he noticed something strange about a small but important part, a 4½-inch spacer bearing.[1] Its edges were rough and its color not quite right. It was a counterfeit part - a copy and not manufactured by Pratt and Whitney, an unapproved aircraft part[2]. The spacer bearing protects the engine's oil and critical components from 900°F engine gasses. If it fails, the engine fails. The bearing, which Pratt and Whitney, the only approved manufacturer, makes with a very expensive nickel alloy has a limited life of 20 000 flight hours. The counterfeit bearing, however, was manufactured from steel and would have failed after only approximately 600 flight hours. United Airlines alerted the US Federal Aviation Authority (FAA), which ordered all airlines using the JT8D engine (there are approximately 14 000 in service on Boeing 727 and 737's and Mc Donnell-Douglas DC-9 and MD-80's) to check for further examples of the counterfeit part. Sixteen airlines discovered 130 identical counterfeit parts. The parts were traced to a New York aircraft parts dealer. He had secured them from a Canadian ex-aircraft mechanic, who had been manufacturing the expensive parts for about $40 a piece. The ex-mechanic committed suicide. The dealer pleaded guilty to wire fraud and spent seven months in prison.

The example above illustrates a typical unapproved aircraft parts scenario in terms of the

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[1] This story was reported in F. Bajak "1991 Case is anatomy of scam's scope, risk" *The Detroit News* [06 December 1996].

[2] Throughout this thesis, the term 'unapproved part' will be used as opposed to the several other terms which have been used in the media and otherwise to refer to this problem, such as 'bogus parts', 'counterfeit parts' or 'suspected unapproved parts'. See *infra* at 54 for discussion.

parties involved and the potential danger these parts pose to aviation safety. This story ended happily, however, with successful early detection of the unapproved part and successful regulatory intervention to prevent further spreading and possible damage by similar parts. Furthermore, the offending dealer was successfully convicted and punished. It illustrates then that the successful combating of unapproved parts involves two processes[3]. On the one hand, technical processes need to be identified in order not only to make aircraft parts harder to copy but also to improve procedures and tests for detection of sub-standard unapproved parts. On the other hand, a comprehensive legal regime should exist not only to ensure that such technical steps and processes are mandated and their implementation overseen but also to control the legal effects of the existence of such parts (in terms of relations between private individuals, criminal violations, damage created by these parts etc).

This thesis proposes to suggest the elements of a complete legal regime for combating unapproved aircraft parts. Whereas previous legal studies on this subject have tended to focus on specific legal issues (such as for example only on litigation questions)[4], this study will more broadly address both international and national as well as public and private legal solutions.

This thesis is divided into five parts. First, the background to the problem will be analyzed and

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[3] See M. Schiavo, *Flying Safe, Flying Blind* (New York : Avon Books, 1997). "The subject/problem of bogus and unapproved parts in the Aviation Industry is real, perverse and it cannot be solved by any one industry segment." *Ibid* at 114, citing J.Frisbee.

[4] See J.Burt, "Bogus Aircraft : Offences and Defences" (1996) 61 J. Air L. & Com.861; R.Hedrick, " Bogus Aircraft Parts : Legal Problems and Considerations in Anticipation of Aircraft Accident Litigation" [1996] Ann. Air & Sp. L. 105; S. Kaiser, "What Can Be Done Against Bogus Aircraft Parts?" [December 1994] Air and Space Law 298; R. Luedemann, "Flying Underground : The Trade in Bootleg Aircraft Parts" (1996) 62 J. Air L. & Com. 93; and K. Quinn, "Bogus Issues and Unapproved Parts, Sorting Out the Competing Tensions" [Winter 1995] The Air and Space Lawyer 12.

an overview of the aircraft parts manufacturing industry and its regulation will be given. This will be followed by a review of the types and sources of unapproved parts. Next, in order to determine the scope of the need to combat the unapproved parts problem, the danger they pose to aviation safety and their economic effect on the aircraft parts industry will be examined. Factors will be identified which contribute to the existence and escalation of the problem.

Second, this study presents a detailed legal analysis of the problem. The departure point will be to identify those elements an effective anti-unapproved parts legal regime should contain such that states might be mandated by international regulation to include them in their national legal regimes. Furthermore, current international law will be evaluated not only to determine to what extent these elements are indeed prescribed but also to propose changes if necessary. A national legal approach to unapproved parts will then be examined : first from a public law perspective, and second, from a private law perspective. The public law subjects to be addressed include both aviation-specific regulation and broader criminal law. The private law focus will be on litigation among private entities which may arise as a result of unapproved parts. Since the US industry and law have addressed this problem earlier and in more detail than elsewhere, emphasis, albeit not exhaustively, is on United States law. The idea is rather to examine the *main elements* of the US legal regime as examples of elements of the proposed anti-unapproved parts legal regime. This is to examine the feasibility or not of the proposed regime elements based on actual experience, since efforts to address the problem in the US are further ahead than elsewhere[5]. In this sense, in areas where the US regime does not fully reflect

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[5] See International Federation of Airline Pilots' Associations (IFALPA), "Bogus Parts - Fake Spares in the Aviation Industry : a Problem on the Rise" [June 1994] Interpilot 10 [hereinafter *Interpilot*] at 12. "Trade in [unapproved] spares is most widespread in the USA. Manufacturers such as Boeing and Mc Donnell-Douglas have

the proposed regime, the Canadian approach will also be used as illustration, since unapproved parts have also received extensive attention in Canada. Thus this paper intends to identify a set of legal mechanisms which can be used by all states to combat unapproved parts, rather than to study in detail one state's law and jurisprudence surrounding these mechanisms.[6]

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been highlighting this problem since 1987, and other companies have been doing so for much longer...In Germany, no airlines have complained about bogus parts...to date." See also "Bogus Parts - Detecting the Hidden Threat" [January/February 1994] Flight Safety Digest 1 [hereinafter *Flight Safety Digest Jan/Feb '94*] at 5, citing Mr V. Brennan, civil air attaché with the British Embassy in Washington. It is not however that the problem does not exist elsewhere. See N. Beauclair, "L'industrie aeronautique doit faire face à des millions de pièces non conformes" [11-17 April 1994] Air & Cosmos/Aviation International 25. *"Les Americains ne sont pas les seuls à se soucier des pièces non conformes. Des groupes de travail ont également été constitués en Europe. Mais il semblerait que les actions ne soient pas prises avec autant de vigeur qu'il le faudrait dans tous les pays européens." Ibid.* See also Kaiser, *supra* note 4. "Whereas in the US, the first steps are already initiated to fight the trade in [unapproved] parts, developments in Europe lag behind." *Ibid.* In any event, in aviation law it is always worthwhile to consider the US approach since 50% of the world's air traffic is carried by US carriers and 75% of the world's aircraft are manufactured in the US, which means that a large majority of international aviation aircraft accident cases can be heard in the US. Furthermore, with regard to certain areas of law relevant to unapproved parts, for example product liability law, the US is the birth and breeding place. See H.T. Tebbens, *International Product Liability. A Study of Comparative and International Legal Aspects of Product Liability* (Alphen-aan-den-Rijn, The Netherlands : Sijthoff and Noordhoff, 1979).

[6] "It will not be the mission of the law to investigate in every disaster and for all harm suffered, whether there has been unlawful or negligent conduct, but to search constantly for the person who should in fairness be the bearer of the loss, and *the rules to establish the identity of such person on the basis of ethical convictions and socio-economic conditions. Narrow dogmas rooted in a previous society will then be of no help." Ibid.* at xx, translating "Paul Scholten, Thesis Amsterdam 1899" [emphasis added].

CHAPTER 1

BACKGROUND TO THE PROBLEM OF UNAPPROVED PARTS

This thesis will concentrate only on the manufacture and regulation of civil aviation aircraft parts (ie. non-government aviation), since the manufacture and installation of parts on government aircraft is different from civil aircraft.

This part will firstly examine the different elements which make up the aviation manufacturing industry. Second, an overview of the industry's regulation will be given, followed by an explanation of the various sources and types of unapproved parts. This will be followed by a look at the scope of the unapproved parts problem.

I. AN OVERVIEW OF THE AIRCRAFT PARTS INDUSTRY AND ITS REGULATION

A. Industry Elements

A common misconception is that an 'aircraft manufacturer' (such as Boeing or Airbus Industrie) manufactures the entire aircraft that bears its name. In fact, an aircraft is actually made up of four distinct sub-systems, each manufactured by independent manufacturers: (1) the structure and mechanical components including the airframe (ie. the fuselage and the wings), landing gear, passenger seats, etc.; (2) the powerplant (the engine); (3) the avionics (such as the auto-pilot unit, the cockpit voice recorder etc.); and (4) the electrical systems. The 'aircraft manufacturer', however, usually only manufactures the airframe. It then buys the sub-

assemblies from their individual manufacturers and mounts them onto the airframe of the aircraft. In most cases, the choice of sub-assembly rests with the final purchaser of the completed aircraft. For example, an aircraft might be offered with a choice of Rolls-Royce or General Electric engines.

The process of manufacture, sale and service/repair of an aircraft involves a number of key elements. First, there are the Prime Manufacturers. These are organizations that manufacture airframes, powerplants or propellers.[7] Prime Manufacturers buy the components of their products from organisations called Suppliers or Manufacturers. The US Air Transport Association's Specification 106 (ATA Spec. 106) defines a Manufacturer as "[a]n organization that makes components, units or piece parts for use in the construction or maintenance of aircraft and powerplants."[8] Second, the completed aircraft is then sold to an Owner, who may or may not be the Operator. Third, the aircraft will be maintained, serviced and repaired during its life by a Repair Station, which may be the owner/operator itself, or a sub-contractor hired by it. When a Repair Station needs replacement parts for the aircraft, it can get them from three sources. The first option is the part's Original Equipment Manufacturer (OEM) which would be the Prime Manufacturer or one of its Suppliers. The second possible source is an entity with a Parts Manufacturing Approval (PMA) which refers to another organization which has been granted approval to legally design and manufacture copies of parts manufactured by OEM's. A third source is a Distributor, which is defined by ATA Spec. 106 as "[a] business that

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[7] See (US) Air Transport Association (ATA), *Sources & Approved Parts. Qualification Guidelines (Specification 106)* (Washington, DC : ATA, 1996) [hereinafter *ATA Spec. 106*] at 1-8.

[8] *Ibid.* at 1-7.

does not manufacture its own products but purchases and resells such products. Such a business usually maintains a finished goods inventory and may provide additional value-added service."[9] Distributors are also referred to as parts brokers, traders, dealers or resellers.

B. Regulation of the Industry

Regulation of the aviation industry focuses on controlling three main processes : design; production; and operations and maintenance of aircraft and their components..[10]

1. International Regulation

The Chicago Convention[11] is the international instrument prescribing aviation regulatory controls to be implemented by individual states. Article 31 of this Convention obliges contracting states to issue Certificates of Airworthiness for aircraft bearing their nationality. Furthermore, Article 33 requires states to recognize certificates issued by other contracting states.

Article 37 of the Chicago Convention requires that contracting states undertake to collaborate in ensuring uniformity in their procedures to facilitate and improve air navigation. To this end, the International Civil Aviation Organization (ICAO), the organization set up in terms of the

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[9] *Ibid.* at 1-5.

[10] S. Mac Leod and M. Filler, "Introduction to the Federal Aviation Regulations" (Paper presented at (US) Airline Suppliers Association (ASA) Annual Conference, 20-22 July 1997) [unpublished].

[11] See *Convention on International Civil Aviation*, 7 December 1944, 15 U.N.T.S. 295 [hereinafter *Chicago Convention*].

Chicago Convention to administer international civil aviation, shall adopt Standards and Recommended Practices, which are contained in the Annexes to the Convention. The Annexes which are specifically relevant to the manufacture and operation of aircraft are Annex 6 (Operation of Aircraft) and Annex 8 (Airworthiness). Moreover, article 54(i) of the Convention obliges the ICAO Council to publish information relating to the advancement of air navigation and the operation of international air services. The following documents, published under this provision, provide further guidance to states regarding the airworthiness of aircraft (and therefore indirectly regarding unapproved parts) : the ICAO Continuing Airworthiness Manual[12], the ICAO Airworthiness Technical Manual[13] (examples of ICAO Technical Manuals) and ICAO Circular 95.

2. National Regulation

While the names of the specific approvals and certificates may differ in other states, to facilitate this study, reference will be made to the US and Candadian models of national regulation. In the US, the certifying body is the Federal Aviation Administration (FAA), invoking the standards of the Federal Aviation Regulations (FAR's).[14] In Canada the regulatory body is Transport Canada (TC), applying the Canadian Aviation Regulations (CAR's).[15] The following are the main types of regulatory approvals:

First, when a Prime Manufacturer designs a new aircraft, aircraft engine or propeller, it must

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[12] ICAO Doc. 9642 [hereinafter *CAM*].
[13] ICAO Doc. 9051 [hereinafter *Airworthiness Manual*].
[14] Contained in Chapter 14 of the US *Code of Federal Regulations.*
[15] Contained in the Canadian *Statutory Orders and Regulations*, 1996, at 433.

first apply for a Type Certificate[16] from the national aviation regulatory body. This certificate confirms that the proposed design comforms to the required airworthiness and other standards (such as noise restrictions). If the application is successful, an approval of airworthiness is then given to the aircraft's (or component's) Type Design[17] or its set of Design Standards, which will specify the parts, component materials, manufacturing procedures etc. to which all future copies of the aircraft or coponent must comply. On the other hand, if at any future stage, the aircraft manufacturer wants to produce a modified version of the aircraft (such as producing a stretched version with greater passenger capacity, but essentially still the same aircraft), he must apply for a Supplemental Type Certificate (STC). The next step a manufacturer generally follows before starting the production of an aircraft, is the securing of a Production Certificate. This certification process assures that the producer (who might not necessarily be the Type Certificate holder, since the aircraft may be produced under licence by another organization) is capable of meeting the Design Standards and other standards laid down in the country's regulations.[18]

The last step is that the manufacturer must obtain an Airworthiness Certificate for each finished aircraft before the aircraft can commence operations.[19]

Once the aircraft has been purchased, the Owner or Operator must also conform to certain standards with regard to the safe operation and maintenance of the aircraft.[20]

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[16] US, 14 C.F.R. s. 21B; Canada, SOR/96-433, s. 511.
[17] US, *Ibid* at s. 21.31.
[18] US, *Ibid.* at s. 21G.
[19] US, *Ibid.* at s. 21H; Canada, SOR/96-433, s. 507.02.
[20] US, *Ibid.* at s. 91; Canada, *Ibid.*, part VI. For example, parts produced by an aircraft owner for maintaining his own aircraft must conform to certain standards. US, *Ibid.* at s. 21K.

Repair Stations must also furthermore adhere to certain standards in the maintenance of aircraft.[21] The most important standard to be followed by Repair Stations is that "[e]ach person...shall do...work in such a manner and use materials of such a quality that the condition of the [aircraft or component] worked on will be at least equal to its original or properly altered condition."[22] Indeed, this means that a Repair Station may manufacture parts for installation on the aircraft it is servicing, provided they are of the same quality as those procured from an Original Equipment Manufacturer (OEM) or Parts Manufacturing Approval (PMA) holder. Nevertheless, the Repair Station may not sell these parts and may only manufacture them for direct installation onto an aircraft.[23]

The standards to which a manufacturer must comply when applying for a PMA in the US are contained in FAR Part 21, sub-part K. There is no process identical to the PMA in Canada, however. Under CAR 561, a parts manufacturer may gain approval to manufacture replacement parts, but this does not include authority to design such parts and a manufacturer must manufacture the parts according to the design of the OEM. To also design replacement parts, a manufacturer in Canada would have to go through the full design approval process contained in CAR's 511 and 513.

A further regulatory process used in the US, which is not used in Canada, is that of issuing Technical Standard Orders (TSO's).[24] These orders focus on designs for which the FAA has

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[21] US, *Ibid.* at s. 43; Canada, *Ibid.*at s. 571. In Canada, a Repair Station needs to apply to become an Approved Maintenance Organization (AMO) before commencing operations. Canada, *Ibid.* at s. 573. In the US this authorization to repair aircraft is called a Repair Station Certificate. US, *Ibid.* at s. 145.

[22] US, *Ibid.* at s. 43.13(b); Canada, *Ibid.* at s. 511.02(1).

[23] *Ibid.*

[24] US, *Ibid.* at s. 21O.

established a manufacturing standard (used for more or less standard parts such as aircraft landing gear, tires and brakes). Any organization which can prove that it is manufacturing according to a TSO may produce a part, without itself being certified beforehand. TSO'ed parts are more or less standard to all aircraft, but yet still specific to the aviation industry. For example, an aircraft tire could not be used on a motor car.

A special situation arises when certain standard parts on aircraft may be used not only for aviation products but also on other products. Examples of such parts are rivets and bolts.[25] These parts are called Standard Parts and do not have to conform to specific aviation standards to be used on aircraft, provided they conform to some other accepted industry's standards.[26]

A final national regulatory mechanism used are Bi-lateral Airworthiness Agreements[27] whereby states agree to recognize parts manufactured and certified in other states as airworthy as eligible for use and installation on aircraft in their own states[28].

To this point, Regulated Parts have been discussed, since they are subject by regulation to some

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[25] Further examples are what are sometimes referred to as 'commercial parts', such as torches and fire extinguishers. These are composite parts which have other uses outside of aviation. See *Interpilot, supra* note 5 at 10.

[26] US, 14 C.F.R. at s. 21K; Canada, SOR/96-433 at s. 571.13. In 1995, the FAA established a Task Force to review the problem of unapproved parts and to propose regulatory solutions. The report of the Task Force is presented as the *Suspected 'Unapproved Parts' Program Plan* (Washington DC : FAA, 1995) [hereinafter *SUPPP*]. The SUPPP defines a standard part as:

> [a] part included in the type design and manufactured in complete compliance with an established U.S. Government- or industry-accepted specification that includes design, manufacturing, and uniform identification requirements. The specification must include all necessary information to produce and conform the part...E.g. National Aerospace Standards.

Ibid at 3-8.

[27] US, 14 C.F.R. at s. 21N.

[28] As an example see the "Agreement between Canada and Italy on Airworthiness" (26 September 1997), http://www.tc.gc.ca/aviation/aircert/internat/baa/italy.htm (date accessed : 10 June 1998).

standard, contained either in an aircraft type design or in the regulations themselves. However, it is important to emphasize that not all parts installed on aircraft are Regulated Parts. For example, the earphones used in-flight entertainment systems are not Regulated Parts.

Furthermore, it is interesting to note that currently in he US, Distributors of aircraft parts do not require authorization in the way that, for example, a Repair Station needs a Repair Station Certificate in order to operate. The debate surrounding this issue will be discussed in full detail below.

The above regulations rely heavily on some form of documentation as proof of approval, although the term 'documentation' does not always refer to paper documents. In terms of aircraft parts, the following are examples of documentation: the manufacturer's identification of the part either engraved onto the part or on a plate attached to the part; a tag detailing maintenance by an approved Repair Station[29]; or accompanying paper documentation indicating the part's age and prior use.[30]

Adherence to the regulations is enforced mainly by inspection requirements and reliance is also on reporting of infractions by industry elements themselves.[31]

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[29] In the US, an example of this would be the well-known (or infamous) 'Yellow Tag' or FAA Form 81-30.

[30] See *infra* at 57 for a complete discussion on documentary proof of approved status of aircraft parts.

[31] See *infra* at 77 for a complete discussion of enforcement of regulation.

II. WHAT IS AN UNAPPROVED PART?

Without attempting a specific legal defintion at this stage,[32] an unapproved part can broadly be described as follows : a part, component or material that has not been manufactured or repaired in accordance with the processes prescribed by regulation. In other words, the part does not conform to an approved Type Design or aviation or other industry standard. From another perspective, (US) Air Transport Association Specification 106 defines an unapproved part as "[a] part that has not been approved/certified. It does not meet the tolerances, limitations and/or specifications delineated in its design data and/or which is not made from materials specified for that design. It is something different than what the original design calls for."[33] In general such parts may not be installed on Type Certificated products (ie. aircraft, powerplants or propellers).

There exists considerable debate, however, over whether so-called unknown or undocumented parts should be included among unapproved parts[34]. These are parts which *might* be approved, but their status as approved or not cannot be established since they have become separated from their documentation. The safety implication of installing parts which might or might not fail speaks for itself. Thus, this thesis proposes that these parts be included as unapproved parts and be forbidden for installation on Type Certificated equipment.

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[32] See *infra* at 53 for a complete discussion with regard to the legal definition of an unapproved part.
[33] *ATA Spec. 106, supra* note 7 at 4.
[34] See *infra* at 14.

III. SOURCES AND TYPES OF UNAPPROVED PARTS

A. Sources of Unapproved Parts

1. Counterfeit Parts

The FAA Suspected Unapproved Parts Program Plan (SUPPP) defines a counterfeit part as "[a] part made...so as to imitate or resemble an 'approved part' without authority or right, and with the intent to mislead or defraud by passing the imitation [off] as original or genuine."[35] It has been suggested that counterfeit parts may include misbranded parts, cosmetic doctoring, unapproved component parts located inside a part that appears approved, or a completely copied part. [36] Parts counterfeiters gain access to the data required for manufacture through industrial espionage or use simple copying processes.[37] For example, a relatively common process in the aviation parts industry is called reverse engineering, whereby an engineer who has a copy of a part can strip it or break it up and compose the technical drawings needed to produce the part. Counterfeit parts therefore include those manufactured by a manufacturer without a Parts Manufacturing Approval (PMA) or Technical Standard Order (TSO).

2. Undocumented Parts[38]

Another category of unapproved parts is undocumented parts. ATA Spec. 106 defines such parts

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[35] *Supra* note 26 at 3-9.
[36] Hedrick, *supra* note 4 at 124.
[37] *Interpilot, supra* note 5 at 11.
[38] Hedrick refers to these parts as "unknown" parts. *Supra,* note 4 at 128.

in the following way :

> [a] part or material is undocumented when documentation is not sufficient to establish:
>
> (1) [t]he part...was manufactured in compliance with [regulations];
>
> (2) [t]he part was previously determined to be airworthy by an appropriately rated certificate holder;
>
> (3) [t]he current status of a life limited part (e.g. accumulated hours/cycles and history).[39]

Examples of documentation according to this definition are the following : first, documentation identifying a part as having been manufactured according to regulations could be a manufacturer's identification plate riveted onto the part which sometimes may become detached. Second, an example of documentation attesting to the part having previously been "determined to be airworthy by an appropriately rated certificate holder" could be a tag showing that approved maintenance was carried out on the part (thus, if such maintenance is done without attaching the tag, the part becomes an undocumented part). Third, the documentation accompanying life-limited parts is usually a log-book. In the case of parts that have passed through several hands (ie. manufacturer, distributor, Repair Station, further Repair Stations[40] etc.), there is a 'paper trail' (receipts, bills of sale etc.) tracing all the transfers of the part 'back to birth'[41].

To reiterate, undocumented parts are parts which are *potentially* unsafe[42] and should

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[39] *Supra* note 7 at 1-14.

[40] Repair Stations sometimes share parts availability databases and might purchase or trade parts of which they are out of stock from other Repair Stations.

[41] See *supra* at 12 regarding documents which must accompany a part.

[42] See *Interpilot, supra* note 5 at 10. "...[T]here is no way of checking either their origin or their lifespan." *Ibid.* Luedeman, *supra* note 4 at 152, citing comments by C. Beach during *Unapproved Parts and Aviation Safety*, Hearings before Subcommittee on Oversight of Government Management of the [US] Senate Committee on Governmental, 104th Congress 2nd Sess. (1995). "...[T]here is no reliable basis for anyone to

accordingly not be eligible for installation on aircraft. There are currently many undocumented parts installed on aircraft and stored in parts warehouses across the world. This not only attributable to inadvertent separation of parts from their documentation. Undocumented parts also find their way onto aircraft when parts are installed without documentation, in the belief that they are not regulated parts[43] and subject to some sort of documentation requirement when in fact they are (for example parts of an aircraft's interior decoration which are indeed subject to stringent fire- and break-proof requirements[44]).

3. Stolen Parts

Employee theft of parts at airlines and manufacturers is a widespread problem.[45] According to one source, "[y]ou can easily steal engine components under your coat. And once they are out the door, they're nearly impossible to trace."[46] Also, aircraft parts have three major characteristics that make them prime targets for thieves : they are very expensive; they are relatively small and thus highly transportable; and a very active market for stolen parts exists. [47] Furthermore,

> [o]btaining them is easy - for two reasons : ...aircraft tend to sit on ramps at night, guarded by security systems primarily aimed at preventing people from entering the area without identification [and] people carrying identification, whether authorized, stolen, or fake can roam at will.[In addition,] until recently, the airlines were simply unaware

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conclude that a given part is airworthy or conforms to Type Design." *Ibid.*

[43] See *supra* at 11.

[44] See *Interpilot, supra* note 5 at 10.

[45] *Flight Safety Digest Jan/Feb '94, supra* note 5 at 5, citing H. Davidow.

[46] *Ibid.*

[47] D. Nelms, "Stolen Parts" [November 1991] Air Transport World 12.

that their parts could be stolen - or even that anybody would want to steal them.[48]

To sum up, the problem with stolen parts is that they are normally stolen without their documentation, and therefore become dangerous undocumented parts.

4. Salvaged Parts

Salvaged parts are a variation of stolen parts since they are not stolen from the warehouses of airlines or manufacturers, but are stolen from the wreckages of airline accidents or from aircraft which have gone out of service. In addition to the obvious problem of not having their proper documentation, these parts might be also damaged from the accident. The most well-known incidence of this phenomenon was the December 1995 crash of an American Airlines Boeing 757 in Columbia where thieves used helicopters to sling whole engines from the wreckage.[49]

5. Surplus Parts and Reject Parts

A third variation of the stolen parts phenomenon consists of reject and surplus parts.

Reject parts are those "which have been designated to be discarded by the manufacturer (or Repair Station) because quality control determined that they are not fit for aircraft use."[50]

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[48] *Ibid.* See also *Flight Safety Digest Jan/Feb '94*, *supra* note 5 at 5. Once components are stolen, they are replaced on the shelves with junked parts that are earmarked for scrap, making it difficult to detect the theft. *Ibid.*

[49] See "Plane Parts on Black Market Plague Airline Industry" (12 August 1996), http://www.lubbockonline.com/news/120896/plane.htm (date accessed : 13 May 1998) [hereinafter *Plane parts on Black Market*].

[50] Hedrick, *supra* note 4 at 124. See also *Interpilot*, *supra* note 5 at 11.

However, before they can be properly disposed of, they find their way out of the facility and onto the market.

Surplus parts are those parts which may be airworthy but were not subjected to proper inspection and verification after their production.[51] This is because manufacturers intentionally produce more parts than are ordered, in order to avoid having to start up the whole production line once more if parts prove to be faulty.[52] Manufacturers maintain a stock of these parts to be certified on order and before leaving the facility. However, in the meantime, if these parts are stolen, they become unapproved parts.

6. Military Parts[53]

Military parts are those which are approved for use on military aircraft. However, these parts may not also be necessarily approved for use on civilian aircraft. Indeed military parts may be similar, but not identical to their civilian equivalents. For example, military aircraft engines are not required to conform to the same noise rules as civilian engines. Military parts generally enter the civilian market after they become unserviceable. Such parts are supposed to be destroyed so that they are no longer usable in any form, but are not disposed of according to military regulations. This problem is illustrated by those military parts from the more than 6000 helicopters lost during the Vietnam War which are surfacing on the civilian market in

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[51] Hedrick, *ibid.*

[52] *Interpilot, supra* note 5 at 11.

[53] See Hedrick, *supra* note 4 at 123; R.Robinson, "Military Surplus Goods Fuel Bogus Parts Market" [1 March 1993] Av. Wk. & Sp. Tech. 14.

the US even today.

This problem is partly attributable to special circumstances. The US Department of Defense is required by the *Surplus Property Act*[54] to dispose of its surplus property; however, it is prevented from destroying property with any economic value. Aircraft parts, even when unserviceable, are considered to have economic value as scrap metal; consequently, many unserviceable military aircraft parts are sold rather than destroyed.[55]

Military parts also cause problems when they are indeed 'dual use' parts and eligible for installation on both military and civilian aircraft, but enter the civilian market without proper documentation detailing their prior histories.

7. Rebuilt/Overhauled Parts

The next source of unapproved parts are those which are the result of unscrupulous persons, either approved Repair Stations or otherwise, who obtain parts which have become unsuitable for installation on aircraft and cosmetically alter them to resemble new parts. Thus, they alter the part to hide defects from manufacture, use, age or crash damage.

There are three possible scenarios for these rebuilt or overhauled parts. The first involves the retouching of expired life-limited parts. The (US) Air Transport Association Specification 106

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[54] 50 U.S.C. App. 1601 *et seq.*
[55] *SUPPP, supra* note 26 at 6-15.

defines a life-limited part as a part that "has established replacement criteria, inspection intervals, or related procedures specified..."[56] Such procedures will be specified by the Design Standards of an aircraft as well as mandated by the regulations. There are three measures which standards use to limit the use of such parts : (1) time, expressed in hours of use installed on equipment in flight; (2) cycles (a cycle begins with take-off and is completed on landing); or (3) shelf life. Parts which have reached the end of their time or cycle limit are referred to as 'run-down' or 'cycled-out' and may differ from part to part in the amount of visible wear typically exhibited.

The second possible scenario for rebuilt or overhauled parts involves the renovation of 'scrap' parts. In contrast to expired life-limited parts, these are parts which have been physically damaged in some way to such an extent that they are deemed unrepairable. This could be the effect of normal or abnormal use or crash damage.[57] In what are colloquially referred to as 'strip-and-dip' operations, the flaws in these parts are then masked in order that they appear new. In short, the above two scenarios refer to parts that should be permanently removed from service since they have been illegally returned to service.

The third scenario to consider is when damaged but repairable parts are repaired by an unapproved Repair Station. These parts would also be considered unapproved overhauled parts since the possible danger lies in the uncertified and therefore possibly unsafe repairs performed

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[56] *ATA Spec. 106, supra*, note 7 at 1-7.

[57] See W.Stern, "Warning! Bogus Parts Have Turned Up in Commercial Jets. Where's the FAA?" [10 June 1996] Business Week 12. An example of parts damaged during normal use was a cracked and corroded compressor disk on a US airline's DC-9 engine which had simply been coated over by a Repair Station in Turkey, causing the engine to explode when the engine was revved-up on the ground. *Ibid.*

on them. Furthermore, the documentation describing repairs carried out which must accompany repaired parts can only be legally completed by an approved Repair Station; however, in the case of unapproved repairs, such documentation is either lacking or forged.

8. Standard Parts

The next source of unapproved parts refers to a specific Standard Part variety (such as a rivet,bolt or spring) which does conform to some industry's standard, but that standard is not a recognized substitute standard for aviation purposes.[58] However, an unscrupulous parts distributor could buy such a part legally anywhere, present it as a recognized standard part and its value would probably increase significantly.[59] The problem with standard parts is that outwardly, it is very difficult to tell the difference between a part that has indeed been manufactured in accordance with a recognized industry standard and one that has not. This difficulty often arises because of the size of the part. Indeed, while most aircraft parts are large enough to have at least a part number imprinted on them, some parts (for example rivets) may be too small to bear any marking at all. Thus, for example, it is difficult to tell the difference between a titanium rivet and a soft steel version[60].

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[58] See *supra* at 11.

[59] Kaiser, *supra* note 4.

[60] See J. Leggett , "Bogus Parts - Myth or Fact?" (Paper delivered at International Association of Air Safety Inspectors (ISASI) 1996 Seminar) (1996), http://www/awgnet.com/safety/Proceed1.pdf (date accessed : 20 June 1998) at 56. "Because the dimensions are small, it is challenging [to manufacturers] to develop unique identification means to prevent confusing customers about the source of parts...It is time for manufacturers to meet the challenges of identifying their products more specifically to avoid consumer confusion.". *Ibid* at 63.

9. Misused Approved Parts

Misused approved parts is the next source of unapproved parts. A recent article gives the following example : "[t]here are parts which have been adapted for use on completely different types of aircraft. For instance, a...brake center might convert a Boeing 747 brake disc into one for a DC-8."[61] The FAA, however, expressly excludes from the definition of unapproved parts an approved part which is used in the wrong application.[62] To use the descriptive definition of an unapproved part given above, such a part would however be "something different than what the original design calls for,"[63] and there are obvious safety implications of modifying parts or installing them in uses they were not designed for.[64]

10. Falsely Documented Parts

A falsely documented part is an unapproved part which, apart from its characteristics which are the cause of its unapproved status, is falsely presented as an approved part. This is mostly in the form of forged documentation[65]. Almost all of the above manifestations of unapproved parts will in practice be accompanied by false documentation in order to attract buyers.

What is also being referred to here, is a part which in all other aspects is airworthy, yet is

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[61] *Interpilot, Supra,* note 5 at 11.

[62] US, FAA , *Order 8120.10 Suspected Unapproved Parts Program* (Washington DC : FAA, 16 June 1997) at 5.

[63] *ATA Spec.106, supra* note 7 at 1-4.

[64] See *infra* at 24.

[65] The case of a Boeing supplier who in 1995 was convicted of falsifying Boeing inspection stamps on parts which he sold serves as an illustration of this form of unapproved part. See Leggett, *supra* note 60 at 56.

accompanied with forged documentation indicating a much shorter life. The safety imperative of being able to correctly ascertain a part's background and history has already been discussed [66] such that the same reasoning can be used to justify including falsely documented approved parts as unapproved parts.

B. Types of Unapproved Parts

To sum up, it can be said that all of the unapproved parts discussed above fall into two categories : sub-standard parts (for example, cheap counterfeit parts and patched-up crash damaged parts) and parts with documentary irregularities (such as undocumented or falsely documented parts).

Two points should be highlighted at this point. First, as mentioned already, most unapproved parts are accompanied by false documentation. Second, the sources of parts are often overlapping such that parts from specific sources may fall into more than one category. The significance of overlapping sources is that the combination of actions which occurred with respect to a particular part will determine how many possible defendants there will be and who they are. For example, military parts may be undocumented and/or requiring overhaul and/or falsely documented. In the same way a salvaged or reject part may or may not be a rebuilt part, depending on the extent to which their defects were visible or not.

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[66] See *supra* at 12; 14.

IV. SCOPE OF THE PROBLEM

A. Danger Posed to Aviation Safety

There is significant dispute as to whether unapproved parts pose a significant problem to the flying public. Indeed, some commentators consider the problem insignificant.[67] In fact a former FAA Administrator has gone so far as to state that "...there is no safety problem associated with undocumented parts;..., and we've never had an accident from a counterfeit or fraudulently documented part."[68]

A statistical review of the problem is helpful. Internationally, no records are kept on unapproved parts and in the US the number of accidents caused by unapproved parts is in dispute.[69] A study by the FAA of its accident-incident database [performed at the request of The Associated Press] found that unapproved parts played a role in 174 aircraft crashes or less serious accidents from May 1973 through April 1996, resulting in 17 deaths and 39 injuries. None of these crashes or accidents involved major commercial carriers.[70] While these statistics could not be verified,[71] accident statistics should not be used as an absolute indicator of whether

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[67] See *Plane parts on Black Market*, *supra* note 49, citing former FAA Administrator, D. Hinson.

[68] Schiavo, *supra* note 3 at 100, citing A.Broderick.

[69] Bajak, *supra* note 1.

[70] *Plane parts on Black Market*, *supra* note 49.

[71] A search of the FAA Incident Data System yielded reference to only 9 incidents involving unapproved parts between 1981 and 1997 in the US. http://nasdac.faa.gov/internet/fw_search.htm (date accessed : 20 June 1998). Enquiries to the NTSB showed that the NTSB aircraft accident database in turn contained reference to only 21 accidents in the US between 1984 and April 1998 which involved unapproved parts with 4 fatalities. E-mail from carterl@ntsb.gov (L. Carter, NTSB Aviation Accident Data Specialist Analysis and Data Division) to kingho_c@lsa.lan.mcgill.ca (Christopher J. Kinghorn) "Unapproved Parts as cause/factor" (received 15 June 1998) [hereinafter *NTSB Source*] . (One writer has stated, however, that the FAA convinced the NTSB to reclassify all incidents attributable to 'bogus parts' as attributable to 'maintenance-related problems' to hide the existence of the problem. Schiavo, *supra* note 3 at 101. However, Briefs of Accidents received from the *NTSB*

or not unapproved parts constitute a safety hazard or not. This is because it is "possible for an aircraft to suffer so much fire and impact damage that [one] couldn't tell if a[n unapproved] part was a factor [or not]".[72]

Unapproved parts have, however, caused several major aircraft accidents. The best known, and probably most serious, occurred on September 1989 with the crash of a Convair340/580 turbo-prop aircraft 10 miles off the Danish coast causing the death of all 55 people on board.[73] The Norwegian Aircraft Accident Investigation Board (AAIB) investigated the accident. Its report concluded that the tail structure of the aircraft had come loose in cruise flight at an altitude of 22 000 feet, causing loss of control and the subsequent crash into the North Sea.[74] The report stated that the vertical stabilizer was attached to the fuselage with "pins and sleeves that did not comply with the specified values for hardness and strength and were therefore not airworthy." This caused the pins to wear out prematurely and to shear off in flight. Another example of an accident attributable to unapproved parts was a crash off the island of Contadora near the western shore of Panama that killed 22 people.[75] This crash was caused by premature pitting and corrosion of fuel nozzles, which caused carbon build-up in the aircraft's engine, causing it to explode. Once again, these parts had been manufactured with a lower quality steel than required by the Type Design. Probably the most recent example was the crash of a Robinson R-22

Source, supra, do indeed contain references to the words 'bogus parts'. For example, on 08 December 1984 in Mountain Home, Idaho, USA, an accident was caused by a "bogus fuel filter". *Ibid.*) According to the Transportation Safety Board (TSB) of Canada's accident database, since 1977, 9 accidents in Canada have been caused by unapproved parts with 2 fatalities. Facsimile from J. Chadwick (TSB) to C.Kinghorn (received 28 May 1998).

[72] *Flight Safety Digest, supra* note 5 at 7, citing B. Loeb.

[73] "Fatal Convair Crash Linked to Suspect Parts, Improper Maintenance" [January/February 1994] Flight Safety Digest 18 [hereinafter *Convair Crash*].

[74] *Ibid,* citing Aircraft Accident Investigation Board (AAIB) of Norway, *Report on the Convair 340/850 LN-PAA Aircraft Accident North of Hirtshals, Denmark on September 8, 1989* (Oslo : AAIB, 1993).

[75] See Leggett, *supra* note 60.

helicopter near Opotiki, New Zealand in October 1995 causing two deaths[76]. The helicopter had been fitted with timed-out main rotor blades which had just been "re-skinned" to make them appear new. The blades cracked during flight, causing the helicopter to crash.

B. Extent of the Problem

This paper contends that unapproved parts do indeed pose a danger to aviation.[77] To put the danger in perspective however, consider the following statistics for the causes of aircraft accidents for the period between 1959 and 1994 : 64,4% - human factors; 15,6% - component failure; and 3.5% - defective maintenance.[78] Therefore, the failure of unapproved parts constitutes only a percentage of only 15.6% of all aircraft accidents over the above period. Indeed one commentator has stated:

> [unapproved] parts are certainly not routinely causing planes to plunge from the sky. Commercial airlines remain one of the safest ways to travel. From 1980 to 1992, according to the [US] National Safety Council, the fatality rate for people traveling by car, for example, was 37 times greater than the rate for people traveling on US scheduled airlines. *The real issue posed by [unapproved] parts is whether they are eroding the system erected by the industry and its regulators that produced that enviable record of safety.*[79]

Although the popular perception is that the problem of unapproved parts is a relatively recent phenomenon, the problem first surfaced in the 1950's. In 1957, the Flight Safety Foundation

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[76] See "Man Jailed Over Bogus Parts" [07 December 1998] The [Wellington] Dominion 7.

[77] According to General Electric Aircraft Engines, "[i]ndustry-wide, some forecasts suggest that one in three unapproved parts fail to meet minimum specifications, or run the risk of wearing out prematurely". (date unknown), http://www.ge.com/geae/worldwideengine/aewens3.html (date accessed : 15 May 1998).

[78] R.Sumwalt, "Integrating Human Factors : The Future of Accident Investigation" (26 January 1998), http://www.awgnet.com/safety/library/iassumw.htm (date accessed : 03 June 1998), citing International Society of Air Safety Inspectors (ISASI) statistics.

[79] Stern, *supra* note 57 [emphasis added].

published *The Problem of Bogus Parts* by Joseph Chase,[80] followed in 1964 by *Bogus Parts : A Continuing Threat to Safety in Aviation* by the same author.

Today, all elements of the aviation industry are involved in the trade in unapproved parts, including Repair Stations, Distributors, Manufacturers and Operators.[81] Furthermore, this is a worldwide problem with "parts made in basements, garages, and weld shops, or from major US manufacturers and from Germany, France, England, New Zealand, Canada, Japan, China, the Philippines, Taiwan...They [have] even showed up on the [US] President's helicopters and in the oxygen and fire-extinguishing systems of [his aircraft]."[82] Furthermore, unapproved parts in circulation today are from the total spectrum of part types. As a former US Department of Transportation official has stated : "[w]e would seize parts from every kind of aircraft : helicopter blades, brake components, engines, engine starters, fuel bladders, generators, bearings, speed drives, avionics, cockpit warning lights, landing gears, wheels, combustion liners, parts of helicopter tail rotors, windshields and entire wing and tail assemblies."[83]

The worldwide aircraft parts inventory is estimated at US$ 45 billion,[84] and the FAA estimates that 26 million parts are installed on aircraft per year[85]. Although there is a reluctance on the part of mature, responsible operators and Repair Stations to install unapproved parts, unscrupulous elements do exist who make such parts available. Moreover, smaller operators

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[80] *Flight Safety Digest Jan/Feb '94, supra* note 5 at 3.

[81] Hedrick, *supra* note 4 at 111, citing "Putting Bogus Parts on the Agenda" [April 1993] Aircraft Maintenance Magazine 4.

[82] Schiavo, *supra* note 3 at 99.

[83] *Ibid.*

[84] W. Maynard and P. Moak, "Repaired and Reconditioned Products in the Aviation Industry" (22 May 1997), http://www.bmpllp.com/970522/970522wm.htm (date accessed : 13 May 1998).

[85] Hedrick *supra* note 4 at 109.

and Repair Stations sometimes attempt to cut costs by buying cheaper but unapproved parts; and needless to say, responsible operators and Repair Stations also unknowingly sometimes install unapproved parts because of forged documentation. Suppose therefore, that only 2% of the parts installed yearly were unapproved, that would still amount to 500 000 unapproved parts installed on aircraft each year.

Statistics on the exact number of unapproved parts in existence are however uncertain. The FAA develops its statistics by relying not only on its own inspections, but also for the most part on reports from the industry. Since 1993 the FAA has received 1350 reports of unapproved parts.[86] Many parts owners are however reluctant to report unapproved parts. They often prefer to return the parts for refunds rather than give them up as evidence in prosecutions, so figures based on reports are not an accurate reflection. Nevertheless, an audit of parts bins at FAA-regulated Repair Stations by the US Department of Transportation's Office of the Inspector General (OIG), did reveal that as high as 43% of the parts they received from manufacturers were unapproved.[87] It should be noted that one further accurate statistic is that about $140 million worth of aircraft parts are stolen each year.[88]

C. Economic Effects

The negative effects of unapproved parts are not limited to aviation safety and the integrity of the system of aviation regulation. The existence of unapproved parts also has a negative

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[86] E. Marchak, "Arrow Air to Admit lying about flawed parts" [25 April 1998] Cleveland Plain Dealer.
[87] Schiavo, *supra* note 3 at 110.
[88] *Interpilot, supra* note 5 at 12.

economic effect on the aviation industry.

Trade in unapproved aircraft parts is certainly a very lucrative business for dishonest industry elements. For example, one company bought time-expired helicopter blades for about $100 each but sold them for $10 000 apiece (which was still only about two thirds the price of new blades).[89] Unapproved parts have to be offered at a certain price in order not to attract undue attention. A serious buyer expects to pay a relatively high price for an original part, or even a second-hand part with some life-span remaining.

The economic costs of the unapproved parts trade on the legitimate industry are quite serious.

> [They are] costing the aerospace industry between $500 million and $1 billion per day. These sums arise from loss of sales by the original supplier, loss of value for a part and revenue for a part owner, the cost of verifying parts, the liability for parts to a manufacturer or, and the cost of documentation.[90]

According to two other analysts, the following three risks arise :

> [f]irst, counterfeiters who misrepresent the condition of repaired and reconditioned parts are in direct competition with the manufacturers who also participate in the 'used' aircraft parts market. Second, counterfeit goods that fail to perform as well as the genuine article injure the goodwill of the manufacturer whose image is wrongfully sullied by the poor performance of the knock-offs. Third, the failure of mislabeled parts may subject the innocent manufacturer to substantial liability should a parts failure result in a crash.[91]

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[89] *Ibid.* There is also the famous instance of a former drug-dealer in Miami, USA, who had switched to dealing in unapproved aircraft parts because there was more money in it than selling drugs. See *Plane parts on Black Market*, *supra* note 49.

[90] S.Elliot, "Beating the Bandits" [2 November 1994] Flight International 36.

[91] Maynard and Moak, *supra*, note 84. See also D. Kiesel, "Battling the Boom in Bogus Goods" [March 1985] American Bar Association Journal 60. " The company is injured in terms of...lost sales - from the counterfeiter directly and from the consumers who got a poorly made products and switched to another brand." *Ibid* at 61.

The last economic implication to emphasize is that there are millions of parts currently in parts inventories which are undocumented parts.[92] A significant economic burden will arise to require simply that these parts be disposed of, or to implement a process of re-approving them.

V. FACTORS CONTRIBUTING TO THE PROBLEM

The unapproved parts problem has been around since roughly the 1950's and has grown significantly since then. Indeed a principle contributing cause to the rise of the unapproved parts problem was the abundance of surplus military spare aircraft parts which flooded the civilian market after Second World War.[93] The same thing occurred after the Vietnam War when parts from the more than 6000 helicopters that had crashed during that war began to appear on the US civil aviation parts market.[94]

Second, aircraft by their very nature are a contributing factor to the problem of unapproved parts. For example, a Boeing 747 has roughly 6 million parts and on some Boeing jets, those parts are supplied by more than 1500 different suppliers.[95] By the time an aircraft is 10 years old, many of its millions of parts parts will have been replaced five times or more.[96] This creates a huge worldwide annual turn-over of aircraft parts. This makes the worldwide aircraft parts market very difficult to police with many sources of unapproved parts developing. The problem is compounded by the fact that the average age of the world's aircraft fleet is increasing with

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[92] Beauclair, *supra* note 4.
[93] *Flight Safety Digest Jan/Feb '94, supra* note 5.
[94] *Ibid.* citing R. Robinson, "'Timed-Out' Vietnam-era Parts Should Not Be Allowed in US" [Fall 1993] Rotor 36.
[95] Schiavo, *supra* note 3 at 102.
[96] Stern, *supra* note 57.

the projected lifetime of some wide-bodied jets being as long as sixty years. Thus, as aircraft age, more overhauls are required thereby increasing the potential for the installation of unapproved parts. Furthermore, since manufacturers no longer manufacture certain parts, this encourages operators sometimes to look elsewhere for replacement parts. In any case, aircraft parts are particularly susceptible to illicit trade because of their high price, and as one author suggests,

> [e]conomic incentives to circumvent the established system of certification and oversight are provided by the fact that compliance with certification and oversight exponentialiy increases the cost of parts obtained through legitimate channels. The evader can offer the product at a much lower price because he or she is not burdened with high overhead and consequently does not need to recapture these expenses.[97]

Thirdly, airline deregulation has contributed to the problem. Empty coffers from ticket price-wars are forcing airlines to save money in any way they can.[98] Airlines are not only cutting personnel, including maintenance personnel, but also shortening turnaround time between cycles. Time on the ground has been reduced from two hours to less than twenty minutes in some cases. Thus already stressed maintenance crews have the additional burden of being vigilant to detect unapproved parts. Furthermore, unlike larger airlines which generally do their own maintenance and repairs, cash-strapped smaller airlines generally out-source their repair and maintenance work, making it difficult for them to properly control the parts installed on their aircraft.

A particularly good illustration of how attractive it is for financially troubled airlines to use

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[97] Luedemann, *supra* note 4 at 119.

[98] *Interpilot, supra* note 5. See also J.Ott, "Reform Issues, Cuts in Budget Rock FAA" [03 July 1995] Av. Wk & Sp. Tech. 29. "...[The] lack of effective controls in the market is at least partially responsible for the problem of unapproved parts." *Ibid.*

unapproved parts is the Convair which crashed off Denmark in 1989. The airline operating this aircraft had financial problems at the time of the accident and filed for bankruptcy soon after[99]. Indeed, the Norwegian AAIB report showed how the airline was using unapproved parts at that time :

> [d]uring the final few days before the accident...[the aircraft's] scheduled flight program had a negative effect on its maintenance program. [The airline's] strong desire to complete as many flights as possible resulted in a delay in the correction of reported faults. The reason may have been the operator's critical financial condition.[100]

A further special situation contributing to the increased use of unapproved parts is that certain new and stricter rules regarding the operation of aircraft mean that a large number of parts which were otherwise serviceable must now be replaced by airlines. This is evidenced by the fact that at least one airline has already tried to cut corners with unapproved parts in hush-kitting its engines.[101]

Last, the recent commendable and considerable effort by US authorities to combat the problem has not resolved this issue because of the accumulated results[102] of the initial lack of strong enforcement in the US.[103] This has had an effect on the rest of the world, since about 80% of the world's second-hand parts come from the US.[104]

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[99] See *Convair Crash, supra* note 73.

[100] *Supra,* note 74.

[101] W. Stern, "Questions in the Air" [11 March 1997] The Nashville Scene A1.

[102] See Schiavo, *supra* note 3 at 90 *et seq.*

[103] *Interpilot, supra* note 5 at 12.

[104] *Ibid.* Especially from Miami, which is where scrapped aircraft such as those from Pan-Am and Eastern Airlines are kept. These parts can also end up in European aircraft through so-called spares pools, because when spares are needed, it is common practice for airlines to help one another out at short notice, so that companies do not have to hold spares of their own all over the world. *Ibid.*

CHAPTER 2

LEGAL REGIME - INTERNATIONAL LAW

I. INTRODUCTION TO THE LEGAL REGIME SURROUNDING UNAPPROVED PARTS

The discussion up to this point suggests that the problem of unapproved parts needs attention because of three reasons. First unapproved parts pose a threat to aviation safety. Second, they are a threat to the integrity of the current system of aviation regulation. Third, they have a negative economic effect on the aviation industry.

As has been stated before, legal means are only one of the means that may be applied to combat the problem. Indeed not all aspects of the problem may be solved by legal mechanisms. Certain problems must be solved by engineers, such as resolving the difficulty of marking small aircraft parts or reducing the high cost of designing and manufacturing aircraft parts. Nevertheless, the law has a reinforcement role of not only mandating effective technical solutions once they are developed but also effectively deterring the dishonest industry elements who participate in the trade in unapproved parts. Furthermore, the law may be applied to settle the tensions between dishonest and legitimate industry elements as well as third parties who have been injured because of the use of unapproved parts.

The ideal legal regime to combat unapproved parts should combine international and national legal mechanisms with two main purposes : firstly, to contribute to checking the spread of unapproved aircraft parts and eliminating them from the aviation industry; and secondly, to

equitably control the effects of such parts on the relationships among private persons. Thus, the implementation of these purposes is at two levels : at the international level, where the actions of states in combating the problem are controlled and where elements to be included by states in their national legal regimes against unapproved parts are prescribed[105]; and at the national level through the vehicles of national administrative, criminal and private law.

II. ELEMENTS OF AN EFFECTIVE LEGAL REGIME

At the international level the following elements should be prescribed for inclusion in a national regime to combat unapproved parts :

- The problem should be clearly defined with a clear all-encompassing legal definition of 'unapproved parts' which addresses all the possible sources and classifications of unapproved parts[106] (ie. **define the problem**);

- All possible activities in the chain of production, distribution, installation, prevention, etc. of unapproved parts should be prohibited and actions to prevent the occurrence of these parts prescribed as necessary (to **eradicate the problem**). Thus should be in legislation or regulation which is binding, explicit (ie. addressing unapproved parts specifically and not generally under other regulation) and supported by effective

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[105] See Hedrick *supra* note 4. Many of the world's aircraft are manufactured in relatively small number of countries and while these countries tend to address the problem, there is "very little guidance and no hard assurances that all countries will take a firm stance against unapproved parts." *Ibid* at 124.

[106] See *supra* at 14.

sanctions and enforcement mechanisms (such as inspections, powers to seize offending parts etc.);

- **The escalation of the problem must be prevented** through effective means such as parts databases, training programmes, seminars, etc.

- Effective legal mechanisms and principles must be developed for **dealing with the effects of the existing problem.** This would, for example provide compensation for damage caused by the failure of unapproved parts.

At this point, it is important to highlight a key question : to what extent do existing international instruments effectively contain and prescribe the above elements to states for inclusion in their national anti-unapproved parts legal regimes?

III. INTERNATIONAL AVIATION REGULATION

A. The Chicago Convention and its Regulatory Regime

International aviation regulation is currently by means of the Chicago Convention,[107] its Annexes and ICAO publications.[108] It should be emphasized that the problem of unapproved parts is not addressed explicitly by any of these instruments. There are nonetheless several

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[107] *Supra* note 11.
[108] See *supra* at 8.

provisions throughout them which indirectly address the elements of the regime proposed above.

The only article in the Chicago Convention itself which might be interpreted as addressing states' actions regarding unapproved parts is Article 31. This article requires states to issue airworthiness certificates for aircraft under their jurisdiction. This is an example of a measure requiring states to take actions to ensure that no unairworthy (or unapproved) parts are installed on aircraft. Annex 8 (Airworthiness) to the Chicago Convention also contains certain directives to states regarding their actions in combating unapproved parts. This Annex states in Part II at Chapter 2.2 that "[n]o state shall issue an airworthiness certificate unless the aircraft complies with a comprehensive and detailed...*airworthiness code* established for that class of aircraft" [emphasis added]. This airworthiness code shall comply with the standards contained in Annex 8's Part III. These standards pertain to the aircraft's design and construction (Chapter 4); engines (Chapter 5); propellers (Chapter 6); powerplant installation (Chapter 7); and instruments and equipment. These standards are an indirect international definition for states of what an unapproved part is. In addition, Part III of Annex 8, in Chapter 4.1.5 prescribes that "adequate provision shall be made to permit any necessary examination, replacement, or reconditioning of parts of the aeroplane which require such attention, either periodically or after unusually severe operations." This is an example of an international provision requiring states to prescribe measures to prevent escalation of the problem of unapproved parts.

Furthermore, Annex 6 to the Chicago Convention (Part 1 - Operation of Aircraft) also contains

some provisions indirectly prescribing states' actions in combating unapproved parts. In Chapter 8 (Aeroplane Maintenance) at 8.2, Annex 6 prescribes that states require of aircraft operators to have a Maintenance Manual which must contain procedures for servicing and maintenance of their aircraft. Furthermore, Chapter 8.4 of Annex 6 requires that operators ensure a system of inspection be implemented to "ensure that all maintenance, overhaul, modifications and repairs which affect airworthiness, are effected as prescribed in the Maintenance Manual or otherwise as made mandatory by the State of Registry."[109] Lastly, in Chapter 8.8 Annex 6 requires that operators ensure that maintenance records are kept, with special reference to recording total time in service of life limited components. These provisions of Annex 6 are examples of states being required to implement measures to prevent the escalation of unapproved parts.

The ICAO Continuing Airworthiness Manual (CAM)[110] also contains several provisions regarding states' actions against unapproved parts. The CAM requires that states ensure that Repair Stations carry out "Quality Assurance Audit Procedures".[111] Lists of checks which should be carried out during these procedures are prescribed.[112] Among these are checks relevant to unapproved parts, which include, for example, checks on aircraft while undergoing scheduled maintenance for compliance with manufacturer's and Repair Station's specifications. Also,

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[109] Most of the international aviation documents under discussion here rely heavily on action by an aircraft's State of Registry. This would seem to complicate matters in the light of the modern reality of leasing and other aircraft financing mechanisms whereby increasingly the state of the operator of an aircraft is different from the state where it is registered. However, in this regard, it is heartening that the amendment of the Chicago Convention by the insertion of article 83*bis* (allowing the transfer of certain regulatory functions from the state of registry to the state of the operator) finally entered into force in late 1997.

[110] *Supra* note 12.

[111] *Ibid* at Part IV (The Aircraft in Service - Maintenance Requirements and Their Accomplishment), Chapter 2 (Approved Maintenance Organizations), Section 3 (Quality management).

[112] *Ibid* at Part IV (The Aircraft in Service - Maintenance Requirements and Their Accomplishment), Chapter 2 (Approved Maintenance Organizations), Appendix A to Chapter 2.

checks should be done on:

> ...procedure[s] for examining incoming component materials and items for conformity with order, release documentation and procurement from sources approved by the [Repair Station]; labeling procedures, including the use of serviceable/unserviceable/repairable labels and their certification and final disposal after installation...;[and] labeling procedures for components which are serviceable but 'part life' only...[113]

These provisions of the CAM are examples of international measures contributing to preventing the escalation of the unapproved parts problem.

Furthermore, the CAM contains guidelines regarding procedures for reporting of aviation faults (which contributes to the policing of the unapproved parts problem). Annex 8 to the Chicago Convention, in Part II, Chapter 4.2.6, requires that states have a system for the transmittal of "information on faults, malfunctions and other occurrences" by operators to the states under whose jurisdiction their aircraft fall. In addition, Annex 8 prescribes that there should be systems for the transmittal of this information by those states to the state of design of the aircraft (Chapter 4.2.4) and subsequently by the state of design to other states which also have aircraft of that type under their jurisdiction (Chapter 4.2.2) so that they can implement any corrective actions if necessary (Chapter 4.2.3). Part VI (Exchange and use of Continuing Airworthiness Information) of Chapter 1 of the CAM contains guidelines for the implementation of these reporting provisions of Annex 8.

Additionally, the ICAO Airworthiness Technical Manual,[114] Part II, Section 1, Chapter 3, lists

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[113] *Ibid.*
[114] *Supra* note 13.

examples of "faults, malfunctions and other occurrences" which should be reported under the above reporting provisions of the Convention's Annex 8. This is only in a general fashion and only the following broad categories of occurrences are listed as examples : damage to aircraft structure; malfunctions and failures of aircraft engines, systems or equipment; and faults, malfunctions, and defects of control hardware that result in control problems of an aircraft in flight. However, the Manual does state that "[i]t is important to recognize that judgement be exercised by he reporter to distinguish those faults, malfunctions, defects, and other occurrences that might adversely affect continuing airworthiness from those that would not."

The last document under the international aviation regulation regime relevant to states actions in combating unapproved parts is ICAO Circular 95 (The Continuing Airworthiness of Aircraft in Service). This is a collective description of several Contracting States' reporting and transmittal procedures of airworthiness-related information.

B. Evaluation of the Chicago Convention Regulatory Regime

There are a number of limitations in the international regulatory framework established under the Chicago Convention.

The first problem is that only the Convention itself is binding on the current 185 contracting states. The Standards and Recommended Practices (SARP's) contained in the Annexes are not binding and it is worthwhile to consider the current level of states' compliance with the SARP's. Although article 38 of the Chicago Convention constitutes a binding duty on states to implement

the contents of the SARP's and at least to file differences with ICAO when they cannot, many states ignore this duty.[115] Indeed, not even ICAO knows which states actually have complied with which SARP's.[116]

In order to remedy this situation, several initiatives are currently in progress to assess the level of implementation of international aviation safety rules by states. First, there is the ICAO Safety Oversight Programme.[117] This currently only focuses on states' implementation of Annexes 1 (Licencing of Personnel), 6 and 8 to the Chicago Convention. It relies on states giving permission to be assessed and the results of the assessments are confidential.

Secondly, there is the European Civil Aviation Conference / Joint Aviation Authorities' Safety Assessment of Foreign Aircraft (SAFA) Programme.[118] Whereas the ICAO initiative is an assessment of states themselves, the SAFA programme constitutes inspections or 'ramp checks' of individual aircraft, with special emphasis on aircraft operated by charter airlines or airlines from third world countries.

The third initiative is the US FAA's International Aviation Safety Assessment (IASA) Programme.[119] This is similar to the ICAO programme in that it is an assessment of a state's government department of civil aviation to examine the state's implementation of the Chicago

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[115] T. Murphy, "Safety Oversight" [September 1995] Interpilot 17.

[116] M.Milde, "Enforcement of Aviation Safety Standards - Problems of Safety Oversight" (1996) 45 *Zeitchrift für Luft- und Weltraumrecht* 1 at 3.

[117] See "ICAO Sets Up Safety Oversight Programme" [28 October 1994] The Air Letter 1.

[118] See "Measures to Improve Aviation Safety" (20 February 1998), http://www.bmv.de/luftgb.htm (date accessed :28 May 1998) [hereinafter *Measures*].

[119] See Milde, *supra* note 116; L. Blattner, "Restoring Public Confidence in the FAA's Aviation Safety Oversight" (February 1997) Air Line Pilot 34.

Convention and its Annexes. If a state is found lacking in this regard, it is blacklisted with the effect that aircraft from that country are forbidden to fly to the US.

Fourth there is a further initiative through the Asia Pacific Economic Co-Operation (APEC)'s Group of Experts on Aviation Safety and Assistance (GEASA). Fifth, there is also an ICAO initiative for the establishment of a regional programme in Latin America, the Caribbean and Asia and Pacific for the development of operational safety and continuing airworthiness on a regional and co-operative basis.

Lastly, it should be mentioned that it has also become a practice to include Aviation Safety Clauses in Bi-lateral Air Transport Agreements.[120]

Although all of the above initiatives eventually concentrate on implementation of the ICAO Standards and Recommended Practices, a major drawback is that there is no globally co-ordinated, effective programme. Thus, the following questions can still be raised. Must assessment of airlines and individual aircraft or of government departments of civil aviation (what about cases where a state does not have a department of civil aviation, but is a signatory of the Chicago Convention?)? Should all Standards and Recommended Practices be assessed (and not just Annexes 1,6 and 8 to the Chicago Convention, as is currently the case)? Should submission to assessment by states be mandatory? Should results of the assessment be kept confidential? And who should fund assessments?

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[120] *Measures, supra* note 118.

The most concrete effort to addressing these questions with a globally co-ordinated programme was presented by the Directors General of Civil Aviation Conference on a Global Strategy for Safety Oversight held in Montreal, Canada in November 1997. This Conference published a report[121] in that same year which made several recommendations. One recommendation is that ICAO should explore viable and sustainable solutions to overcome difficulties faced by states.[122] For example it suggested that the ICAO Council and Assembly consider the allocation of adequate financial resources for this problem.[123] A second recommendation is that regular, mandatory, systematic and harmonized safety audits should be introduced. These audits would include all contracting states and would be carried out by ICAO.[124] The third recommendation is that reports of audits should be disseminated to all states although assessed states should first have reasonable time to remedy deficiencies before such information would be distributed.[125] These recommendations must, however, be qualified by the reality that this Conference is not a constitutional body of ICAO such that none of its decisions are therefore binding on ICAO or its member states. Nevertheless, its recommendations should not be ignored outright since its delegates had the advantage of being specialists from the actual world of aviation and not diplomats, as are the members of many of ICAO's other bodies.

In addition to Standards and Recommended Practices, ICAO Technical Manuals and Circulars are also non-binding and depend upon voluntary compliance by states.

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[121] ICAO Doc. 9707.
[122] *Ibid* at 2-2.
[123] *Ibid* at 2-3.
[124] *Ibid* at 2-5.
[125] *Ibid.*

A second limitation is that the Chicago Convention and its related material, do not directly address the problem of unapproved parts and merely indirectly require of states to implement some of the regime elements proposed.[126] For example, the standards in the Chicago Convention's Annex 8, Part III, describing airworthiness of certain aircraft parts may be construed as decribing *approved* parts and would contribute to a definition of unapproved parts. Also, the directives to Repair Stations in Annex 6 and in Part IV of the CAM may be interpreting as prohibiting Repair Stations from installing or purchasing, unapproved parts, thereby contributing to eradication of unapproved parts. Moreover, the extensive reporting requirements in Annex 8, the CAM and the Airworthiness Technical Manual if implemented by states would also greatly contribute to preventing the problem of unapproved parts from growing. Nevertheless, it is important to reiterate that there is no single, binding international legal document which contains all of the elements of the proposed anti-unapproved parts legal regime.

C. Proposals

As alternative approaches to improve the regulatory regime under the Chicago Convention, the following could be considered. The ideal option would be ratification of a new binding document at the international level specifically regarding unapproved parts. However, unfortunately it may be too far-fetched to expect a separate international treaty on this subject[127] and the subject would seem to be too specific for explicit inclusion in the Chicago Convention

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[126] See *supra* at 34.

[127] Although, quite recently aviation treaties have indeed been concluded on subjects which statistically would appear to far less of a widespread problem than unapproved parts. See for example the *Convention on the Marking of Plastic Explosives for the Purpose of Detection*, 1 March 1991, 30 I.L.M. 721

itself.[128]

A second and more realistic alternative would be to amend the Annexes to the Chicago Convention[129] to address all the elements of the proposed regime explicitly in the form of Standards and Recommended Practices.

In the light of the difficulties regarding adherence to the Chicago Convention and its Annexes outlined above however (in addition to the practical realities of amending these documents), it is suggested that the quickest and easiest alternative to address the problem of unapproved parts in terms of international aviation material would be for ICAO to publish a Technical Manual on the subject. A problem such as this should be well within the scope of such a publication, since manuals have previously been published on subjects as specific as, for example, "the prevention of problematic use of substances in the aviation workplace."[130] The legal basis for the publication of Technical Manuals is Article 54(i) of the Chicago Convention in terms of which it is a "[m]andatory function of the [ICAO] Council...to publish information relating to the advancement of air navigation and the operation of international air services." The Council would do this by referring the subject of unapproved parts to its Air Navigation Commission since it has the duty to advise the Council concerning the collection and communication to

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[128] In any event, amending the Chicago Convention as a means to solving a problem, does not seem to be an effective solution at all. Consider for example that the amendment of the Chicago Convention by inserting article *3bis* (something as directly affecting aviation safety as banning the use of weapons against civil aircraft) which was signed in 1984 still has not entered into force fourteen years later.

[129] According to article 90 of the Chicago Convention, this requires a two thirds majority vote by the Council and is more attainable politically than the high number of ratifications (more than 100) required for amendments of the Convention itself.

[130] "ICAO Manual on the Prevention of Problematic Use of Substances in the Aviation Workplace", ICAO Doc. 9654.

contracting states of all information which it considers necessary and useful for the advancement of air navigation.[131] It is stressed however, that the publication of a Technical Manual on unapproved parts, would be an interim step and that the ideal of binding international instruments explicitly addressing this problem would remain.

IV. INTERNATIONAL ANTI-COUNTERFEITING REGULATION

The counterfeiting of aircraft parts is a problem of international proportions. The broad international dimension of the problem is not only because the parts are being installed on aircraft across the world, but also because the parts originate from different countries.

Trademark counterfeiters outside of the industrialized nations profit from both an unprecedented technological ease of duplication and an enormous worldwide demand for their products which can be offered at lower prices due to the avoidance of research and development, licencing and advertising costs in their countries.[132] Furthermore, according to one author, trademark counterfeiters based in third world countries provide a substantial and vitally needed boost to the economies of those countries, which are consequently reluctant to enact or vigorously enforce laws protecting individual property.[133] This point becomes clearer by considering the following example from the aviation field : there is the well-known case of a third world manufacturer who was in the practice of putting Pratt and Whitney identification plates and part

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[131] Chicago Convention, *supra* note 11 at article 57.

[132] Maynard and Moak, *supra* note 84.

[133] J. Sweeney, "Heading Them Off at the Pass; Can Counterfeit Goods be Stopped at the Counterfeiter's Border?" [1984] Trademark Reporter 478.

numbers on engines that were manufactured by a different manufacturer.[134]

Thus, the question that should be addressed is : to what extent are states compelled by international law to ensure that such counterfeiting of aircraft parts is not carried out in their territories or by their nationals? There is in fact a recent and very effective international instrument on the subject, namely the Agreement on Trade-related Aspects of Intellectual Property Rights (the so-called TRIPs Agreement) which forms part of the General Agreement on Trade and Tariffs (GATT) framework.[135] This is the most ambitious international intellectual property convention ever attempted. The breadth of subject matters comprising the intellectual property to which it affords certain minimum standards of protection is unprecedented (as is the obligation of contracting states to guarantee that detailed enforcement procedures as specified in the agreement are implemented under national laws).[136] This subject matter specifically includes the following subjects relevant to aircraft parts : "industrial designs", "patents" and "integrated circuit designs."[137] Part I of the TRIPS Agreement requires states to adopt the minimum standards of protection for these subjects detailed in Part II of the Agreement and in articles 1 to 19 of the Paris Convention.[138]

Furthermore, the TRIPS Agreement imposes an obligation on states to extend protection to

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[134] Legget, *supra* note 60.

[135] *Agreement on Trade-related Aspects of Intellectual Property Rights,* 15 April 1994, reprinted in GATT Secretariat, *The Results of the Uruguay Round of Multi-lateral Trade Negotiations - The Legal Texts 1 to 19* (Paris : GATT Secretariat, 1994).

[136] J. Reichmann, "Compliance with the TRIPs Agreement : Introduction to a Scholarly Debate" [May 1996] Vanderbilt Journal of International Law 363.

[137] *Ibid* at note 12.

[138] *Paris Convention for the Protection of Industrial Property*, 20 Mar 1883, 828 U.N.T.S. 305. See P. Heald, "Trademarks and Geographical Indications : Exploring the Contours of the TRIPs Agreement" (May 1996) Vanderbilt Journal of Transnational Law 635 at 638.

foreign intellectual property rights. The basis of this obligation is that a state must extend the same augmented rights to non-nationals of other contracting states as it does to its own nationals.[139] Moreover, the Agreement now grants states a further weapon such that "[s]tates will [be able to] lodge actions against other states before duly constituted international bodies, with a view to vindicating the privately-owned intellectual property rights of their citizens against *unauthorized uses that occur outside domestic territorial jurisdictions.*"[140]

V. INTERNATIONAL PRIVATE LAW REGULATION

The following scenario is conceivable : an aircraft part was designed in one state, its design approved in another state, and the part manufactured in yet a third state. Its distribution occurred in a fourth state, while the aircraft in which it was installed crashed in a fifth state, where the part was stolen from the wreckage and rebuilt. Regardless of the rules of choice of law to be followed (in other words the rules to determine which of the five states' courts have jurisdiction over the matter), even once a forum (or fora) has been established, the area of law most often encountered in unapproved parts cases is product liability and national product liability laws applied from state to state differ vastly. The same set of facts could lead to widely differing verdicts and damage awards in two different states' courts.

The most significant attempt at solving this uncertainty was the Hague Convention.[141] This treaty has the following advantages : "it contains a multinational set of choice of law rules based

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[139] Heald, *ibid.*
[140] Reichmann, *supra* note 137 at 367 [emphasis added].
[141] *Convention on the Law Applicable to Product Liability*, 21 October 1972, 11 I.L.M. 1283

on recognizable connectors which provide common unambiguous selections of applicable law for most situations; it is forum neutral and thus antithetical to forum-shopping; it eschews preferences for substantive outcomes and so is party neutral; *and it seeks the application of a single law on all issues.*"[142] However, in 1993, after twenty years, this convention had only eight ratifications and three signatures, so is largely ineffective.[143]

The most successful other venture to introduce a single law on product liability has been the European Product Liability Directive,[144] although this is restricted to the fifteen states of the European Union.[145]

The above only addresses the unification of international product liability laws. As will be seen later,[146] other private law questions are also likely to arise where unapproved parts are concerned. The question of the international harmonization of private law at large (and not just regarding product liability) must also therefore be addressed.

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[142] *Contemporary International Law Issues : Oppurtunities at a Time of Momentous Change (Proceedings of the Second Joint Conference of the American Society of International Law and the Nederlandse Vereniging van Internationaal Recht)* (Dordrecht/Boston/London : Marthinus Nijhoff, 1993) [hereinafter *Proceedings*] at 319 [emphasis added]. See generally also Tebbens, *supra* note 5 at 333. Other recent initiatives on the subject which might serve as models for future attempts at harmonizing the subject are the Complex Litigation Project (CLP) of the American Law Institute and article 3345 of the Louisiana Civil Code (both US initiatives). *Proceedings, ibid.*

[143] *Ibid.*

[144] See EU, *European Product Liability Directive 85/374 of 25 July 1985,* O.J. Legislation (1985) No. 210/29.

[145] Even though, this Directive is self-executing and European member states are compelled to make it part of their national law, several members still retain a separate, additional product liability regime.

[146] See *infra* at 103.

CHAPTER 3

NATIONAL LEGAL REGIME - INTRODUCTION

As can be seen from the preceding discussion of the framework of international regulation unapproved parts, some of the elements of the proposed anti-unapproved parts regime are missing respecting what states should incorporate in their national legal regimes against unapproved parts. The following discussion will however assume that such an effective international regime is in place in proposing a national legal structure for implementing it. To serve as illustration and to contribute to an examination of the feasibility of the proposed elements, where current US and Canadian national law reflect these elements, their provisions will be discussed as examples.

In the same way that the legal regime surrounding unapproved parts can be divided into international and national regimes, national implementation of the elements prescribed at international level also occurs at two levels : action by national authorities (not only in *incorporating* the elements into the national regime, but also in the subsequent *application* of them) and action by private persons. Thus firstly, in the Public Law sphere, action is taken by the national authorities of a state with the aim of checking the spread of and eradicating the existence of unapproved parts. Second, at the Private Law level, action taken is by private persons against other private persons with the aim of controlling the effects of the existence of unapproved parts. Naturally, the successful use of private law remedies by private persons against those who have infringed on their rights through unapproved parts will also contribute to checking the spread of and eradicating unapproved parts, by serving as a deterrent to

dishonest industry elements.

However, the use of private law mechanisms against unapproved parts is not only the domain of private persons. The national authorities of a state also have a duty to ensure that effective causes of action and remedies do indeed exist in their national private law and that equitable means of hearing and enforcing them are provided.

CHAPTER 4

NATIONAL LEGAL REGIME - PUBLIC LAW

I. TRANSPORTATION/AVIATION REGULATORY REGIME

The national public law regime can also further be divided into two separate fields : a Transportation/Aviation Regulatory Regime and a Non-Aviation-specific Criminal Law Regime.

The law under the transportation/aviation regulatory regime is contained in binding legislation and regulations and in non-binding advisory material. Binding provisions are either general (indirectly, and not explicitly addressing unapproved parts, such as provisions prescribing parts certification processes, repair stations' actions, etc.) or specific (for example, a regulation explicitly stating that it is prohibited to manufacture counterfeit parts). The ideal is that the general provisions should address as many of the elements of the anti-unapproved parts regime as possible. However, there must be specific provisions to supplement the general provisions where loopholes or uncertainty might exist.

Alongside the binding regulation, examples of advisory materials would then be manuals, notices, advisories, directives, plans, training programmes, etc. designed to facilitate and explain the implementation of the binding material.[147]

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[147] This is analogous to ICAO's use of Technical Manuals to explain the SARP's. See *supra* at 37.

There exists considerable debate over the question of to what extent there should indeed be explicit proscription of activities in connection with the trade in unapproved parts in the aviation regulatory regime. This dispute arises because many of these acts already constitute criminal conduct under the broader criminal law. The argument is, for example, that to explicitly prohibit the marking of aircraft parts with false part numbers is unnecessary duplication of law since this is already a prohibited act, constituting fraud under criminal law. [148]

In fact, as will be seen below, the US regulatory regime in its current state does not explicitly include a great deal of the proposed anti-unapproved parts regime; however, criminal prosecution of manufacturers of and dealers in unapproved parts has nevertheless been extensive in that country. [149] From the early 1990's to 1995, the Office of the Inspector General (OIG) of the US Department of Transportation handled more than 250 cases which resulted in 172 indictments; 132 convictions; and penalties totaling seventy-two years in prison and 266 years probation. [150] The position of this paper is however that there remains an argument for addressing these actions in an aviation regulatory regime over and above the existing criminal law regime. The reason for this position is because the law governing many of the criminal acts surrounding unapproved parts has already developed over a considerable period of time and may not always take into account the specific characteristics of aviation-related criminal acts. An example of this would be that many of the criminal acts which cover unapproved parts activities require specific intent as the necessary form of fault. However, as will be argued

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[148] Luedemann, *supra* note 4 at 154.

[149] Hedrick, *supra* note 4 at 11, citing "Aerospace Laureates" [29 January 1996] Av. Wk. & Sp. Tech. 19.

[150] *Ibid.* See also Marchak, *supra* note 86.

below, general intent or negligence should suffice when it comes to unapproved parts.[151] Moreover, procedural rules (such as the power for authorities to seize offending parts) and penalties in terms of existing criminal law might be found lacking for the purposes of unapproved parts. For example, the law governing the crime of fraud might prescribe a fine or jail sentence, while remaining silent on whether the Repair Station who misrepresented an aircraft part should lose its Repair Station Certificate or not. Therefore it is suggested that to explicitly address the actions surrounding unapproved parts in aviation regulation is not unnecessary duplication and that existing criminal law continue to be used to supplement such a regime where it exists.

There are four issues which an effective national transportation or aviation-specific regulatory regime against unapproved parts must address : a clear, explicitly drafted *legal* definition of an unapproved part; explicit prohibition of all possible activities in the chain of manufacture, distribution and installation of unapproved parts; effective mechanisms to enforce these proscriptions; and effective, proactive prevention mechanisms to contain the problem.

A. Legal Definition and Identification of Unapproved Parts

It is essential to outline a single and comprehensive legal definition of an unapproved part, since without such a definition, it is impossible to exactly control the actions and activities related to them. As the US Federal Aviation Administration's Suspected Unapproved Parts Program Plan (SUPPP) states : "[c]lear and consistent use of terminology would help aviation

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[151] See *infra* at 63.

industry manufacturing and maintenance personnel, and...inspectors and engineering staff determine what parts are eligible for installation on aircraft".[152]

Currently, US regulations fail even to define what an *approved* part is. Instead, this is done indirectly in that a part as is described as *acceptable* or *eligible* for installation according to those separate sections of the regulations which address the part's manufacture and maintenance. The US Federal Aviation Regulations (FAR's), Part 1, do refer to a part being "approved" when it has gone through an active act of approval (such as inspection or testing with subsequent certification), but some parts are eligible for installation on an aircraft without ever having been through such a process. Examples are standard parts or parts manufactured by a Repair Station for installation.[153] Moreover, some parts might have been "approved" according to FAR Part 1, but would not be eligible for installation, such as a timed-out part. The effect of the above is that confusion exists over what an approved part is.

Neither is the term *unapproved* part defined anywhere in the US regulations. This, together with the further uncertainty created by the use of the colloquial term 'bogus part', the use of the term 'counterfeit part' to refer to the broader problem[154] and the use of the term 'suspected unapproved part' all makes for a very confusing situation.

It is worth pausing at this stage, however, to consider the use of the term 'unapproved part' as the correct legal appellation. The *Oxford English Dictionary, Volume II* defines 'bogus' as

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[152] *SUPPP, supra*, note 26 at 3-2

[153] See *supra* note 22 and *supra* at 11.

[154] It is argued in this thesis that 'counterfeit parts' are but one of several types of unapproved parts which should be combated. See *supra* at 14.

"[c]ounterfeit, spurious, fictitious, scam...",[155] but this is not a legal term.[156] Nonetheless, there has been substantial opposition to the scrapping of the use of this word in favor of 'unapproved' as a better legally recognized term. This opposition is a reaction to the FAA's use of the term '*suspected* unapproved part',[157] which is its mechanism for broadening the concept of unapproved parts to include undocumented parts (ie. parts which are suspected of being unapproved, but this cannot be confirmed because they lack accompanying documentation[158]). Proponents of the term 'bogus part' feel that sub-standard parts should be the focus of attention and that focusing on undocumented parts is ignoring the problem. As one author has stated, "[t]he threat is from bad parts and not bad paperwork."[159] However, as these people would no doubt agree, the issue in regulating this problem is to address *unsafe* parts;[160] and , as has been shown above, undocumented parts do indeed pose a danger to aviation safety.[161] Thus, it would seem preferable to simply use the term 'unapproved parts' and include both types of dangerous parts in one regime. This avoids further duplication by including undocumented parts in the regime addressing sub-standard parts.

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[155] *Oxford English Dictionary, Volume II*, 2nd ed. (Oxford : Clarendon Press, 1987) at 360.

[156] None of the following legal references contain the term 'bogus' : E. Martin, ed., *A Concise Dictionary of Law*, 2nd ed. (Oxford, New York : Oxford University Press, 1990); E. Ivamy, *Mozley & Whitley's Law Dictionary*, 10th ed. (London, Sydney, Toronto : Butterworth's, 1988); or C. Finch, ed., *Words and Phrases Judicially Defined in Canadian Courts and Tribunals, Volume I* (Toronto : Carswell, 1993).

[157] See the *SUPPP, supra* note 26.

[158] See discussion *supra* at 14.

[159] Schiavo, *supra* note 3 at 103.

[160] Canadian Aviation Regulatory Advisory Council (CARAC), *Final Report of the Approved Aircraft Parts Regulatory Review Working Group* (Ottawa : CARAC, 1996) [hereinafter *CARAC Report*]. "Our top priority is safety and when it comes to aircraft parts, we need to ensure that the right part is installed." *Ibid.* (Regarding the CARAC Working Group, see (date unknown) http://www.tc.gc.ca/aviation/regserv/carac/CARAC/parts/english/awwg4e.htm (date accessed : 08 June 1998).) See also the *SUPPP, supra* note 26. One of the aims of the FAA Suspected Unapproved Parts Task Force (which published the SUPPP) was "[t]o promote the highest level of aviation safety by elimination of the potential safety risk posed by the entry of unapproved parts in the US aviation community." *Ibid* at vi.

[161] See discussion *supra* at 14.

Beyond the dispute as to the labeling of the concept of unapproved parts, it is important to reiterate that currently there is no clear, concise and consistently used definition of an unapproved part explicitly included in regulations, encompassing all possible types and classifications of unapproved parts. To clear up the uncertainty, a two-legged definition is proposed, with an 'approved part' defined separately from an 'unapproved part'. First, it is proposed that an 'approved part' be defined as :

> an aircraft part that is eligible to be installed on an aircraft, or other type certificated equipment, in accordance with the aircraft's type design or in accordance with applicable regulations.

Thus, this is a part that is designed, produced and maintained in such a way that it is in a condition for safe operation. Such an approach remedies the deficiency in the Suspected Unapproved Parts Program Plan (SUPPP) which does not include such a single definition preferring to define an approved part by listing ten applicable regulations in terms of which a part is eligible for installation on an aircraft.[162] Apart from being very lengthy, this is also self-restricting and does not allow for future possible regulation or other changes. The definition proposed above also addresses the shortcomings of the definition accepted by the Canadian Aviation Regulatory Advisory Council (CARAC) Working Group. This Group defines an approved part as a part which is "airworthy" under a set of Design Standards or applicable regulations.[163] The CARAC definition is very close to the defintion proposed here, but can be criticized though, on the grounds that it is conceivable that a part could be airworthy but that it should not be eligible for installation. For example a set of helicopter blades which have not

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[162] *SUPPP, supra* note 26 at 3-4.
[163] *CARAC Report, supra* note 160.

yet expired, but with false documentation regarding their remaining lifetime are airworthy, but should not be eligible for installation.

Second, the defintion of 'unapproved part' must be clarified. The Suspected Unapproved Parts Program Plan (SUPPP) defines an 'unapproved part' as "[a]ny part that does not meet the requirements of an 'approved part'".[164] However, it is proposed that regulations contain the following modification as a definition of an unapproved part :

> any part that does not meet the requirements of an approved part *and/or which cannot reasonably be identified as meeting such requirements.*

The emphasized section serves to include undocumented parts into the definition of unapproved part and to allow for falsely documented parts.

The combined effect of the above two definitions is that all of the possible types and classifications of unapproved parts are included.

Now : along with a definition of an unapproved part, it is necessary that regulations address the visual identification of approved parts. Currently, as mentioned above, the regulations rely heavily on documentation. Regulations exist which mandate the marking of life limited components[165] by means of "permanently etching, engraving or stamp[ing] directly on the aeronautical product or an identification plate securely attached thereto"[166] the manufacturer's name, trademark or a serial number. Furthermore, if maintenance has been done on a part, a

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[164] *SUPPP, supra* note 26 at 3-5.
[165] US, 14 C.F.R. s. 45.14; Canada, SOR/96-433, s. 201.09.
[166] Canada, *ibid* at 201.05(2)

Maintenance Release must accompany the part stating that the part still conforms to its Design Standards and is in a safe condition for operation.[167] A final example of a documentary requirement in current regulations is that if a part is a life limited part, it must be accompanied by a technical history of the part to show that it has not exceeded its life.[168] In addition to these parts, even though not all aircraft parts currently have a documentary requirement such as those just outlined, current industry practice among responsible operators is that no part whatsoever will be purchased without some form of documentary identification.[169]

There are two key problems with the current regulatory approach to parts documentation. First, the ease with which documentation can be forged or obtained has the effect of making any documentary requirement almost redundant. Indeed, not only do "[a]ll [unapproved] parts have forged documentation,"[170] but "[c]riminal dealers in recycled and crash-salvaged parts can [also] circumvent inspections and tests simply by lying about where they got them."[171] The ease with which this can be done is illustrated by the 1993 cases of two FAA-certified mechanics who were just giving away blank, signed FAA Form 8130's.[172] Second, in practice, existing documentary requirements can become very cumbersome. For example, there is the much-

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[167] Canada, Transport Canada (TC), *Canadian Airworthiness Manual* (Ottawa : TC, 1997) [hereinafter *Canadian AM*] at Chapter 571.08 (1)(b). In the US, a Maintenance Release is the well-known 'Yellow Tag' or FAA Form 8130. US, 14 C.F.R. s. 43.9.

[168] Canada, *ibid* at Chapter 571.09.

[169] Interview with H. Hall, Air Canada (29 May 1998).

[170] *Interpilot, supra,* note 5 at 14.

[171] Bajak, *supra* note 1.

[172] *Supra* note 167. See Stern, *supra* note 57. "[T]he so-called Yellow Tag is easier to forge than the spare itself." *Interpilot, supra* note 5 at 14. The SUPPP also recognizes this reality.

> [P]roperly executed certificates of compliance provide a reasonable degree of assurance as to the accuracy of the data associated with the parts. Unfortunately, there may be many certificates...which are not properly executed...and these may pose a serious threat to the system when accepted...without knowledge of [their] potential accuracy.

SUPPP, supra note 26 at 6-2.

maligned 'paper trail' which must accompany life-limited parts tracing their life and use 'back to birth'.

To remedy this state of affairs, three possible solutions are proposed : (1) introduction of a requirement to use modernized marking technology; (2) reducing the evidentiary value of identifying documentation; and/or (3) explicitly prescribing different documentary requirements for different types of parts. It is worthwhile to review each of these proposed solutions in more detail.

Firstly, instead of explicitly prescribing etching, engraving, stamping or attaching an identification plate, as they currently do,[173] regulations should require *effective* marking (which will not become damaged, destroyed, lost or detached during normal operation [174]) and marking which is *reasonably resistant to copying*. This will open the way for the use of updated marking technology such as bar-coded safety wire,[175] covertly marking parts with scanable chemical codes,[176] 'intrinsic signaturing',[177] lazer marking, mixing optical tags into paint and spraying them onto parts, [178]or embedding minute computer chips into parts.

Secondly, since part documentation is so easily forged, its evidentiary value should be no more

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[173] Canada, *supra* note 167.

[174] See Canada, *ibid* at s. 201.06(2).

[175] See (03 March 1997), http://www.awgnet.com/safety/nz-97.html (date accessed : 19 May 1998). Every aircraft part is sealed with a safety wire, threaded through holes in bolts. Therefore, every maintenance action requires cutting wires. Putting bar codes on such wires will enable them to be scanned, saying who installed the part and when. *Ibid.*

[176] See (date unknown), http://www.permion.com/authentication.html (date accessed : 13 May 1998).

[177] See (date unknown), http://www.netventure.com/vt/isis/details.html (date accessed : 13 May 1998). Intrinsic signatures of parts, when viewed under an Intrinsic Signature Identification System (ISIS) reveal recognizable and readily distinguishable micro-anomalies ('virtual fingerprints') of that particular part. *Ibid.*

[178] See Elliot, *supra* note 90 at 37.

than *prima facie*. Since all licenced organisations know about unapproved parts, they cannot rely any longer on just checking the documentation and tags.[179] A good example of a provision that should be included in national aviation regulation is the provision of Chapter 571.13(d) of the *Canadian Airworthiness Manual* which states :

> [p]rior to installation, [a] part should be inspected to ensure that it corresponds with its documentation, there are no signs of obvious damage, corrosion or deterioration, and the...life where applicable has not been exceeded.[180]

In the third place, while the ineffectiveness of accompanying part documentation would appear to be self-evident, there are nonetheless commentators and groups in the US who argue for *increasing* documentary requirements as the solution.[181] They feel that "[m]ore regulations are not the answer. Tight Record Keeping is the key to having *an adequate chain of documentation for the users of aircraft parts.*"[182] Or, as the (US Aviation) Industry Suspected Unapproved Parts Steering Group puts it:

> the biggest single hole through which unapproved parts enter the system is a result of having no requirement for an *end-to-end- system of credible and understandable documentation*, since there is no legal requirement or means to *have an original part's airworthiness certification travel with the part.*[183]

There are several problems with this approach of increased documentation. One writer has made

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[179] Kaiser, *supra*, note 4.

[180] *Supra*, note 162. Note that the *Canadian Airworthiness Manual* is an example of advisory regulatory material referred to above, and the ideal would be that this provision be binding by the substitution of 'shall' for 'should'. See *supra* at 51.

[181] The groups proposing this solution are invariably the same people calling for regulation of parts distributors. See discussion *infra* at 82.

[182] *Flight Safety Digest Jan/Feb '94*, citing (US) Aeronautical Repair Station Association, Press Release, "ARSA Calls for Bogus Parts Changes" (26 October 1993) [emphasis added]. In other words, these groups feel that all parts, and not just life-limited parts, should be accompanied by a paper trail.

[183] Cited by P. Gallimore, "Elimination of Unapproved Parts" [April-June 1996] Airliner 28 [emphasis added].

the observation that

> [w]hat [these groups] would have [the FAA] do...is that *every single part would have a complete chain of custody with it at all times* and available to auditors to look at...[A]n organization like American Airlines or Delta Air Lines has tens of millions of parts in its stock. Do they have file cabinets of tens of millions of pieces of paper? What would the benefit of all that paper be?[184]

Furthermore, the documentation and or traceability of parts is not always possible as many aircraft parts are delivered as part of a higher assembly, such as an aircraft or component, and do not have their own documentation.[185] Moreover, as aircraft get older, often the only source of replacement parts is other old aircraft which due to their age may have been separated from parts documentation years ago.[186]

The preferred solution to this problem may be to require different amounts of documentation according to the nature of the part. The reason for this approach is that certain parts and components installed on aircraft need very strict surveillance and control while others need not be controlled to the same extent.[187] Thus, it is recommended that parts be classified for the purposes of documentary requirements. A first possible means of classification is the FAA Suspected Unapproved Parts Program Plan (SUPPP)'s use of part 'criticality' by dividing parts

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[184] Cited by P.Flint, "All Parts are not created equal" [July 1994] Air Transport World 46 [emphasis added].

[185] *CARAC Report, supra* note 160.

[186] *Ibid.*

[187] *Ibid.* An existing example of this is the current requirement that only life-limited parts to be accompanied by their history. *Supra* note 166.

into Category 1,[188] 2,[189] or 3[190] parts and assigning different documentary requirements to each category.[191] A second possibility is classifying parts as disposable (which would require authentification and tracking only from the manufacturer to the user) or as rotable[192]/life-limited parts(which require full lifetime tracking in addition to authentification).[193] Further possibilities might be the (US) Air Transport Association Specification 106 (ATA Spec. 106)'s classification of parts as 'major' or 'minor',[194] or the US Federal Aviation Regulations (FAR's) division of equipment into Class I (ie. complete aircraft engines, or propellers), Class II (ie. a part the failure of which would cause an aircraft to crash) or Class III.[195] It is proposed, however, that the most effective classification of parts for the purposes of documentary requirements is that used by Air Canada.[196] It uses a documentation matrix[197] combining three axes, namely part type, part supplier[198] and part condition.[199]

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[188] A Category 1 part is "one whose intended use indicates that the consequences of its failure could, considered separately and in relation to other systems, reduce safety margins, degrade performance, or cause loss of capability to conduct certain flight operations so as to prevent the continued safe flight and landing of the aircraft." *SUPPP, supra* note 26 at 6-13.

[189] A Category 2 part is one "whose failure would not prevent continued safe flight and landing of the aircraft, but that may reduce the capability of the aircraft or the ability of the crew, by increasing the workload, for example, to cope with adverse operating conditions or subsequent failures." *Ibid.*

[190] The failure of a Category 3 part "would not cause a departure from 'Normal Operating Procedures'". *Ibid.*

[191] The SUPPP does not however use part criticality as a measure of determining documentary requirements, but uses this to determine the urgency of subsequent investigation after an unapproved part is reported. An analogous use for determining required parts documentation is however possible.

[192] A rotable part is a part which can be used indefinitely, requiring only periodic servicing or repair. It does not wear out, and is not life-limited.

[193] Elliot, *supra* note 90.

[194] *Supra* note 7 at 1-8.

[195] The FAR's do not use this classification for documentary differentiation, but for use in the issue of Export Airworthiness Certificates, however once again use of this classification for other purposes is not impossible.

[196] See Appendix 1. See also *ATA Spec. 106, supra* note 7 at Appendix B; FAA, *Advisory Circular 00-56, Voluntary industry Distributor Accreditation Program* (Washington, DC : FAA, 09 May 1996) [hereinafter *FAA AC 00-56*] at Appendix 1.

[197] Sub-divided into : standard parts, commercial parts, life-limited parts, time controlled parts, rotable parts and expendable parts. See Appendix 1.

[198] Sub-divided into : OEM, PMA or TSO holder; repair station; or distributor. *Ibid.*

[199] Sub-divided into : new/unused, repaired, overhauled or repairable.

Finally, once a documentary requirement has been laid down for each specific classification of part, it is important that the regulations explicitly require the transfer of documentation by both the party transferring a part and the party receiving the part.

B. Proscription of Unapproved Parts-related Activities

After a legal definition of the problem, the second issue which an effective national transportation or aviation-specific regulatory regime against unapproved parts must address is the explicit prohibition of all possible activities in the chain of manufacture, distribution and installation of unapproved parts. To reiterate, all levels of the aviation industry are involved in the trade in unapproved parts, including repair stations, distributors, legitimate manufacturers, operators, as well as persons outside the industry, such as counterfeiting operations. It is therefore important that no activity in this chain escapes regulatory attention. Four acts should be targeted : (1) producing (for example, by counterfeiting a part or overhauling a scrap part) or selling an unapproved part; (2) falsely presenting a part as approved (in the form of falsifying documentation); (3) installing an unapproved part; and (4) failure to dispose of scrap parts or report unapproved parts. Before discussing each of the above proscriptions, it is necessary to consider several preliminary matters.

The first preliminary matter to consider is the form of fault to be required of an offender before liability will attach. The question here is : should regulations prohibit the above actions only when committed 'knowingly' or is negligence sufficient? It is submitted that the current aviation industry standard is such that all industry elements ought to know of the existence of

unapproved parts and guard against them.[200] Therefore, general intent should be a sufficient form of criminal fault here, such that the above acts should be prohibited irrespective of whether the doer knew he was dealing with an unapproved part or not.[201] The standard for determining negligence would be determined by the regulations defining an unapproved part. It should be remembered that the proposed definition of an unapproved part in this thesis is a part which cannot be "reasonably identified" as an approved part.[202] Thus, if a defendant did not take all reasonable steps to identify a part as approved before committing the prohibited act, he would be guilty. What constitutes 'reasonable' would depend on several factors. Firstly, the regulations concerning what documentation is required for a specific part and its evidentiary value[203] should be determining. Secondly, the current industry standard with regard to vigilance for unapproved parts would have to be considered.[204] Lastly, it would be for the courts to lay down guidelines in interpreting the regulations.

The second important preliminary point to be made is that merely prohibiting these acts in relation to unapproved parts is meaningless in the absence of effective sanctions. Currently, in terms of the US Federal Aviation Regulations (FAR's), the only penalty for contravention of

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[200] See Kaiser, *supra* note 4. See also P. Lange and W. Thomas, "Pitfalls in the Transfer of Aircraft Parts. Commercial Concerns and Criminal Liabilities" (Paper presented at (US) Airline Suppliers Association (ASA) Annual Conference, 20-22 July 1997) [unpublished] at 18 to 19.

[201] In this respect the *Aviation Repair Station Safety Act, H.R. 145, A Bill to Effect Certain Amendments to the Foreign Repair Station Rules of the Federal Aviation Administration,* 1st Sess., 105th Congress, 1997 (date of introduction : 07 January 1997) currently pending before the US Congress is to be criticized, since it proposes to only to suspend the certification of Repair Stations which "knowingly" install unapproved parts. In other words, Repair Stations negligently installing such parts would presumably escape prosecution. See discussion *infra* at 70 . In fact the question can be asked if negligence should ever be tolerated when it comes to aviation safety. See J. Jakubiak, " Maintaining Air Safety at Less Cost : a Plan for replacing FAA Safety Regulation with Strict Liability" (Winter 1997) Cornell Journal of Law and Public Policy 421.

[202] See *supra* at 57.

[203] See discussion *supra* at 57.

[204] See discussion *infra* at 115.

these regulations is loss of certificate (for example a Repair Station Certificate or airline operating certificate).[205] Suspension of certificate is also a penalty under Canadian regulation.[206] It is doubtful, however, whether the loss of a certificate is a sufficient deterrent to dishonest industry elements. In addition to this, not all of the possible offenders in an unapproved parts scenario would indeed be certificate holders, such as distributors or parts counterfeiters. It is therefore necessary to combine certificate suspension with further sanctions. These could be jail terms or fines where necessary. Moreover, regulations could also prescribe civil penalties to streamline the application of private law remedies in cases involving unapproved parts. The FAA Suspected Unapproved Parts Program Plan (SUPPP) endorses this approach in proposing that civil penalties be increased with regard to unapproved parts.[207] An example of combining loss of certificate with further sanctions is to be found in the Canadian *Aeronautics Act* which stipulates that :

> [e]xcept as otherwise provided by this Part, every person who contravenes a provision of this Part or any regulation or order made under this Part is guilty of an offence punishable on summary conviction...[Furthermore, a]n individual who is convicted of an offence under this Part punishable on summary conviction is liable to a fine not exceeding five thousand dollars and...to imprisonment for a term not exceeding one year or to both fine and imprisonment[208].

At this point the review of the prohibition of the four unapproved parts-related activities can begin.

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[205] See US, 14 C.F.R. s. 21.2(b) for example.

[206] Canada, *Aeronautics Act*, R.S.C. 1985, c. A-2, s. 6.9 (1) (s. 6.9, added, R.S., c. 33 (1st Supp.), s. 1; 1992, c. 1, s.5).

[207] *SUPPP, supra* note at 6-9.

[208] *Supra* note 206 at s.7.3(3)-(4) (s. 7.3, added, R.S., c. 33 (1st Supp.), s. 1; 1992, c. 4, s. 16; 1996, c. 20, s. 103).

1. Producing or Selling Unapproved Parts

The first activity which should be proscribed by regulations is the production or selling of unapproved parts. Currently in terms of the US Federal Aviation Regulations (FAR's) manufacturing of counterfeit or other unapproved parts is not prohibited, and neither is it prohibited to sell or buy unapproved parts.

To remedy this deficiency, the following regulatory provision is proposed:

> No person shall, either by direct or indirect means, *make available* for installation on type certificated equipment any unapproved part.

It is worthwhile to analyze the elements of this proposed provision. Making available unapproved parts by 'direct' means would include selling or giving away unapproved parts. Making unapproved parts available by 'indirect' means would include the manufacture of counterfeit parts, as well as stealing parts, rebuilding parts and/or modifying parts. Moreover, indirectly making an unapproved part available might even be construed to include causing a part to become separated from its documentation.

An important qualification in the proposed provision suggests that only making unapproved parts available 'for installation on type certificated equipment' be prohibited. Thus, reasonable activities respecting unapproved parts are not prohibited - for example giving away a scrapped propeller (which would be considered an unapproved part in the light of this paper's proposed definition) for decorative or museum use. Nevertheless, it would not be possible for a defendant to plead that he thought that the scrapped propeller was being given for museum use, when in

fact its buyer intended to install it. The reason for this is that the defendant not only has the *duty* not to make available unapproved parts *for installation*, but also has the parallel duty proposed below to take reasonable steps to prevent unapproved parts from being installed. [209]

2. Falsely Presenting an Unapproved Part as Approved or Misrepresenting an Approved Part

The second activity which national regulations should proscribe is in fact to some extent already prohibited by existing regulations in Canada and the US, namely the false presentation of an unapproved part as approved or the misrepresentation of an approved part.[210] The US Federal Aviation Regulations (FAR's) at Part 43.12 provide as follows with respect to Maintenance Records:

> [n]o person may make or cause to be made:
> (1) Any fraudulent or intentionally false entry in any record or report that is required to be made, kept, or used to show compliance with any requirement under this part;
> (2) Any reproduction, for fraudulent purpose, of any record or report under this part; or
> (3) Any alteration, for fraudulent purpose, of any record or report under this part.

And further, at Part 21.2, the FAR's state with respect to type certificates:

> [n]o person shall make or cause to be made--
> (1) Any fraudulent or intentionally false statement on any application for a certificate or approval under this part;
> (2) Any fraudulent or intentionally false entry in any record or report that is required to be kept, made, or used to show compliance with any requirement for the issuance or the exercise of the privileges of any certificate or approval issued under this part;
> (3) Any reproduction for a fraudulent purpose of any certificate or

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[209] *Infra* at 72.

[210] See Maynard and Moak, *supra* note 84. "Significantly, the manufacture of counterfeit parts is not prohibited by FAA regulations; only a false representation of certification is outlawed." *Ibid.*

approval issued under this part.
(4) Any alteration of any certificate or approval issued under this part.

In the case of Canada, the Canadian Aviation Regulations (CAR's) do not contain any similar stipulations. However, the Canadian *Aeronautics Act*[211] provides that:

> [n]o person shall...make or cause to be made any false entry in a record required under this Part to be kept with intent to mislead or willfully omit to make any entry in any such record.

The above US and Canadian provisions would cover, for example, false documents regarding the record of use of a life-limited part, since the regulations require such a record to be kept. However, these provisions are limited to physical documentation (such as records and certificates), and do not apply to making of a false oral statement about the nature of a part. Furthermore, these provisions do not address parts markings or other documentary requirements. A second limitation of the above provisions is that they require the defendant's fault in the form of intent - negligence appears to be excused.[212] In recognition of the deficiencies of the current regime, it is proposed that the existing provisions be amended by inserting a provision with the following terminology :

> No person shall, either explicitly or otherwise, falsely or *without reasonable grounds* present an unapproved part as approved or in any way misrepresent an approved part.

The emphasized phrase serves to include the summary documentation (without inspection, for example) of undocumented parts where the true nature of the part has not first been determined.

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[211] *Supra* note 207 at s. 7.3(1)(c) (s. 7.3, added, R.S., c. 33 (1st Supp.), s. 1; 1992, c. 4, s. 16; 1996, c. 20, s. 103).

[212] See discussion *supra* at 63.

3. Installing Unapproved Parts

The third activity which should be proscribed by national regulation is the actual *installation* of unapproved parts on aircraft where they are in the position of potentially causing damage. The mere possession of such parts should not be prohibited, however, since on their own they pose no danger. Parts such as parts scrapped for decorative or museum use as well as parts currently in inspection or repair would be classified as unapproved parts according to the definition proposed in this paper.[213] Prohibiting the possession of unapproved parts would therefore also include these parts, which would be senseless.

In Canada, this issue has been effectively addressed in the Canadian Aviation Regulations (CAR's) which contain stipulations respecting the installation of new, used and life-limited parts.[214] These clauses are very detailed and require that only parts which are *airworthy* according to regulations and the aircraft's design standards be installed. This effectively means, in other words, only 'approved parts' must be installed. CAR Part 571.08, for example provides that:

> (1) [n]o person shall install a used life-limited part on an aeronautical product unless the part meets the standards of airworthiness applicable to the installation of life-limited parts and;
> (a) the technical history of the part...is available to show that the time in service authorized for that part in the type certificate governing the installation has not been exceeded; and
> (b) the history referred to in paragraph (a) is incorporated into the technical record for the aeronautical product on which the part is installed.

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[213] See FAA, *Advisory Circular 21-29B, Detecting and Reporting Suspected Unapproved Parts* (Washington, DC : FAA, 20 February 1998) [hereinafter *FAA AC 21-29B*] at5.

[214] Canada, SOR/96-433, s. 571.06-08.

However, as detailed as it is, this CAR, still permits the installation of unapproved parts in certain cases. For example, the requirement in paragraph (a) requires only that it be evident that the life of a part has not been exceeded. Therefore, this would presumably not prohibit the installation of a life-limited part which had not yet reached the end of its life, but for which the accompanying documentation specified a longer remaining lifetime than was actually the case.

The US approach under the Federal Aviation Regulations (FAR's) is not quite as extensive as in Canada's CAR's. The only provision in the FAR's which might be construed as preventing the installation of unapproved parts is that contained in FAR, Part 43.13(b) which states the following:

> [e]ach person maintaining or altering, or performing preventive maintenance, shall do that work in such a manner and use materials of such a quality, that the condition of the aircraft, airframe, aircraft engine, propeller, or appliance worked on will be at least equal to its original or properly altered condition (with regard to aerodynamic function, structural strength, resistance to vibration and deterioration, and other qualities affecting airworthiness).

The US Congress has recently attempted to specifically[215] supplement the above general provision in the *Aviation Repair Station Safety Act*.[216] This proposed legislation, currently being considered by the US Congress, suggests that :

> [t] he [FAA] Administrator shall issue an order revoking a certificate issued...to a Repair Station...if the Administrator finds that the station...knowingly used an uncertified or substandard airframe, engine, propeller, appliance, or any other part in the repair of an aircraft.[217]

This Bill exhibits several shortcomings. For example, it requires only specific intent and lays

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[215] See discussion *supra* at 51 regarding the necessity to supplement general regulation with specific measures where loopholes may exist. This is an example of such supplementation.

[216] *Supra* note 201.

[217] *Ibid* at s. 4.

down only certificate loss as penalty. Nevertheless, it is a step in the right direction.

A particular challenge to getting such legislation passed is the opposition against placing a duty to guard against installing unapproved parts on Repair Stations. The US National Air Transport Association (NATA) is one of the foremost opponents of this proposed legislation. This Association has delared : "[l]anguage and proposals should be focused on counterfeit parts and individuals that are misrepresenting parts with the intent to defraud the customer. Current proposals are aimed at penalizing mechanics and technicians and not the true criminals, the distributors and manufacturers."[218] Thus, this criticism focuses on the characteristic that a duty to guard against installing unapproved parts places too great a burden on ordinary 'blue collar' workers on the ground.

On the other hand, there are four arguments which counter this line of thinking. Firstly, the legal construction of vicarious liability would serve to remove the burden from the shoulders of the blue collar worker individually and the legislation would not have the effect of workers on the ground themselves being targets of liability suits.[219] Second, the proposed Bill only targets Repair Stations who 'knowingly' install unapproved parts and a duty to refrain from intentionally installing unapproved parts is by no means an undue burden. Thirdly, any requirement imposed on Repair Stations to be vigilant against unapproved parts is not unreasonable, since they are in the best position to prevent these parts from being installed on

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[218] (US) National Air Transport Association (NATA), Press Release commenting on H.R. 145, (18 May 1998), http://www.avweb.com/other/nata9820.html (date accessed : 18 May 1998).

[219] See Lange and Thomas, *supra* note 200, at 17.

aircraft.[220] Vigilance by Repair Stations has been shown many times to lead to the detection of unapproved parts.[221] Lastly, "[c]onclusory statements that the ultimate source of responsibility is in the installer cannot relieve others of their responsibilities in this matter,"[222] and indeed the regime proposed in this thesis does target all other possible parties with regard to unapproved parts (although the current US regulatory regime does not).

Consistent with the above line of thought, it is suggested that the following provision be added to the regulation :

> No person shall install on type certificated equipment any unapproved part or part thereof.

4. Failure to Dispose of Scrap Parts or Report Unapproved Parts

A fourth activity which should be proscribed by national regulation is the failure to dispose of scrap parts or report unapproved parts. An illustration of this activity and its potential consequences is helpful. In the 1991 Gulf War, a British Airways (BA) Boeing 747 was destroyed in Kuwait City. After the war, the wreckage had become the property of BA's

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[220] As Broderick has pointed out, there are only four ways in which an unapproved part can get onto an aircraft : because the manufacturer placed it there; because an airline repaired the aircraft and put it there, because a Repair Station repaired the aircraft and put it there; or because an individual mechanic put it there. Cited by Flint, *supra* note 184 at 46.

[221] The case of the United Airlines mechanic who discovered the counterfeit Pratt and Whitney spacers referred to above is one example. *Supra* note 1. During a visit to Air Canada, which was one of the airlines which found further examples of the offending seal spacers in their inventory after being alerted by Pratt and Whitney in the United Airlines case, this author was shown one of the counterfeit seal spacers along with a true example of the part they were meant to copy. The difference between the two was immediately obvious, even to a layman's eye. The US Coast Guard, for example began a programme of just visually inspecting every part received by them (instead of just random samples) and within a short period of time had detected over 1200 unapproved parts. Schiavo, *supra* note 3 at 120. "A detailed inspection of all parts and materials when they are received into the maintenance stores area is one of the most important steps in ensuring [unapproved] parts do not become part of an operation...A close examination will often disclose that something 'just doesn't look right'." *Flight Safety Digest Jan/Feb '94, supra* note 5 at 12, citing R. Feeler.

[222] Luedemann, *supra* note 4 at note 395.

insurers, Lloyds' of London, who in turn subsequently sold the remnants of the aircraft to a parts broker for scrap metal. Even though the parts broker had contracted with Lloyds to destroy all useable parts remaining on the wreckage, he violated his promise and sold some of the parts which ultimately turned up on the US civil aviation parts market. BA insisted that it was not to blame since it had issued explicit instructions that the parts "should never be allowed to enter the...market."[223] Fortunately, the parts broker and the other parties who were involved in the sale of these parts were apprehended and prosecuted successfully.

Thus this story ended happily. The hypothetical question is however, what would have been the result if the parts in this case had failed and caused an accident before they had been detected? The position of this paper is that BA should have been required to have disposed of the parts more effectively.

The FAA Suspected Unapproved Parts Program Plan (SUPPP) recognizes this position by proposing that aviation parts which are classified as "scrap" are "destroyed" to prevent their re-entry into the aviation system.[224] The mechanism by which the SUPPP suggests this obligation be implemented is by distinguishing unapproved parts which are "salvageable" (parts which can be restored to some aviation use) from those which are "scrap" - the requirement is then that only scrap parts be destroyed.

The SUPPP solution poses two problems. Firstly, this approach creates no obligation to equally

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[223] J. Micek, "Jet Wreckage Theft Prosecuted" (05 June 1997), http://www.medill.nww.edu/medill/headlines/mpol/050697.html (date accessed : 13 may 1998).

[224] *SUPPP, supra* note 26 at 6-18.

ensure that unrepaired salvageable parts do not enter the system. Secondly, as the SUPPP recognizes, given that scrap parts are private property, it may be difficult to mandate that they be destroyed if their owners deem them to have some value beyond their basic material content.[225] The SUPPP's solution to this second problem is actually no solution at all and is merely ignoring the problem such that it states that "i[n] many cases, the safety needs [of destroying scrap parts] outweigh private property interests."[226] To resolve these problems, it is proposed that the regulations should include the following provision :

> No person shall, where in a position to do so, and within a reasonable period of time, fail to take reasonable steps to prevent an unapproved part from becoming available for installation on type certificated equipment.[227]

The advantages of this provision start with its sufficiently wide scope covering other unapproved parts (for example so that salvageable parts awaiting repair also fall under the disposal obligation). Furthermore, it allows for other effective steps besides destruction to be taken.[228]

Moreover, such a provision would also address another unapproved parts question: what should be done with all the unapproved (and especially undocumented) parts which are currently

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[225] *Ibid.* at 6-20.

[226] *Ibid.*

[227] A proposal along similar lines, but addressing only life-limited parts is contained in the Canadian *Notice of Proposed Amendment (NPA) of Chapter 571.09 of the Canadian Airworthiness Manual*, NPA-Nov-97-6 (available on Transport Canada Worldwide Web Site, http://www.tc.gc.ca) at Information Note (i). "When parts have reached their life-limit, all possible action must be taken to ensure that the part does not re-enter the system..." *Ibid.*

[228] For salvageable parts these might include controlling them to ensure that they are repaired and returned to service, while examples of effective disposal of scrap parts are given in Aviation Partners (an association under the leadership of the Aerospace Industries Association of Canada (AIAC)), *Approved Parts Handbook*, 3rd issue (Ottawa : Aviation Partners, January 1997) [hereinafter *Unapproved Parts Handbook*]. For example, this could be "mutilation" or simply removing an identification plate - all depending on the nature of the part. *Ibid* at 4-3.

installed and flying on aircraft. The SUPPP addresses the latter question in a whole section devoted solely to the "Removal of 'unapproved parts' from the system."[229] However, this paper suggests that such measures would be unnecessary. It is physically impossible to require that all parts in service be stripped and checked. Thus, the combination of already existing periodic maintenance procedures with the duty proposed above to take effective preventative steps when unapproved parts are discovered can more easily solve the problem.

A particular mandatory action respecting unapproved parts that several commentators have suggested is introducing a requirement of the compulsory reporting of unapproved parts.[230] A reporting requirement serves a two-fold purpose : it contributes to enforcement and eases the burden of inspectors; and it is a preventative measure, raising a flag before an unapproved part causes an accident. Nevertheless, a reporting requirement has a number of limitations. Firstly, as in the case of the disposal requirement discussed above, any required reporting of unapproved parts which do not pose a threat must be avoided.[231] Secondly, two practical realities also exist which may be difficult to overcome by regulation. Recipients of unapproved parts may prefer to return them to their suppliers for refunds, rather than report the supplier and have the parts become evidence in drawn-out prosecutions.[232] Also, there have been cases in the past where a reporting system has been misused for competition reasons.[233]

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[229] *Supra*, note 26 at 6-20.

[230] See *SUPPP, supra* note 26 at 5-1; Luedemann suggests mandatory reporting of unapproved parts within 48 hours of discovery. *Supra* note 4 at 158.

[231] Such as unserviceable parts awaiting repair or old parts, for example used for decorative or museum use. See *SUPPP, ibid* at 5-1.

[232] *SUPPP, ibid*; Schiavo, *supra* note 3 at 108.

[233] Mac Leod and Filler, *supra* note 10.

Although the US Federal Aviation Regulations (FAR's) do not address the problem of unapproved parts in the specific manner which is proposed in this thesis, these regulations do contain several reporting requirements. FAR, Part 13.1 provides that any person who is aware of any violation of the FAR's "should" report it to the nearest FAA office as soon as possible (although, as pointed out already, not all unapproved parts actions are currently violations of the FAR's) . Furthermore, FAR Part 21.3 requires type certificate, production certificate or Parts Manufacturing Approval (PMA) holders who become aware of any subsequent "failures, malfunctions and defects" of their products to report them.

The Canadian system addresses the problem with more specific provisions than in the United States.[234] Chapter 591 of the *Canadian Airworthiness Manual* at paragraph 591.01 describes a system called the Service Difficulty Reporting (SDR) such that a person "shall", within 3 working days of discovering service difficulty, submit an SDR. Appendix B of this same chapter of the *Canadian Airworthiness Manual* provides that a "reportable service difficulty" is "[a]ny defect, malfunction, or failure of an aeronautical product affecting, or that if not corrected is likely to affect, the safety of the aircraft, its occupants or any other person." Appendix C lists examples of such service difficulties and at paragraph (3)(d), explicitly lists unapproved parts. In turn, Appendix D in turn is devoted entirely to explaining the reporting of unapproved parts. This solves most of the problems outlined above; for example, Appendix D explicitly lists the types of unapproved parts to be reported.

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[234] In the US, the SUPPP has however now instituted a system called a Parts Reporting System (PRS), containing a reporting system, combined with a database run at agency level. See (date unknown), http://www.faa.gov/avr /sups/htm (date accessed : 07 June 1998); See also *AC 21-29B*, *supra* note 213.

C. Providing Effective Mechanisms to Enforce Proscriptions

The next element to be contained in a national anti-unapproved parts legal regime is that the regulations must provide effective mechanisms to enforce the proscriptions outlined above. The first question to be asked here is who should be responsible for enforcing regulations respecting unapproved parts? If a state's department of transportation is given this responsibility, should it be further delegated to the civil aviation authorities and if so, maybe even further passed on to a special body dealing only with unapproved parts? As an alternative approach, should a country's Department of Justice enforce regulations respecting unapproved parts?

This paper proposes that unapproved parts regulations be administered by a combined effort of civil aviation authorities and the Department of Justice. Ground-level policing and investigation of violations should be a civil aviation responsibility; and violations of regulations should be handed over to the Department of Justice for criminal prosecution. The rationale behind this argument is that Department of Justice officials do not have the specific aviation expertise and experience needed for aircraft inspections. It is doubtful, however, whether it is necessary for a separate designated unapproved parts body or 'programme' to be set up within the civil aviation structure. Indeed the comprehensive and effective legal regime proposed in this thesis obviates the need to come up with further plans and procedures to combat the problem. However, in the absence of such a regime, there are advantages to be gained from the existence of such a designated unapproved parts body[235] but the cheaper alternative is certainly a

[235] The FAA Suspected Unapproved Parts Program Plan (SUPPP), *supra* note 26 at 4-1, proposes that a national unapproved part body be set up in the US. The SUPPP lists several functions for this body, most of which would be unnecessary with the existence of an effective legal regime, but some of which would be supplementary functions to such a regime, were it to exist. These would be functions such as training of

a comprehensive legal regime. The modern global reality is that governments have less and less money to spend on maintaining oversized bureaucracies and setting up more regulatory bodies is not an option for many of the world's states. The only separation of functions within the civil aviation structure which is essential here is that the body promoting air transport should be separate from the body enforcing aviation safety.[236]

Turning to the US experience, the FAA is the main body enforcing civil aviation regulations, using inspections as its only tool.[237] The aviation industry has grown so large, however, that this is no longer an effective weapon. This point is well-illustrated by the example of Valujet, the US airline whose DC-9 crashed into the Florida Keys due to what were later determined to be gross safety violations. This particular airline was inspected 5000 times by the FAA prior to this accident and not a single safety violation by the airline was detected.[238] Further doubt on the efficacy of the FAA safety inspection system has been raised by the US Government Accounting Office (GAO), which in a special report

> ...question[s] whether the FAA inspection system provides a meaningful measure of the aviation industry's compliance with regulations...60% of the inspectors surveyed said the FAA requires too much paperwork to start an enforcement case, even with minor violations.[239]

Moreover, a 1994 audit of Repair Stations inspected by the FAA conducted by the Office of

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inspectors, co-ordinating of unapproved parts reports, etc. See also, *AC 21-29B*, *supra* note 213 at 6.

[236] See Shiavo, *supra* note 3 at 90 *et seq*, for an illustration of the tension caused when the body promoting the financial health of airlines is the same body which has to police their safety violations, many of which have economic motives.

[237] *Ibid.*

[238] *Ibid.*

[239] Report dated 28 February 1998, cited in J. Mc Kenna, "GAO Cites Failings in FAA Inspections" (13 April 1998), http://www.aviationweek.com/safety/news/nz041398.htm (date accessed : 19 May 1998).

the Inspector General (OIG) of the US Department of Transportation found an alarmingly high number of unapproved parts in the stock of those repair stations. Indeed this audit even found that 39% of the FAA's parts stock for its own aircraft could be classified as unapproved.[240] Thus the question arises that if the US FAA, which currently employs 2700 inspectors[241] can't cope, how is a smaller, poorer country with less money and manpower to succeed in this endeavor?

Indeed, the FAA itself recognizes the limitations of the current system. The report of the so-called '90 Day Safety Review,' conducted in 1996 by FAA Deputy Administrator Linda Daschle, made the following observations : the current system for determining surveillance requirements and assigning resources is based on providing minimal levels of surveillance to all carriers, rather than targeting surveillance on an assessment of safety risk; the current use of geographic inspectors is inefficient; and the FAA and the aviation community should develop data collection systems and analytic tools to become more predictive and prescriptive about aviation safety issues.[242]

A significant improvement to the existing system has recently been proposed by the FAA. The FAA's Air Transport Oversight System (ATOS) plan is a model which might prove a very useful alternative to inspections for detecting unapproved parts. On the one hand, under the existing system, air carriers receive mandatory, scheduled inspections specified in an annual

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[240] See US, OIG Department of Transportation, *Report on Audit of the Certification and Surveillance of Domestic and Foreign Repair Stations, US Federal Aviation Administration (US Department of Transportation Report No. R4-FA-4-009)* (Washington DC : Department of Transportation, March 1994); "US Audit Finds Some FAA-approved Repair Stations Using Bogus Parts" [September 1994] Flight Safety Digest at 3.

[241] Schiavo, *supra* note 3 at 102.

[242] See (14 January 1998), http://www.faa.gov/ats/90day/report/report.htm (date accessed : 07 June 1998).

work programme. Additional inspections are carried out at the discretion of the carrier's principle FAA-assigned inspector. Therefore, the system is non-systematic and 'expert-based.' Its main disadvantage is that it relies excessively on the expertise of the inspectors assigned to a carrier. On the other hand, the proposed ATOS system, is a data-driven, systematic process. This system uses databases to identify safety trends and to direct inspectors where to direct their safety inspections.[243] For example, the system would direct an inspector to concentrate on unapproved parts at airlines with other safety violations, or to check the suppliers or distributors used when unapproved parts are found at an airline.

Irrespective of the inspection system used, the fact is that if the burden of detecting unapproved parts is spread out across the chain of parts distribution and onto those in the best positions to identify them (as is proposed in this study), and inspectors are no longer the only ones looking for them, then the flaws in the inspection system are compensated for. Former Inspector General of the US Department of Transportation, Maria Schiavo gives the following illustration:

> [w]e carted boxes of sample [unapproved] parts around with us, laid them out on tables and urged the airline maintenance people to take a good look. We need them, we said, to hold onto any similar...parts they found...[R]eport the [unapproved] parts and hang onto the evidence. *Almost immediately, reports of [unapproved] parts soared. They came in because mechanics noticed an odd color, or that metal edges were rough, or that boxes were improperly labeled.*[244]

Furthermore, it is important that, in addition to providing for an effective inspection system to enforce unapproved parts regulations, a legal regime should also allow for an effective reporting system[245] and publication of guidance material.[246]

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[243] *Ibid.*
[244] *Supra* note 3 at 108 [emphasis added].
[245] See *supra* at 75.
[246] See *infra* at 87.

Further regulatory aid which would assist in the enforcement of unapproved parts regulation is the authority to seize unapproved parts. Currently in the US, the FAA does not have clear authority to seize and destroy parts which are being misrepresented as being approved parts when they are not and the FAA Suspected Unapproved Parts Program Plan (SUPPP) suggests legislative action to obtain authority to seize and destroy offending parts, apart from any criminal proceedings. [247]

D. Effective, Proactive Prevention Mechanisms to Contain the Problem

The fourth element of the proposed national aviation anti-unapproved parts legal regime is that effective, proactive prevention mechanisms must exist. Indeed, consensus has developed that "preventing the manufacture or introduction of a bootleg part into commerce is as valid a control strategy as detection and elimination of existing parts or punishing offenders after the fact, and probably is less expensive on a unit basis."[248] It is true that the combined effect of the successful implementation of the other three proposed regime elements in the absence of specific prevention mechanisms will contribute to preventing the problem. For example, effective marking requirements will make parts more difficult to copy and effective enforcement mechanisms will serve to discourage potentially dishonest industry elements. Nevertheless, other measures beyond these remain necessary.

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[247] *SUPPP, supra* note 26 at 6-8.
[248] Luedemann, *supra* note 4 at 156.

1. Regulation of Parts Distributors?

Currently in the US, of the four links in the chain of aircraft parts distribution (Manufacturers, Distributors, Repair Stations and Operators), only three are regulated.[249] Therefore, the distribution of aircraft parts requires no prior licence or certification. Generally, the groups clamoring for the regulation of parts distributors are the same groups advocating an unbroken paper history to accompany all parts.[250] The proponents of this view emphasize a chain of accountability for aircraft parts which they say is broken at distributor level.[251] For example, it has been argued that the problem of unapproved parts has not reached the same proportions in the United Kingdom as in the US because parts distributors are regulated.[252]

The position of this study, however, is that regulating aircraft parts distributors will not eradicate the problem of unapproved parts for several reasons. Firstly, there is the practical consideration (as with the issue of inspections discussed already) that the regulation of distributors will place a further strain on the FAA's already stretched budgetary and manpower resources.[253] As the US

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[249] Stern, *supra* note 57.

[250] See discussion *supra* at 60.

[251] *Interpilot, supra* note 5 at 12; Flint *supra* note 184 at 46; *Flight Safety Digest Jan/Feb '94, supra* note 5 at 5. The (US) Airline Industries Association (AIA) asked the FAA in 1978 and again in 1988 to tighten its regulation of the sale and distribution of parts, *ibid.* Bajak, *supra* note 1. In 1994 the (US) Airline Suppliers Association (ASA) asked the FAA for the same thing. *Ibid; SUPPP, supra* note 26 at 6-4. According to Broderick, though, the airlines and Original Equipment Manufacturers (OEM's) at the forefront of this drive to get distributors regulated, have ulterior motives : some distributors feel that these efforts are "an attempt by the primes to close down alternative sources of parts and capture more spares business at a time when...[the prime manufacturers] are not selling a lot of planes;" and "although the airlines are clamoring for regulation of suppliers to eliminate the bad apples, they are also shopping for the lowest bid rather than building long-term relationships with distributors who have introduced the kind of quality assurance they want." Cited by Flint, *supra* note 184 at 46.

[252] *Flight Dafety Digest, supra* note 5 at 5, citing V. Brennan (Civil Air Attaché to the British Embassy in Washington DC).

[253] Bajak, *supra* note 1, citing A.Broderick. "There are several thousand parts brokers and distributors and regulating all of them would be a monumental task." *Ibid.* Besides, the FAA "does not have enough money or inspectors to monitor...parts distributors and brokers." *Flight Safety Digest Jan/Feb '94, supra* note 5.

Airline Suppliers Association has stated, "...[w]e are concerned that people are focusing too much on regulation as a solution, whereas regulation by itself doesn't accomplish anything rather than adding a layer of bureaucracy."[254] Thus the solution is to ensure that errant distributors' actions are adequately targeted under effective prohibitions, such as those proposed in this thesis, which apply to all persons and not only to those regulated by the FAA.[255] Additional regulation of these persons should then be unnecessary.

A second reason for not instituting a policy of regulating parts distributors is that, as with the enforcement of anti-unapproved parts regulation, the onus to prevent these parts from entering the system is first and foremost on the industry itself. Therefore, an alternative to regulation of distributors is the FAA's Voluntary Industry Accreditation Programme.[256] According to this system, distributors are accredited by a third party other than the part's manufacturer[257] or by civil aviation authorities. This programme overcomes two problems with the surveillance of distributors by manufacturers. First, past experience has shown that in practice only a very small percentage of parts distributors are actually designated by manufacturers as authorized. Second, a problem would arise either if a manufacturer ceased operations, or (in the case of aircraft no

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[254] Flint, *supra* note 185, citing E. Gluecker of the US Airline Suppliers Association. See also Elliot, *supra* note 90.

[255] See *SUPPP*, *supra* note 26 at 5-4, 6-5, 6-6. Although, as Broderick points out, existing criminal fraud statutes in the US have not deterred distributors from knowingly selling counterfeit or fraudulently documented parts. Cited by Flint, *supra* note 184 at 46. This does not however take away from the fact that regulation is not a solution.

[256] See *AC 00-56*, *supra* note 196. Lange and Thomas, *supra* note 200 at 6, nevertheless see this programme as a form of FAA regulation. This cannot be agreed with however, since at this stage the FAA's Voluntary Industry Accreditation Programme is not a binding requirement on distributors and even if it were (as is proposed by this study, see *infra* at 84) action is not required by the FAA but by third-party oversight bodies.

[257] An alternative possibility to regulation of distributors is that Original Equipment Manufacturers (OEM's) accredit certain distributors of their parts and also implement systems such as part serial number/subsequent history bulletin boards. See Luedemann, *supra* note 4 at 137; and General Electric Aircraft Engines' Worldwide Engine Network, *supra* note 77.

longer in production) a manufacturer did not have the information or personnel with the knowledge to conduct such surveillance.[258] In addition to avoiding these two problems, the FAA programme also does not increase the burden on the already limited FAA budget.[259]

The reasoning behind the FAA's Voluntary Industry Accreditation Programme is that third-party accreditation provides assurance to a parts purchaser that a distributor has implemented an appropriate quality system and has demonstrated the ability to maintain that system. Parts procured from such a distributor will convey the assurance to the purchaser that the parts are of the quality stated and true according to their required documentation.[260] These third parties are called Quality System Standard Organizations (QSSO's). A distributor would apply to such an organization for an audit of its premises and systems. These Organizations would then maintain a database of all distributors audited and found to be acceptable and potential parts purchasers would just need to consult these databases. An example of such a QSSO is the US Airline Supplier's Association.[261]

A problem with the programme as it stands, is that it is voluntary and "...something that could suffer as a result of current pressure on prices. Safety measures of this type should [therefore] be prescribed by law and should not be contingent upon the size or quality philosophy of an airline."[262]

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[258] *SUPPP, supra* note 26 at 6-5.
[259] *AC 00-56, supra* note 197 at 4.
[260] *Ibid.*
[261] See (date unknown), http://www.airlines.com/page02.html (date accessed : 25 June 1998).
[262] *Interpilot, supra* note 5 at 12.

2. Prescription of Quality Control Procedures[263]

A second measure to effectively prevent and contain the problem of unapproved parts is that authorities should mandate the implementation of effective quality control procedures by aviation industry elements. As one commentator has stated : "*[i]l faut..que les opérateurs effectuent régulièrement leur propre audit qualité chez les réparateurs.*"[264] It is however, not only the operators which need to have quality checks on the Repair Stations they use. Indeed every industry element needs to check up on every other industry element it deals with, and even needs to check up on itself to guard against dishonest employees.

This element of the legal regime proposed in this thesis is one which is required quite thoroughly by existing regulation.[265] Several publications provide guidelines as to what these quality control procedures should entail.[266] For example, they usually prescribe checking the background of suppliers, inspecting parts on reception for bad finishing, noting unusually low prices etc. However, these publications usually neglect to specifically address an important unapproved parts preventative measure, namely guarding against part theft. This would involve not only direct measures (such as checking employees before leaving the premises or tightening security systems) but also indirect measures, such as maintaining strict records of part

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[263] See, generally, Luedemann *supra* note 4 at 156.

[264] Beauclair, *supra* note 4.

[265] See US, 14 C.F.R. s. 21.139, s. 21.143, s. 21.147 with regard to "Certification Procedures for Products and Parts - Quality Control"; Canada, for example, SOR/96-433, s. 573.09 which provides that "Approved Maintenance Organisations shall establish a quality assurance programme."

[266] See *ATA Spec.106, supra* note 7 at Chapter 3; *Unapproved Parts Handbook, supra* note 228 at Part 3.

whereabouts and movements.[267] Regulations addressing quality control procedures should also expressly cover the redocumentation of undocumented parts which are currently in stock.

3. Authority Response to Unapproved Parts Reports

A third important proactive and preventative measure is that there should be effective authority response to reports of unapproved parts. In addition to the role that a requirement to report unapproved parts plays in contributing to enforcement of unapproved parts regulations, such a requirement also places the authorities that receive the reports in a position to take preventative steps if necessary. Therefore it is important that the legal regime explicitly prescribes steps to be taken by authorities on receipt of such reports. Appendix B of the *Canadian Airworthiness Manual* is an example of such a provision since it lists examples of action which can be taken when Service Difficulty Reports (the system under which discoveries of unapproved parts must be reported in Canada[268]) are made. This may include amending regulations, criminal prosecution, issuing binding directives, publication of advisory material and information dissemination.

The binding measures which an authority might institute are usually called Airworthiness Directives (AD's).[269] The steps resulting in an Airworthiness Directive being issued often start when a prime manufacturer becomes aware of a problem which occurred with regard to one of its products after sale. At this point, the manufacturer will issue what is called a Service Bulletin

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[267] See discussion *infra* at 97 regarding the importance of record-keeping with regard to combating parts theft.

[268] See discussion *supra* at 76.

[269] See US, 14 C.F.R. s. 39.

to all known users of the same product, detailing the causes of the incident and steps to be taken to prevent a recurrence. These bulletins are not binding. However, if the problem is sufficiently serious, the manufacturer may ask the civil aviation authority to issue an Airworthiness Directive (which is indeed binding) to the same effect as the Service Bulletin.[270]

Advisory measures and material[271] are also especially relevant and useful tools for authorities in their response to unapproved parts reports. They not only explain the application of the contents of the binding legal regime to enforcers such as inspectors, but they also advise industry elements on their obligations with regard to the problem. Advisory measures and material can also be used to advise the industry on lessons learnt and other data gained from processing reports of unapproved parts. Furthermore, such advisory material may take many forms. However, the form of the material itself is not really legally relevant. It suffices that binding regulations provide, for example, that the authority receiving the report be empowered to publish any material it deems necessary in the interests of combating unapproved parts. This material could be in the form of manuals,[272] bulletins,[273] video programmes,[274] databases,[275]

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[270] This would have been the process followed by United Airlines, Pratt and Whitney and the FAA in the case of the counterfeit JT8D seal spacers in the case referred to at the beginning of this paper. The process's potential success at preventing catastrophe was well illustrated in that case. See *supra* note 1.

[271] See discussion *supra* at 51.

[272] Several FAA Advisory Circulars (AC's) fall into this category. The following are examples which are relevant to unapproved parts: *AC 21-29B, supra* note 213; *AC 00-56, supra* note 196; AC 20-62 "Eligibility, Quality, and Identification of Aeronautical Replacement Parts"; AC 21-20 "Supplier Surveillance Procedures"; and AC 21-38 "Disposition of Unsalvageable Aircraft Parts and Materials".

[273] The FAA issues bulletins called Flight Standards Bulletins (FSB's) to its inspectors to alert them to any specific problems. Unapproved parts-relevant FSB's include FSAW 96-06-A "Damaged and Suspected Unapproved Parts Entering the Surplus Sales Market"; and HBAW 95-13-A "Maintenance of Restricted Category Surplus Military (RCSM) Aircraft."

[274] For example, "Seek Out, Speak Out, Wipe Out - Unapproved Parts", video produced by Transport Canada, publication number TP 13009.

[275] See the SUPPP PRS, *supra* note 234. This system's database is accessible through the Internet and the following is an example of the type of information it provides :

> [t]his notice is to advise all owners, operators and maintenance entities of improper work performed by Aero Power, Inc...between October 1996 and January 1997...If work was accomplished [by the above

seminars or training programmes.[276]

4. Targeting Military Parts

It is necessary that as part of preventing and containing the problem of unapproved parts, the national legal regime address the entry of ex-military parts into the civilian sector. Earlier in this study, the threat posed to civilian aviation by substandard or undocumented military parts entering the market was shown in some detail.[277]

The proposed US solution to this problem is to identify Flight Safety Critical Aircraft Parts (FSCAP's) among military parts and to require that certain rules be adhered to regarding the control over and disposition of these parts. A recent plan developed jointly by the FAA and The US Department of Defense (DoD) noted that some of the following actions would be required: outlining a process for identifying dual-use FSCAP's (ie. parts which were eligible for use on both civilian and military aircraft); determining appropriate documentation to accompany all FSCAP's at the time of disposal from the DoD inventory; and installing a process whereby FSCAP's lacking documentation are mutilated.[278] Although the regulations addressing these

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company], the following should be done : (a) [t]he part or component should be inspected and checked for serviceability and conformity...

(02 April 1998), http://www.faa.gov/avr/fn97-279.txt (date accessed : 07 June 1998). There are several commentators who feel that the establishment of an unapproved parts database is a stand-alone solution for the unapproved parts problem. See Elliot, *supra* note 90, citing the example of the independant US company, Avmark Inc., which proposes to administer a system on behalf of the authorities called the Aircraft Parts Authentication and Tracking System (APATS). This system would combine modernized parts marking technology (see *supra* at 59) fed into a parts database. See Luedemann, *supra* note 4 at 141 for a discussion of the merits of this system. The merits of such a system are beyond the scope of a legal study such as this one, but that it could replace an effective legal regime as a means to combating this problem is doubtful.

[276] See *SUPPP, supra* note 26 at 9-1.

[277] See *supra* at 18.

[278] See *SUPPP, supra* note 26 at 6-14.

issues would likely not be contained in the national transportation/aviation regime, they are discussed here for the sake of completeness. In the US, such regulations would probably fall under the Federal Property Management Regulations (the FPMR's).[279]

5. Re-certifying Undocumented Parts

The fifth preventative measure which the national legal regime must contain is one addressing the problem of recertifying undocumented unapproved parts. As discussed earlier in this study, undocumented parts should indeed be considered unapproved parts and therefore ineligible for installation on type certificated aircraft. However, there might literally be millions of such parts in existence today both installed on aircraft and in the parts stocks of repair installations across the world.

On the one hand, this thesis proposes an obligation to take preventative steps on discovery of unapproved parts. This obligation, combined with already existent periodic maintenance,[280] would see such undocumented parts removed from aircraft once discovered. In addition, mandatory quality control audits would oblige repair installations to guard against purchasing such parts or maintaining such parts in their stock.

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[279] US, 41 C.F.R. sub-title C. See "Proceedings of (US) General Services Administration (GSA)'s Government-Industry Aviation Parts Forum" (08 April 1997), http://policyworks.gov/org/main.mt/ library/ mta/ form.htm (date accessed : 06 June 1998); and "Report of Flight Safety Critical Aircraft Parts Process Action Team" (Paper presented at (US) Airline Suppliers Association (ASA) Annual Conference, 20-22 July 1997) [unpublished].

[280] See *supra* at 72.

The question arises, however, as to what should be done with these parts once they are identified. Since they qualify as unapproved parts, they need to be addressed in some way as part of preventing or containing the problem. Clearly destroying them is not a realsitic option since they might be approved and usable eventually. Furthermore, there would be a great financial implication considering the great numbers of these parts currently in existence.

In view of the above constraints, the solution involves a regulatory process for allowing for the redocumentation of these parts.[281] This subject is addressed in considerable detail in the SUPPP and in a proposed FAA Advisory Circular *Determining Disposition of Undocumented Parts*.[282] However, the legal regime in this thesis presents a simpler solution than that proposed in these two US documents.

First, in terms of the legal regime proposed in this study, reliance on parts documentation would be reduced since documentation would be supplemented by a duty to take "reasonable steps to identify" parts being placed on all persons who handle aircraft parts.[283] This would mean that many undocumented parts could be identified on discovery by means of 'reasonable steps' as approved parts, making redocumentation unnecessary. Second, in terms of the legal regime proposed in this study, differing documentary requirements for different classifications of parts would simplify the extent to which redocumentation was required for many parts.[284]

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[281] Hedrick, *supra* note 4 at note 72, points out that currently in terms of US regulation the only way to reintroduce such parts would be to have them re-approved from the start according to the formal design and manufacturing approval regulations as if they were new parts. This could take considerable time and would place considerable burden on the party seeking approval.*Ibid.*

[282] *SUPPP*, *supra* note 26 at 6-11, citing FAA Advisory Circular AC 20-XX.

[283] See *supra* at 57.

[284] See *supra* at 61.

As a matter of interest, the duty to take steps to prevent unapproved parts from becoming available for installation which is proposed above[285] could be also be fulfilled by documenting an undocumented part, thereby making it an approved part available for installation.

Thus the only measure required in addition to the anti-unapproved parts regime already proposed above would be a measure granting of statutory authority to certain entities to recertify those parts which do have a documentation requirement. An example of such a measure in Canada is a proposed change to Canadian Aviation Regulation (CAR) 573.02. In terms of this proposal, special Approved Maintenance Organization (AMO) Certificates would be issued to Repair Stations (after a suitable check and audit) allowing them to recertify undocumented parts.[286] This proposed regulation would be be supported by the proposed addition to Appendix H to Chapter 571 of the *Canadian Airworthiness Manual* of a "Procedure to Re-certify Undocumented Parts." This procedure would prescribe a process of tests depending on the nature of the part and including, for example, visual comparisons with documented parts, hardness tests etc. If a part is found to conform to its Type Design and applicable regulations (such that if it fits the definition of an approved part proposed above), new documentation can be issued.

E. Proposed Changes to National Transportation/aviation Regime : a Reality Check

When viewed against the background of the proposed national transportation/aviation regime, there are clearly deficiencies in the US and Canadian approaches toward unapproved parts, even

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[285] See *supra* at 72.
[286] *CARAC Report, supra* note 160.

though they are probably the two national regimes in the world today which address the problem of unapproved parts in the most detail. Therefore, this thesis has proposed several regulatory changes. However,

> [f]ashioning an effective programme of controlling the excesses of the aircraft industry must cope with the political realities as they are found in the post-modern era. Thus, a programme which argues for a significant increase in agency costs or regulatory burdens faces the prospect of an uphill battle for funding in an era of declining budgets, deficits, and government deconstruction.[287]

Therefore, the advantage of the regime proposed here in this paper is that it does not rest on the implementation of expensive unapproved parts 'plans,' 'programmes' or separate bodies. Rather this proposal emphasizes revamping existing regulations and properly implementing them with already existing bodies and programmes. In some cases, these proposed changes would actually lead to less money being spent, but money being spent more effectively.

Pragmatic objections to 'simple' regulation changes nevertheless also exist. As an FAA official has pointed out, proposed rule changes must be simple, otherwise they could take up to four years to pass through the necessary processes.[288] It is felt nonetheless that the regulatory changes proposed in this paper are indeed simple enough. In most cases, the regulatory provisions proposed comprise no more than three to four lines and in some cases could serve to replace much more detailed existing provisions.[289]

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[287] Luedemann, *supra* note 4 at 155.

[288] "FAA Reveals Plans to Deal With Bogus Parts" (21 October 1995), http://www.avweb.com/newswire/news9512.html (date accessed : 07 June 1998), citing N. Sabatini.

[289] See *supra* at 69-71, for example.

II. NON AVIATION-SPECIFIC CRIMINAL LAW REGIME

Despite the failure of current national transportation/aviation regulation to satisfactorily address the issue of unapproved parts, non aviation-specific criminal law provides a reasonably effective interim measure. In fact, most of the actions surrounding unapproved parts identified above are likely covered by some existing criminal act. For example, not only the failure to report unapproved parts is already covered (under aiding and abetting a criminal act) but also the failure to effectively dispose of unapproved parts (under endangering the safety of aviation).

Addressing these acts under their own specific regime remains necessary however since, as will be seen below, all of the existing criminal acts (with the sole exception of manslaughter) require specific intent as fault and that there is an argument for extending the fault requirement when it comes to unapproved parts has already been shown.[290] Nevertheless, the following criminal acts can be envisaged in an unapproved parts context : trademark infringement; fraud; theft; murder/manslaughter; criminal damage to property; and violation of customs statutes.

A. Trademark Infringement

In the US, at the federal level,[291] criminal trademark infringement is subject to the *Trademark Counterfeiting Act*[292] of 1984, recently amended and supplemented in 1996 by the *Anti-*

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[290] See *supra* at 63.

[291] There are several US states which have also now begun to enact their own anti-counterfeiting legislation. An example of this is the Texas House Bill No. 1613, 75th Leg., R.S. (1997). See Maynard and Moak, *supra* note 84 at 5.

[292] 18 U.S.C. s. 2318-20.

Counterfeiting and Consumer Protection Act.[293] The effect of these two acts is to prohibit "trafficking"[294] in products with counterfeit trademarks. Trafficking includes the making, disposing of or otherwise gaining control of a product.

However, there are several limitations of these provisions with respect to unapproved aircraft parts. First, their application is restricted to the use of actual registered trademarks.[295] Thus it is conceivable that a counterfeit aircraft parts manufacturer might escape prosecution, simply by refraining from copying a trademark on to the unapproved part.[296] The emphasis on specific trademarks by the above provisions also restricts their application to unapproved parts cases for a further reason. The counterfeiting of aircraft parts is to be contrasted to the counterfeiting of other products since in many cases it is exactly this false mark which sells these other products. For example : sewing the label and trademark of a well-known brand onto a pair of jeans manufactured by someone other than that well-known manufacturer is what attracts the customer to the counterfeit product. Indeed if one was to remove the label, the product probably would not sell.[297] On the other hand, aircraft parts are different. With the existence of manufacturers with Parts Manufacturing Approvals (PMA's) alongside the Original Equipment Manufacturers (OEM's), a customer is not always looking for a specifically *branded* part and rather most often just for a part of a specific *type*. Furthermore, what protection do these provisions offer in the case of standard parts, where an aircraft part is too small to attach a

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[293] Public Law 104-153 [S. 1136].
[294] 18 U.S.C. s. 2320(e)(2).
[295] *Ibid.* at s. 2320(e)(1).
[296] For the purposes of aircraft parts other marks such as part numbers or inspection stamps might also qualify as trademarks See *infra* at 127.
[297] See Kiesel, *supra* note 91.

mark? In addition, only "knowingly" counterfeiting a trademark is prohibited.[298]

Nevertheless, there are certain advantages provided by the *Anti-Counterfeiting and Consumer Protection Act.* First, it provides some very effective sanctions and enforcement mechanisms, including extensive jail sentences, fines and asset forfeiture. Second, this Act not only prohibits re-exportation of counterfeit goods but also allows for the seizure and destruction of offending goods (unless the trademark holder desires alternative disposition).

Lastly, under the crime of trademark infringement, it might also be possible in terms of US law to recognize trademark counterfeiting with respect to unapproved parts as a type of forgery or "criminal simulation."[299]

B. Fraud

The prosecution of the criminal offence of fraud is the measure which has been successfully invoked in the US to counter specifically those persons who misrepresent unapproved parts as approved or who forge parts documentation. US federal law describes fraud as follows :

> [w]hoever, in any matter within the jurisdiction of any department or agency of the United States *knowingly and willingly* falsifies, conceals, or covers up by any trick, scheme or device a material fact, or makes any false, fictitious or fraudulent statements or representations, or makes or uses any false *writing or document* knowing the same to contain any false, fictitious or fraudulent statement or entry, shall be fined under this title or imprisoned for five years or both.[300]

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[298] 18 U.S.C. s. 2320(e)(2).
[299] Luedemann, *supra* note 4 at 144.
[300] 18 U.S.C. at s. 1001 [emphasis added]. See also Burt, *supra* note 4 at 866-9.

The rules on fraud are reinforced by the rules on wire fraud if a telephone was used in the misrepresentation,[301] or by the rules on mail fraud if the US postal system was used.[302]

These provisions have been interpreted to be broad enough to cover not only the oral representation of unapproved parts as approved but also the forging of parts documentation. Moreover, the prohibition against "false writing or document[s]" could easily be construed to include falsifying part etchings, engravings or identification plates. Fraud would also be an effective measure against part rebuilders or vendors of unapproved standard parts who "cover up" the true status (ie. a "material fact") of their parts.

Once again unfortunately, though, only "knowingly" fraudulent acts are covered.

C. Theft

The criminal offence of theft can be invoked to target several types of unapproved parts, namely salvaged parts taken from a wreckage without the operator (or their insurer)'s permission; reject or surplus parts removed by employees; and also stolen parts. The US law covering the crime of theft distinguishes two types of theft offences, both of which can be envisaged in an unapproved parts scenario.

Firstly, there is the crime of Larceny. Larceny involves (1) the trespassory (2) taking and (3)

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[301] 18 U.S.C. at s. 1343.
[302] *Ibid* at s. 1341.

carrying away of the (4) personal property (5) of another person (6) with the intent to steal it.[303] The requirement that the relevant property be 'stolen and taken away' requires that it be shown that the owner has suffered the *loss* of the property. Thus in the aviation part environment, proper record keeping and tracking of parts as a quality control system by operators and Repair Stations is very important. This is illustrated by the case of a parts distributor who was arrested and confessed to selling stolen parts.[304] The parts were recovered and identified as belonging to a Latin-American carrier. However, the airline was unable to produce the paperwork showing that it owned the parts. Since it was unable to show a loss, therefore, and despite a signed confession, the broker escaped punishment.

Secondly, Embezzlement is a forbidden theft offense. Embezzlement involves (1) the fraudulent (2) conversion of (3) the property (4) of another (5) by one who is already in lawful possession of it.[305] This would include employees who have an employers property in their possession or in their care as part of their duties. Therefore this offence covers not only reject and surplus parts stolen from parts manufacturers, but also Repair Station employees who steal parts from the stock of their employers. The only question which comes to mind is whether reject parts would fall under 'property of another,' having been discarded by the manufacturer. However, this is unlikely to be a problem since even reject parts would have value as scrap metal. Thus manufacturers would probably not abandon such parts, preferring to re-enter them in the manufacturing cycle.

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[303] W. LaFave and A. Scott, *Handbook on Criminal Law*, 2nd ed. (St. Paul, Minnesota : West Publishing Co., 1986) at 707.

[304] Nelms, *supra* note 47.

[305] LaFave and Scott, *supra* note 303 at 735.

D. Murder/Manslaughter

The next potential criminal offences to consider as possibly arising in an unapproved part environment are murder and manslaughter.

One possible, though unlikely, scenario is that a person could knowingly install a sub-standard unapproved part on an aircraft, intending it to fail and cause an accident and the death of a person while *knowing* that the part would indeed fail. In such a scenario, the part installer would be guilty of murder.

A second and more likely scenario is that of a Repair Station knowingly installing an unapproved part, aware only of the *chance* that it would fail,[306] but installing it anyway, thereby being guilty of manslaughter. Indeed the offense of manslaughter is the only act under the current criminal law regime surrounding unapproved parts where something less than specific intent is required.[307] An example of the prosecution of manslaughter in an unapproved parts scenario occurred in November 1997. In what is thus far a world first with regard to unapproved parts prosecutions, a parts distributor who sold rebuilt timed-out helicopter blades which failed and caused a helicopter to crash, resulting in two deaths,[308] was convicted of

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[306] According to the proposition that the standard in the aviation industry has been raised so that all elements ought to be aware of the dangers of unapproved parts, this should not be difficult to prove. See *supra* at 63.

[307] Even though this is 'reckless' conduct (or gross negligence) and not yet the pure negligence argued for in this thesis. *Ibid.*

[308] See *supra* note 76.

manslaughter by a New Zealand Court.[309] This is an exceptional ruling, however. To have succeeded in the conviction of the distributor in the case at hand, it would have had to have been proved that he knew that the parts he was selling would definitely be installed on an aircraft *and* then that they would fail and cause an accident and resulting loss of life. This is a difficult burden of proof to overcome and in most cases, therefore, it is submitted that the most likely accused for a charge of manslaughter would be the part installer and not the part's seller. It is doubtful whether, according to the facts, in every accident caused by an unapproved part there will be sufficient intent and causal link to convict any parties beyond the part installer in the unapproved parts chain of manslaughter.

E. Criminal Damage to Property

A fifth possible criminal offence that may be applied in an unapproved parts environment is criminal damage to property, also called Malicious Mischief, Criminal Mischief, Vandalism or Criminal Tampering.[310] This crime involves the malicious injury to or the destruction of the property of another.[311] It is required that the doer knowingly cause such damage.[312]

Some US jurisdictions require the element of physical injury to or destruction of the item of property in question, so as to render it unfit for its intended purpose. This would render the

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[309] At the time of writing, this case has not yet been reported. See, however, D. Learmount, "Loss of Control" [15 April 1998] Flight International; "Bogus Parts Case Results in Manslaughter Conviction" [February 1998] Business and Commercial Aviation 24; and "Selling Bogus Parts Equals Manslaughter in New Zealand" [16 January 1998] Helicopter News.

[310] C. Torcia, *Wharton's Criminal Law, Volume IV*, 14th ed. (San Francisco : Bancroft-Whitney, 1981) at 89.

[311] *Ibid.* at 87.

[312] *Ibid.* at 93.

installer (or any other party in the chain of distribution if the required causal link and intent could be proved) of an unapproved part which failed and caused damage guilty of a crime in those jurisdictions. This would be on condition that he did so knowingly and intending it to fail and cause damage to the aircraft it was being installed on.

However, in some jurisdictions the scope of the conduct covered by the offence has been broadened include "defacing", "tampering" or "altering"[313] someone else's property. This would open the way for the conviction of an installer who knowingly installed an unapproved part on an aircraft even if it does not fail and cause any damage to the aircraft, since such installation could easily be construed as 'defacing' or 'tampering'.

F. Contravention of Customs Statutes

Certain states, such as the US, not only prohibit the manufacture of counterfeit goods under their trademark laws, but also prohibit the importation of such products into their territory under their customs laws.[314] Given that aircraft and their parts today are manufactured in only a relatively small number of states, it is likely that the biggest unapproved parts problem faced by most countries will be from outside their own borders. In addition, the established aviation manufacturing countries are also threatened from abroad since the rise in third world counterfeiting alluded to earlier. Thus effective customs legislation is becoming a much needed weapon specifically against counterfeit unapproved parts.

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[313] *Ibid.*

[314] Maynard and Moak, *supra* note 84 at 4.

At this point, it is worth noting that an important US customs rule is that trademarks can be recorded with the US Customs Service for comparison with marks affixed on incoming goods. In the absence of written consent from the trademark owner, all incoming goods bearing the same mark can be seized and destroyed.[315] Furthermore, a person assisting or directing importation of counterfeit goods is subject to the same fines.[316] Another US customs intervention possibility is that where the importation of a particular counterfeit product is particularly ubiquitous and the product is entering through several ports, the trademark owner can apply to the US International Trade Commission to have the import of that product banned.[317]

The European Union approach is different from that of the US, however, and may present a problem.[318] According to Article 30 of the Treaty of Rome, free movement of goods between member states is enshrined as primary and self-executing European Economic Community law. Thus, for example, if a particular counterfeiter was operating out of Spain, then France would not be able to ban the import of his products. Fortunately, Article 36 of the Treaty allows for national exemptions to the free movement of goods for the purpose of order and safety and health and life of humans.[319] This thesis has demonstrated that unapproved parts can indeed be considered dangerous and banning the import of such parts might therefore still be a possible

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[315] *Ibid.* citing 19 U.S.C. s. 1526 (a),(e),(f); 15 U.S.C. s. 1124; and 19 C.F.R. s. 133.

[316] *Ibid.*

[317] Maynard and Moak, *supra* note 84 at 4, citing 19 U.S.C. s. 1337. The problem however is that this is actually an ineffective procedure, since it is extremely costly and can be avoided by the counterfeiter simply by mismarking containers. Maynard and Moak, *ibid.* See also A.Katz and E. Cohen, "Effective Remedies Against the Importation of Knock-offs : A Comparison of Remedies Available from the International Trade Commission, Customs and Federal Courts" [1984] Journal of the Patent Office Society 66, cited by Maynard and Moak, *ibid.*

[318] Kaiser, *supra* note 4. See *Treaty Establishing the European Community (as amended)*, 1 July 1993, 1995 B.D.I.E.L. AD LEXIS 96.

[319] *Ibid.*

solution in Europe.

G. Miscellaneous Other Criminal Violations

The last group of criminal offences in an unapproved parts environment are what may be called "technical criminal violations."[320] Many of these offences have been applied very successfully by particularly the US Department of Transportation's Office of the Inspector General in their prosecution of unapproved parts offenders.[321] Such violations have included the following : aiding , abetting or willfully causing an offence to be committed against the US;[322] endangering the safety of aircraft in flight;[323] conspiracy to commit an offence against the US;[324] interstate transportation of stolen property valued in excess of US$ 5000 with intent to defraud;[325] and making a false declaration on US customs documentation.[326] An additional possible offence in this environment would be knowingly receiving stolen property.[327] The advantage of some of these 'technical' violations is that negligence might be enough for a conviction. For example, if a supplier receives an unauthorized part that has been represented to him as airworthy, and he passes the part along as airworthy then technically, he has just aided and abetted a felonious act.[328] On the other hand the disadvantage of these technical violations is that for many of them, the prescribed penalties are not heavy enough.

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[320] Lange and Thomas, *supra* note 200 at 18.
[321] Luedemann, *supra* note 4 at 146.
[322] 18 U.S.C. s. 2.
[323] *Ibid* at s. 32.
[324] *Ibid* at s. 371. See Kiesel, *supra* note 91 at 63.
[325] 18 U.S.C. at s. 2314. See Kiesel, *ibid.*
[326] 18 U.S.C. s. 542.
[327] LaFave and Scott, *supra* note 303 at 765.
[328] Lange and Thomas, *supra* note 200 at 18.

CHAPTER 5

NATIONAL LEGAL REGIME - PRIVATE LAW

I. GENERAL ASPECTS

The following consideration of the national private law regime as a tool in the fight against unapproved parts will not only focus on litigation aspects (to equitably settle the private claims which arise out of the existence of unapproved parts). Other general private law aspects are also relevant, not only in terms of preventing such claims from arising, but also in terms of controlling the effects of unapproved parts outside the courtroom.

The first point which arises is the effect of unapproved parts on insurance-related aspects. As will be shown below, in a typical unapproved parts scenario, it is likely that all the elements along the chain of unapproved part manufacture and distribution can be targeted under some form of civil liability. Even 'honest' persons might be liable under certain circumstances (such as where strict liability exists). Thus, all aviation industry elements should insure adequately against liability for damage caused by unapproved parts. This should not however serve as an excuse fro the industry to relax its guard against unapproved parts on the premise that they are safely insured. This is because most aviation liability insurance policies today contain certain exclusions from liability in the event that the insured aircraft is operated in violation of applicable rules or regulations.[329]

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[329] Ludemann, *supra* note 4 at 126. See also R. Brazener, "Risks and Causes of Loss Covered or Excluded by Aviation Liability Policy" [1978 & Supp. 1995] 86 A.L.R. 3d. 118, cited by Luedemann, *ibid.* Presumably, this should not cover only *aviation* regulations, since presently, as has been discussed already, not

In addition to insurance protection, explicit contractual protection is also an important tool in protecting against the effects of unapproved parts. Therefore, in addition to the *ex lege* contractual warranties which will be discussed later, it is important that all parties in any contract where aircraft parts are involved (whether for purchase or installation), expressly negotiate effective protection and penalties in case of unapproved parts being involved. The Canadian *Unapproved Parts Handbook* addresses this question in some detail.[330] These protection and penalty clauses could be contained in Purchase Orders, Contracts or Quality Assurance Provisions.[331] A sample statement would be the following :

> The seller is responsible to provide a product that conforms to all applicable specifications and regulations. The buyer reserves the right to recover all costs and damages incurred for unapproved parts (subject to investigation and possible civil penalty).

Effective warranty protection is also especially important in aviation. This stems from air operators' vulnerability to pure economic loss. Examples of this type of loss are lost earnings for aircraft time on the ground and loss caused by diminished consumer confidence in an airline after an accident. This need to ensure adequate warranty protection is because it has happened in the past that operators have been refused claims for pure economic loss by the courts on the grounds that the operators should have bargained for more effective warranty protection.[332] Nevertheless contractual freedom is an established principle and it has been a practice for parts distributors to expressly exclude any warranties protecting the purchaser should they buy

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all unapproved parts actions are indeed prohibited under those regulations. See also, generally, regarding insurance aspects with regard to unapproved parts, Lange and Thomas, *supra* note 200 at 35.

[330] *Supra* note 228 at 1-2.

[331] *Ibid.*

[332] P. Kolczynski, "Aviation Product Liability" (27 October 1997), http://www.avweb.com/articles/prodliab.html (date accessed : 27 June 1998).

unapproved parts from those distributors. A sample clause is the following :

> 18. INDEMNIFICATION
> Consignor agrees to indemnify and hold [distibutor] harmless for any liability arising out of [distributor's] sale of Consignors defective, improperly tagged or bogus parts.[333]

Although, such exclusions would usually be permissible between two parties of equal size and bargaining power,[334] it is unlikely that such exclusions would be permissible towards all subsequent parties in the unapproved parts chain, such as the eventual operator who suffers damage from the failure of a part. This is especially so in the case of exclusion of *ex lege* warranties.[335]

Of course, with regard to counterfeit parts, the Original Equipment Manufacturer (OEM) cannot be bound by any warranty made on his behalf with regard to the counterfeit part by the counterfeiter. This has happened before in a case where Pratt and Whitney received warranty claims for parts they had not manufactured.[336]

II. LITIGATION ASPECTS

In addition to the effect of unapproved parts on the incidental private law questions outlined above, these parts are definitely a cause of litigation between private parties. As two writers have stated :

> [a] manufacturer that desires to protect its markets and reputation...must step into the

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[333] "Consignment Agreement for Aviation Parts between AV-PAC and Consignor" (30 March 1997), http://www.avpac.com/csagree/html (date accessed : 27 June 1998).

[334] In the US, see for example, *Delta Air Lines Inc. v. Mc Donnell Douglas Corp.*, 13. Avi. 17 510.

[335] In the US, see for example, *Henningsen v. Bloomfield Motors*, 161 A. 2d. 69.

[336] Leggett, *supra* note 60 at 56.

> breach created by lagging public action. The war against counterfeiters can only be won through vigorous participation of the manufacturers.[337]

Action by private persons in the fight against unapproved parts is not limited to Original Equipment Manufacturers (OEM's) against counterfeiters however. As will be seen below, all those affected by unapproved parts (whether in terms of physical harm or otherwise) have civil claims against several of the elements along the chain of unapproved parts manufacture and distribution. All injured parties have a duty to use the judicial remedies available to them in achieving two aims : compensation for infringement and discouragement of future action.[338]

The myriad of claims and litigants possible in an unapproved parts scenario can be illustrated in the following hypothetical example :[339]

A California, US. aircraft manufacturer called Norton Industries builds a wide-bodied jet called the N-22. An N-22 is bought by a Hong-Kong based carrier called Trans-Pacific Airlines (TPA). During a flight to Los Angeles from Vancouver, the N-22 suffers a slats deployment in flight (slats are extendable panels on the leading edge of an aircraft's wing which are used to increase the wing surface for extra lift at the low speeds of take-off and landing). The deployment of the slats at cruise speed at 37 000 feet causes the aircraft to go through a series of violent pitch oscillations and sudden loss of height, before resuming normal flight when the autopilot corrects the problem. The result is the death of three passengers and the injury of fifty-seven people on board. The incident is investigated and three unapproved parts are discovered on the

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[337] Maynard and Moak, *supra*, note 84 at 5, and citing R. Bush, *et al.*,"Remedies for Product Counterfeiters" [1 January 1989] Business Horizons 59. Manufacturers should use legal action to drive up the price of selling counterfeits and thus reduce the competitive advantage gained by selling unapproved parts. *Ibid.*

[338] Maynard and Moak, *supra* note 84 at 5.

[339] Based on M. Crichton, *Airframe* (New York : Ballantine, 1986).

aircraft : a Slats Proximity Sensor (an electronic unit mounted on the wing near the slats, connected to a warning light in the cockpit to show the pilot the status of the slats); a Slats Locking Pin and an Engine Thruster Panel. The aircraft's wing was manufactured by Norton who mounted the unapproved locking pin on the wing, having purchased it from a distributor dealing in fasteners (bolts, screws, rivets etc.) who misrepresented the pin as being an approved standard part. The slats proximity sensor was installed by TPA's own repair installation in Hong Kong. This part was, however, a rebuilt salvaged part which TPA had bought and installed without requiring documentation from the distributor who supplied it. The engines of the aircraft were manufactured by a company called Rolls Whitney. Norton bought the engines as complete units from the engine manufacturer and installed them on the N-22. The unapproved engine thruster panel was however a counterfeit part installed on the starboard engine by a Repair Station in Singapore, contracted by TPA to perform emergency repairs during a scheduled stopover on the way to Vancouver. The during the investigation, the cockpit data recorder of the N-22 indicates that the slats proximity sensor failed in flight, indicating to the first officer, who was flying at the time that the slats were deployed when they shouldn't have been. According to correct procedures, the first officer deployed the slats and then immediately retracted them to confirm whether the sensor system was the problem and not the slats themselves. During this deployment, the substandard locking pin failed, initiating the aircraft's pitch oscillations. At this stage, however, the first officer deviated from correct procedure and tried to fight the autopilot, worsening the oscillations. The investigation determines that the engine thruster panels, even though counterfeit, did not fail or in any way contribute to the incident.

This hypothetical example demonstrates that the possible claims arising from unapproved parts scenario can be classified into two main categories : first, claims where the unapproved part caused an incident or accident; and second, claims where the unapproved part was discovered before it caused any damage. Before considering these two categories separately, several issues common to both categories will be considered.

A. Common Issues

1. Possible Defendants

The first preliminary issue common to both types of unapproved parts claims is that of possible defendants. From the hypothetical example given above, the possible defendants in an unapproved parts scenario can be identified. These are the following :

- **the person who falsely presented an unapproved part as approved** (the part's distributor or supplier[340] or any other person who falsified part documentation);
- **the owner/ operator of the aircraft** (the only separate claim against the owner/operator of the aircraft would be under the Warsaw Convention or on the basis of the pilot's incorrect actions which fall outside the scope of this thesis);
- **the person who installed an unapproved part on an aircraft** (this might be the owner/operator or a separate Repair Station);

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[340] This could also be a part's counterfeiter or the person who illegally rebuilt or overhauled an unapproved part, although they would also be liable on other, separate grounds.

- **the owner of a stolen or salvaged part** (for example, an Original Equipment Manufacturer or Repair Station from whose premises a part was stolen; or an insurer who owns an accident wreckage);
- **a part counterfeiter**;
- **the person who illegally overhauled or rebuilt an unapproved part**;
- **the original manufacturer of a rebuilt or overhauled unapproved part** (ie. a prime manufacturer, Original Equipment Manufacturer, or Parts Manufacturing Approval holder);
- **the prime manufacturer** (ie. the manufacturer of the aircraft or engine on which the unapproved part was installed);
- **government authorities for ineffective oversight**; or
- **the government for lax control over military parts**.

2. Awardable Damages

The second question which is common to both categories of unapproved parts claims is the issue of awardable damages. The damages awardable in civilian aviation suits today, specifically in the US, can reach staggeringly high sums of money. These awards often run into tens of millions of dollars.[341] The mechanics of the calculation of damages are beyond the scope of this thesis.[342]

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[341] Lange and Thomas, *supra* note 200 at 29-33.

[342] It would suffice to say the following : in the US, damages are awardable either in terms of statutorily prescribed civil penalties (such as is the case with trademark protection statutes) or as calculated by the court on its own (and this is where damages such as punitive damages, particularly if there was some form of misrepresentation can sometimes run into very high amounts). This is why, prescribing associated civil penalties along with the explicit criminalization of all acts in relation to unapproved parts is so important in ensuring a measure of certainty and uniformity. See *supra* at 64.

However, a question concerning civil damages relevant to unapproved parts which arises is the issue of so-called 'deep pocket' defendants. As will be seen later, it is possible that in a single claim, several defendants may have been jointly at fault. In such cases, under US law, 'joint and several liability' rules allow a victorious plaintiff to claim all of their awarded damages from any one of the liable defendants without approaching the others. In an unapproved parts scenario, this is an unfavorable situation for defendants who are legitimate industry elements, since the 'dishonest' elements when it comes to unapproved parts are very often small, backyard operations.[343]Suppose therefore that in a particular unapproved parts case, the illegal rebuilder of an unapproved part was determined to be 90% at fault and the Repair Station who installed it only 10% at fault. In this case, according to joint and several liability, the successful plaintiff would be able to claim 100% of his damages from the Repair Station, as the defendant with the 'deeper pocket.'[344] Against this background, it is to be welcomed in the US that several states, such as California, have abrogated traditional joint and several liability rules, so that a defendant will only be liable for the percentage of non-pecuniary damages[345] for which it is actually responsible.[346] The victim is nevertheless still entitled to collect his economic damages (such as lost wages or medical expenses) from any defendant.

3. Effect of US General Aviation Revitalization Act (GARA)

The GARA is a US Act which impacts on both types of unapproved parts claims. This Act is

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[343] See Maynard and Moak, *supra* note 84 at 7.

[344] See Kiesel, *supra* note 91 at 64. "Despite the diligence of manufacturers in instituting suits, counterfeiters often are found to be without assets or in bankruptcy." *Ibid.*

[345] Damages for emotional loss such as the loss of care, comfort and society of a loved-one.

[346] Kolczynski, *supra* note 332.

therefore the third preliminary common issue covered before considering unapproved parts claims in more detail. The GARA is a federal statute of repose in the US which restricts a plaintiff from suing the manufacturer of an allegedly defective part eighteen years after it was manufactured.[347] This limitation only exists against the manufacturer, and in the event that an eighteen year-old unapproved part was to cause an accident,[348] presumably all the other possible defendants in the suit (for example a part overhauler, distributor or installer) could still be sued.

4. Unfair Trade Practices Acts

The final issue to be examined before considering the two types of unapproved parts claims themselves is the question of Unfair Trade Practices Acts. A possibility in the US (probably available in the case of both of the categories of unapproved parts actions discussed in this thesis) is that the defendant could also be liable under an Unfair Trade Practices Act. Where US states have enacted such Acts, violations would include a "systematic method of doing business that is not in accordance with the standards of that particular trade or business."[349] Thus it would be possible to argue that by not operating in accordance with aviation industry quality control and other standards, an industry member dealing with unapproved parts would be liable under one of these Acts.

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[347] See R. Hedrick, "A Close and Critical Analysis of the New General Aviation Revitalization Act" [November/December 1996] Journal of Air Law and Commerce 385.

[348] This is not as unlikely as it may seem. Given the increasing average age of the world's aircraft fleet, the existence of rotable parts and the ease with which an old part can overhauled and accompanied with false documentation, this is in fact a very likely scenario.

[349] Lange and Thomas, *supra* note 201 at 39.

B. Claims Arising from an Accident or Incident Caused by Unapproved Parts

The first heading under which claims resulting from unapproved parts could be grouped is claims arising from an accident or incident caused by such parts. Possible plaintiffs to whom this type of claim would be available would be any person who suffered physical harm as a result of the accident or incident caused by the unapproved part. For example, a passenger who was injured could be the plaintiff or the plaintiff could be the owner/operator whose aircraft was damaged. Under certain causes of action, it would also be possible for a plaintiff who suffered pure economic loss to claim that type of loss successfully. The plaintiff in such a case could be an airline claiming for loss of business caused by decreased consumer confidence in that airline after an accident in which one of its aircraft was lost.[350]

Under this type of unapproved parts claim, probable causes of action and likely defendants under each are the following :

1. Negligence

The defendants against whom a finding of negligence is possible would be the following: (1) the person who presented an unapproved part as approved; (2) the person who installed the part;

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[350] However, an Original Equipment Manufacturer (OEM) or Prime Manufacturer would not have a for loss of business on the grounds that its aircraft or equipment have received a negative image because of a counterfeiter's actions. This is because a claim for pure economic loss requires some form of business transaction between the parties. There is of course no such link between an aircraft manufacturer and a parts counterfeiter. The manufacturer would have a claim for this damage though, if it was connected to the other claims available to the manufacturer against a parts counterfeiter. These are the claims of trademark infringement, conversion or patent infringement. See *infra* at 126 *et seq.*

(3) the owner of stolen parts; (4) a parts counterfeiter; or (5) the part's original manufacturer.

The first element of a claim for negligence which is required is the existence of a duty of care owed by the defendant to the plaintiff.[351] According to one source, "[r]epair stations and airlines are charged with the duty of using reasonable care in placing only airworthy parts into service."[352] This duty is not unique to installers of aircraft parts. Indeed, every element along the chain of parts manufacture and distribution has a duty to ensure that only approved parts reach the eventual installer. Thus, there can be no doubt regarding the existence of a duty on parts owners to guard against them being stolen;[353] and there is even a duty on a part owner to take steps once it has been stolen to prevent it becoming available for installation.[354]

The question of whether the original manufacturer of a rebuilt part is shouldered with such a duty is less straightforward. A parts manufacturer does have a duty not to supply a "defective" product.[355] In this regard, an established type of "defect" is a concept known as a Marketing Defect. This type of defect in a product exists when a manufacturer fails to observe his products after they have been sold and fails to issue warnings to users of those products should some problem become apparent with regard to the products. Usually manufacturers fulfill this duty

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[351] E. Kionka, *Torts in a Nutshell,* 2nd ed. (St. Paul, Minnesota : West Publishing Co., 1992) at 47.

[352] Lange and Thomas, *supra* note 200 at 24. See also Luedemann, *supra* note 4 at 125, regarding the duty of care placed on Repair Stations. In the US, however, in terms of Federal Aviation Regulation (FAR) Part 91.403(a), "[t]he owner or operator of an aircraft is primarily responsible for maintaining that aircraft in an airworthy condition." This would appear to relieve the Repair Station of any duty of care in maintaining an operator's aircraft. However, according to Hedrick this is not the case, since this FAR does not imply that the owner has an exclusive duty. Thus when an aircraft owner retains a Repair Station to inspect his aircraft and make appropriate repairs, the duty of airworthiness may be delegable. *Supra* note 4 at 136, citing *Cosgrove v. Mc Donnell Douglas* 847 F. Supp. 719 (D. Minn. 1994).

[353] Hedrick, *supra* note 4 at 125.

[354] *Ibid,* at note 23, citing the steps taken by American Airlines once parts had been stolen from the wreckage of its Boeing 757 which crashed in Columbia. See *supra* note at 17.

[355] Kionka, *supra* note 351 at 255.

of guarding against marketing defects by issuing Service Bulletins.[356] Therefore the question which arises is : do manufacturers have a duty to issue a Service Bulletin if they become aware of examples of their products which have become unapproved parts? Industry practice would appear to answer in the affirmative. This is illustrated by the example given earlier in this paper, which involved a mechanic at United Airlines discovering counterfeit Pratt and Whitney aircraft engine seal spacers.[357] In this case, Pratt and Whitney did issue a Service Bulletin to all users of the engine in question, warning them to look out for further examples of the counterfeit parts.

However, in the case of military parts approved for use on military aircraft which find their way onto the civilian aviation market, the parts' original manufacturer should not be held liable, since there is a break in the causal chain and the civilian industry is not the intended ultimate user.[358] The second element to be proven in a claim for negligence is that the defendant breached his duty of care by failing to act according to a required standard of conduct.[359] In an unapproved parts sense, this would require two factors to be proven . First, that the relevant part was unapproved and its inferiority caused it to fail;[360] and second, that the defendant did not use reasonable care to detect the unapproved part. The measure by which it is decided whether or not the defendant in a particular case exercised reasonable care or not is the industry standard at the relevant time.[361] As has been argued already, the aviation industry standard for detecting

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[356] See *supra* at 86.
[357] *Supra* note 1.
[358] Hedrick, *supra* note 4 at 122.
[359] *Ibid* at 147.
[360] Hedrick, *supra* note 4 at 122.
[361] *Ibid*, at 133; and Lange and Thomas, *supra* note 200 at 24.

unapproved parts should now be relatively high since all elements in the industry can be considered to be aware of the unapproved parts problem. As an example, the determination of what constituted the industry standard in a particular case could entail an examination of the quality control procedures currently in use in the industry. In this regard advisory material, such as FAA Advisory Circulars,[362] could also be construed as indicative of the industry standard.

Furthermore, the construction of negligence *per se* exists as an aid to proving a breach of a duty of care.[363] According to the *Second Restatement of Torts*[364] in the US, a statute or regulation, if adopted for the protection of a certain class of persons, may provide the standard of care to such persons in negligence actions. The effect of this is that if the statute or regulation is violated, negligence is presumed on the part of the violator and the burden of proof shifts away from the plaintiff.[365] Thus if all possible acts surrounding unapproved parts were to be targeted in aviation regulations, as is proposed in this study, this would have a positive influence also on private law negligence actions such that negligence *per se* would be provided for.

The third element to be proven in a negligence action is that actual loss or damage of a recognized kind must have been suffered by the plaintiff.[366] Generally, only actual physical harm to person or property is required and a claim for pure economic loss would be better served by contractual claims.[367]

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[362] See *supra* note 272.
[363] See Hedrick, *supra* note 4 at 131 for a very detailed discussion of negligence *per se*.
[364] At s. 286.
[365] Hedrick, *supra* note 4 at 131.
[366] Kionka, *supra* note 351 at 48.
[367] *Ibid.*, at 226. See *infra* at 124.

Lastly, a sufficient causal link must exist between the defendant's negligent conduct and the damage caused in order for a claim of negligence to succeed.[368] In the case of unapproved parts, this might not always be easy to prove. As one commentator has noted, "its very hard to pin the cause of an accident on a part that failed...especially when the aircraft is scattered over five acres."[369] Moreover, most aircraft accidents are caused by the combined affect of a series of factors.[370] In the aviation industry, this is called a 'cascade.'

Furthermore, even once an accident has been determined to have had an unapproved part play a role (in other words, there are other claims apart from the unapproved part and the claims it causes), there will also be more than one party who could be sued with regard to the unapproved part. Most likely all the parties along the chain of manufacture, distribution and installation would be defendants. Thus, a problem which arises is traceability. Especially, with falsified documentation, it may not always be possible to trace a part back to the true culprit.

2. Reckless conduct

A second possible cause of action in a case where an unapproved part caused an accident or

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[368] *Ibid.*, at 48.

[369] See *Plane parts on Black Market*, *supra* note 4, citing J. Frisbee. See also Hedrick, *supra* note 4. "...[P]robable cause is an art, a science and a colossal gray in between." *Ibid.*

[370] See L.Reingold, "The Search for Probable Causes" [July 1994] Air Transport World 25. "Most serious accidents are the result of not one event, but a series of events..." *Ibid.* A good example of this phenomenon is provided by the US National Transportation Safety Board's report on the 1992 crash of a Lockheed L-1011, which involved an aborted take-off shortly after lift-off, followed by a fire. The causes identified by the report were (1) design deficiencies in the aircraft's stall warning system; (2) failure by the airline's maintenenance crews to to correct a malfunction in the system; and (3) inadequate flight-crew co-ordination. Cited, *ibid.* See also R. Sumwalt, "The Quest for Aviation's Holy Grail : Finding Underlying Causes of Accidents and Incidents" [December 1995] Interpilot 6; and C. Miller, "Probable Cause : The Correct Legal Test in Civil Aircraft Accident Investigations?" (25 March 1997), http://www.pr.erau.edu/people/case/ library/ reports3/8.html (date accessed : 07 June 1998).

incident is Reckless Conduct. Reckless conduct implies conduct where the actor is (or ought to be) conscious of the risk he is creating by his action (or failure to act). Despite this, he chooses to proceed regardless.[371]

Pure negligence as discussed above (entailing inadvertence, inattention, or incompetence) is more likely to be the cause of action for a claim against the owner of a stolen part or against a part's original manufacturer. Thus, the most likely defendants under a claim for reckless conduct in an unapproved parts case would be a part counterfeiter, documentation forgers or part rebuilders. It would not be difficult to prove that a forger, counterfeiter or illegal overhauler ought to have known of the risk they were creating by their actions.[372] It is also likely that an unapproved part's installer be found liable of reckless conduct, providing that it could be proved that he knew he was installing an unapproved part.

The advantage of reckless conduct over negligence in the US is that punitive damages are available and causation rules are slightly more favorable to the plaintiff.[373]

3. Intentional Misconduct

Intentional misconduct is the third possible cause of action in a case where an unapproved part caused an accident or incident. The requirements for a successful claim of intentional misconduct are : (1) the actor was aware that his actions were certain or substantially certain to bring about

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[371] Kionka, *supra* note 351 at 102.
[372] Hedrick, *supra* note 4 at 124.
[373] Kionka, *supra* note 351 at 103.

the resultant harm; and (2) he *intended* that harm to result.

It would be difficult to prove that the original manufacturer, forger, counterfeiter or parts overhauler of an unapproved part in a specific case indeed were *certain* that damage would result from the part.[374]

Less difficult to prove, however, would be that the person who knowingly installed an unapproved part on an aircraft was liable on the grounds of the intentional misconduct of Trespass to Chattels.[375] "One commits trespass to another's chattels by intentionally interfering with it. Interference may consist of damage, alteration or destruction."[376]

4. Strict Liability

A further possible cause of action resulting from an accident or incident caused by an unapproved part is that of Strict Liability.

Possible defendants under strict liability in an unapproved parts scenario would be the parts distributor, a part counterfeiter and an overhauled part's original manufacturer of an unapproved part. As will be seen below, under certain circumstances, the person who illegally overhauled an unapproved part and the person who installed an unapproved part might also be strictly liable.

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[374] Hedrick differs on this issue in suggesting that a parts counterfeiter could be liable of intentional misconduct. *Supra* note 4 at 124.

[375] Kionka, *supra* note 351 at 149.

[376] *Ibid.*

On the one hand, under strict liability based on Breach Of Implied Warrantability, the seller of an unapproved part to a *bona fide* buyer is strictly liable on the grounds that the product was not fit for the purpose it was bought for. Furthermore, since the requirement of privity of contract no longer exists under this cause of action, the seller is deemed to have made that warranty to (and is therefore strictly liable to) all subsequent users of the product.[377] On the other hand, the second basis of strict liability is Strict Liability Based in Tort. The application of this type of strict liability in an unapproved parts environment is more interesting. The US *Second Restatement of Torts* provides the following with regard to strict liability based in tort:

> (1) One who sells any product in a defective condition unreasonably dangerous to the user or consumer or to his property is subject to liability for physical harm thereby caused to the ultimate user or consumer, or to his property, if
> (a) The *seller* is engaged in the business of selling such a product, and
> (b) It is expected to and does reach the user or customer without *substantial change in the condition in which it was sold.*[378]

In applying the above Restatement, the concept of "one who sells any product" has been widened to include the manufacturer, seller or distributor who places a defective product into the stream of commerce.[379] Thus, if a part is shown to be unapproved, if its inferiority caused it to fail and if there is a causal nexus between this inferiority and the plaintiff's damage, then the distributor of an unapproved part is strictly liable. The same can be said of the Repair Station who installed the part, or any other party along the chain of distribution of an unapproved part - provided they *sold* the part.[380]

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[377] *Ibid* at 220.
[378] At s. 402A [emphasis added].
[379] Burt, *supra* note 4 at 871.
[380] Hedrick, *supra* note 4 at 131.

However, the situation is not as clear in the case of an unapproved part overhauler. One writer has stated the following :"[u]sed-product merchants who rebuild or recondition their merchandise, even when they do not misrepresent their goods, have been held subject to strict liability,"[381] if they *substantially change* the product in the process[382] (and are therefore considered the part's manufacturer). However, several points come to mind regarding this statement.

First, if the part overhauler is a merchant and engaged in the business of selling parts, he would be liable as "one who sells a product" and there is no need to to examine the part for substantial change to determine his liability as an overhauler.

Second, the application of this substantial change doctrine in the case of unapproved parts is unique. The *Restatement of Torts* requires "substantial change from the condition *in which it was sold.*"[383] Presumably this means from when it was first sold after manufacture. Thus this would mean that the overhauler of an unapproved parts is actually *reducing* the change in the part's condition from when it was first sold. Regardless of whether it just involves a new coat of paint or more detailed repairs, the overhauler is not introducing substantial change, but lessening it.

Thus, in the sphere of aircraft parts, there is actually not much scope for application of the substantial change doctrine. This is because an aircraft part is different from, for example, an automobile. An automobile overhauler might lengthen the vehicle's wheelbase, change its

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[381] Burt, *supra* note 4 at 871, citing *Barrett v. Superior Ct.*, 272 Cal. Rptr. 304,312 (Cal. Ct. App. 1990).
[382] *Ibid.*
[383] *Supra* note 378 at s. 402A(1)(b) [emphasis added].

engine, change the bodywork from a sedan to a pick-up and change the color and someone would still want to buy it. An aviation part on the other hand, because it is a specified very specifically in the aircraft's Design Standards, will not be bought if its condition differs substantially from its original condition.

Therefore, according to the wording of section 402A(1)b) of the *Restatement of Torts*, it would appear that an aircraft parts overhauler is not strictly liable unless he also *sold* the part.

The following question which can be raised is whether the original manufacturer of an unapproved part is liable under Strict Liability. It is the position of this paper that in the case of stolen surplus parts which cause damage, the manufacturer of those parts should indeed be held strictly liable.

However, the situation is more complicated where a manufacturer's parts have been subsequently overhauled by some other party. Whether these parts' original manufacturer would be strictly liable for damage caused subsequently by these parts would depend firstly on the degree to which they had been repaired. In other words, it would depend on the extent to which substantial change in the parts had been introduced or not, rendering the overhauler liable as if he were the parts' manufacturer. However, according to the US case of *Sapp v. Beechcraft Corp,*[384] when a defect in a part causes damage, the defect in this part must have existed at the time it left its original manufacturer's hands before liability will attach to that manufacturer. This would be the case with overhauled defective *reject* parts. However, it is doubtful whether the parts' original

[384] 564 S. 2d. 418 (Ala. Sup. Ct. 1990).

manufacturer would be strictly liable in the case of overhauled *salvaged* parts, where the defect entered the part after it left the original manufacturer's hands. Nevertheless, in the case of overhauled accident damaged parts, there is a break in the causal link to the original manufacturer.

5. Misrepresentation

The fifth possible cause of action likely to result from an accident caused by an unapproved part is a claim for misrepresentation. Generally, the tort action of misrepresentation is limited to cases involving a business or financial transaction between two parties in which one of them has sustained some sort of pecuniary loss.[385] Therefore, with respect to unapproved parts, the plaintiff under a claim of misrepresentation is the person who received unapproved parts (either through a purchase agreement or through the repair of his aircraft). The defendant in an unapproved parts misrepresentation claim would be the person who supplied the unapproved parts or the service through which they were installed on an aircraft.

The first element to be proved in a misrepresentation action is that there must have been a false representation of a fact - the presentation of an unapproved part as approved. This representation can be by words or conduct. Earlier in this study less reliance on physical parts documentation was proposed. Therefore, misrepresenting a part's status as approved should not rest solely on forged documents. Any other form of representation of the part as approved (for example by means of the packaging of the part) or even the mere act of a Repair Station installing a part on

[385] Kionka, *supra* note 351 at 405.

an aircraft (which act implies that the part is airworthy), should be sufficient here.

The second element to be proved for a successful claim of misrepresentation is that the defendant must have known that his representation was false or that he made the representation in conscious ignorance of whether it was true or false. Thus in an unapproved parts scenario, this could include a distributor who sold a part without having first checked it to ensure it was not an unapproved part.

Furthermore, the third element required to be proved under a claim for misrepresentation is that the defendant intended to induce reliance on his representation on the part of the plaintiff.

However, as a fourth requirement, the plaintiff's reliance on the representation of the defendant must have been justifiable. A question which can be raised here is : what is the effect of the heightened awareness in the aviation industry of unapproved parts on this requirement? For example, could a parts purchaser claim to have relied on the false representation of an unapproved part as approved even though he had a quality control system in place to verify the nature of all the parts he bought? The answer is that:

> ... the mere fact that [the plaintiff] made an independent investigation...does not...defeat recovery or establish that he did not rely on the defendant's false statement, since such investigation or facts themselves may not have been conclusive...,[unless] something known to him or apparent in the situation at hand should have served as a warning to him that the [defendant's] statement ought not to be accepted without further enquiry.[386]

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[386] *Ibid* at 424.

6. Breach of Contract

In an accident caused by an unapproved part, it is also possible that a claim for breach of contract may result. In an unapproved parts claim for breach of contract, the plaintiffs and defendants correspond to the possible parties in a claim for misrepresentation. Under a claim for breach of contract, there are two possible variations in an unapproved parts scenario.

The first possibility is an action on the grounds that the defendant breached either an express or implied warranty of the contract under which the unapproved parts were purchased. An example of this possibility would be the case of a Repair Station installing unapproved parts which would constitute a breach of a repair warranty.[387]

Second, a contract in which unapproved parts were involved may be contestable on the grounds of Bad Faith.[388] The *United States Commercial Code* states that good faith "...in the case of a merchant means honesty in fact and observance of reasonable commercial standards of fair dealing in the trade."[389] The requirement is that good faith be observed in contract formation, performance, execution and enforcement.[390] Clearly, the actions of a parts distributor or repair installation in supplying unsafe unapproved parts would not constitute an observance of this requirement.

Under a variation of the good faith requirement, if the plaintiff can prove that the defendant did

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[387] See Hedrick, *supra* note 4 at 131.
[388] Lange and Thomas, *supra* note 201 at 38.
[389] U.C.C. s. 2 - 103(1)(b).
[390] *Ibid.*

not adhere to "industry standards," the contract is also voidable.[391] Therefore, the plaintiff could also succeed in a claim for breach of contract if he was able to prove that the defendant did not have a suitable quality control process in place to detect unapproved parts.

7. Government Liability

A final possible basis of claim resulting from an accident caused by an unapproved part would be an action for damages against the government. There are two possible scenarios under this heading.

First, with regard to military parts : the question which arises is whether an action is possible against the government for lax control and ineffective disposal of single-use or substandard military parts (which find their way onto the civilian market and cause damage).[392] The government has a duty, analogous to the duty of civilian members of the aviation industry, to take precautions to prevent theft and misuse of government and military equipment. An action against the government might therefore be possible in the case of military parts. The problem however is that the causal link might be very difficult to prove here.

The second possible scenario raises the following question : whether or not, in any civilian accident whatsoever, (irrespective of whether it involved military parts or not), the government aviation regulatory body can be held liable for the failure of its safety oversight system to detect

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[391] C. Rohwer and G. Schaber, *Contracts in a Nutshell*, 4th ed. (St. Paul, Minnesota : West Publishing Co., 1997) at 187.

[392] See Hedrick *supra* note 4 at 123.

and eliminate the unapproved parts in the accident. In the US, the answer to this is that it is unlikely that such a claim will succeed, since the US Government's regulation of aviation is likely to be covered by the exclusions of the *Federal Tort Claims Act.*[393]

C. Claims Where the Unapproved Part Has Not Caused an Accident or Incident

The second main category into which claims caused by unapproved parts can be grouped are those claims where no accident or incident has been caused by these parts. These are claims where the unapproved parts have merely been discovered in a parts stock or even installed on an aircraft. These claims can be grouped into two further categories : (1) claims where the plaintiff is the original manufacturer of an unapproved parts; and (2) claims where the plaintiff is a person who has purchased unapproved parts or received them through aircraft repairs .

1. Where the Plaintiff Is the Original Manufacturer of Counterfeited Products

The first category of possible claims in a scenario where an unapproved part has been detected before causing an accident are those in which the plaintiff is the part's original manufacturer.

The first possible claim available to the original manufacturer in the case of a counterfeited unapproved part is Trademark Infringement. In the US, the common law principles of trademark protection are codified in the *Lanham Act.*[394] A trademark is defined as a mark, device, symbol or a combination which a person uses to distinguish his goods from those manufactured by

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[393] *Ibid.* See 28 U.S.C. at s. 1346.
[394] 15 U.S.C. s. 1051-1127.

others.[395] In terms of aircraft parts, a trademark might include inspection stamps, PMA symbols, the five number federal source identifiers many aircraft firms apply to their products, parts numbers, etc.[396] Thus, where a counterfeiter has affixed some sort of mark onto the counterfeited product which falsely presents it as being of a certain origin, he is liable for civil penalties in terms of the *Lanham Act*.[397]

Furthermore, under the terms of the *Lanham Act* it is also possible that the counterfeiter be liable for unfair competition in the form of Passing Off. Passing off is defined as the act of passing one's product off as that of another in an attempt to take advantage of the competitor's goodwill and reputation.[398] Therefore, a counterfeiter may still be liable under the *Lanham Act* even though he may not actually have affixed any identifying mark onto his product. This would be the case if a counterfeiter had presented the product by some other means as being manufactured by a particular manufacturer

A second possible basis of claim available to a parts manufacturer against a part counterfeiter is Patent Infringement. This is a further possible remedy where the counterfeiter has not affixed an identifying mark to his product. Thus, this claim might be available even though a counterfeiter has not presented his product as being from a particular manufacturer. In terms of the action for Patent Infringement, "[a]nyone who, without permission, makes, uses or sells a patented invention is a direct infringer of the patent."[399] The "...critical test in any infringement

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[395] *Ibid* at s. 1127.

[396] Luedemann, *supra* note 4 at 144; and Leggett, *supra* note 60 at 56.

[397] S. 1114(1); Burt *supra* note 4.

[398] A. Miller and M. Davis, *Intellectual Property. Patents, Trademarks and Copyright in a Nutshell*, 2nd ed. (St. Paul, Minnesota : West Publishing Co., 1990) at 151-2.

[399] *Ibid* at 129.

suit is whether the infringing device performs substantially the same overall function or work, in substantially the same way, to obtain substantially the same overall result"[400] Given the specific design and purposes of aircraft parts this should not be difficult to prove. The advantage of this claim is that "good faith or ignorance is no defence for direct infringement."[401] The only restricting factor here is that only patented parts (implying parts for which a patent has been registered at the patent office) are covered and only the patent holder has a claim. Thus, a manufacturer with a Parts Manufacturing Approval (PMA) might have a claim in terms of trademark infringement, but he will not necessarily have a claim under patent infringement. A third and last possible claim for a manufacturer whose parts have been counterfeited is under the tort of Conversion.[402] This tort rests "... on depriving another of his property permanently or for an indefinite period of time or *the intentional exercise of dominion or control over a chattel which is inconsistent with another's...rights in it.*"[403] For the purposes of conversion, a chattel can include intangible property. Therefore, the advantage of a claim of conversion is that no registered patent is required and it presumably would also be available to manufacturers with some or other right in a particular aircraft part. An example of such a right would be a Parts Manufacturing Approval (PMA). However, the disadvantage of this cause of action is that specific intent is required of the defendant.

8. Where the the plaintiff is a person who has purchased unapproved parts or received them through aircraft repairs

The second category of possible claims in a scenario where an unapproved part has been detected

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[400] *Ibid* at 124.
[401] *Ibid* at 131.
[402] Maynard and Moak *supra* note 84 at 5.
[403] *Supra* note 351 at 151 [emphasis added].

before causing an accident are those in which the plaintiff is the person who has purchased the unapproved part or received it through aircraft repairs. The likely plaintiffs and defendants under this scenario are the same as those under the actions for misrepresentation and breach of contract discussed above.

The only additional question to be answered here is whether the claims of misrepresentation and breach of contract are equally available when the plaintiff has suffered no physical loss in terms of injury or damage to his aircraft, since the unapproved part has been discovered before it led to an accident. In these cases, the plaintiff will have suffered pure economic loss. For example loss caused by time spent on the ground by the plaintiff's aircraft while the part was being repaired.

Indeed, the answer to this question is in the affirmative and pure economic loss can in fact be recovered under a claim by the plaintiff who has purchased an unapproved part or received it through aircraft repairs. Under an action for breach of contract, the plaintiff is entitled to "expectation damages"[404] and in the case of misrepresentation, the *Second Restatement of Torts* provides the following :

> ...[o]ne who, in a sale, rental, or exchange transaction with another, makes a representation of a material of a material fact for the purpose of inducing the other to act or refrain from acting in reliance upon it, is subject to liability to the other for pecuniary loss caused to him by his justifiable reliance upon the misrepresentation.[405]

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[404] Rohwer and Schaber, *supra* note 391 at 254.
[405] At s. 552C.

CHAPTER 6

SUMMARY OF CONCLUSIONS

The objective of this thesis has been to propose a complete international and national legal regime to combat the problem of unapproved parts. Thus, throughout this thesis several conclusions and proposals have been made. It is heuristic to summarize these conclusions and proposals as follows.

I. BOGUS PARTS OR UNAPPROVED PARTS?

First of all, this thesis proposes that the term 'bogus parts' be abandoned and that the more legally acceptable term 'unapproved parts' be used. Furthermore, there is the issue of whether the concept of unapproved parts should include not only sub-standard parts but also parts which might not necessarily be sub-standard, but have become separated from their documentation. This means that these parts' status as airworthy or sub-standard cannot be determined. It is herein that the danger of these parts lies. Accordingly, this thesis argues that these parts should be included under an anti-unapproved parts regime.

II. TYPES OF UNAPPROVED PARTS AND REASONS TO ADDRESS THE PROBLEM

Two broad types of unapproved parts can therefore be identified : first, sub-standard parts; and second, parts with documentary irregularities. Within these two categories, no less than ten sources of unapproved parts can be identified : counterfeit parts; undocumented parts; stolen

parts; salvaged parts; surplus and reject parts; military parts; rebuilt/overhauled parts; standard parts; misused approved parts; and falsely documented parts. A detailed consideration of these parts and their effects on the aviation industry revealed that there are three reasons for addressing this phenomenon by means of legal measures : first, unapproved parts do constitute a danger to aviation safety; second, they have a negative economic effect on the industry; and third they are eroding the current system of aviation regulation.

III. ELEMENTS OF AN EFFECTIVE ANTI-UNAPPROVED PARTS LEGAL REGIME

The legal regime regulating unapproved parts can be divided into two levels. First, unapproved parts can be addressed at the international level, where international law should prescribe to states the elements to be included in their national anti-unapproved parts regimes. This thesis identifies these elements as the following: (1) a legal definition of unapproved parts must be outlined; (2) all activities in the chain of unapproved parts manufacture, distribution and installation should be targeted to eradicate the problem; (3) effective prevention mechanisms should be implemented to prevent escalation of the problem; and (4) an effective regime to deal with the negative effects of these parts on the relations among individuals should exist. Moreover, the international regime addressing unapproved parts can be divided into an international aviation regime, an international anti-counterfeiting regime and an international private law regime.

IV. INTERNATIONAL LEGAL REGIME

It is the conclusion of this thesis that the current international aviation regulatory regime (the Chicago Convention and its related materials) does not sufficiently address the issue of unapproved parts. While the ideal of a new binding international aviation law instrument to remedy this state of affairs is emphasized, the quickest and most practical option proposed is the publication of an ICAO Technical Manual on the subject of unapproved parts.

V. NATIONAL PUBLIC LAW REGIME

At the national level, the legal regime addressing unapproved parts is also at two levels, namely at a public law level and at a private law level.

At the public national law level, the issue of unapproved parts can be addressed not only by the country's aviation regulatory regime but also through the broader criminal law regime. This study proposes that a state's aviation regulatory regime address the following four issues in combating unapproved parts: (1) a precise, all-encompassing legal definition of unapproved parts must be developed; (2) all possible activities in the chain of unapproved parts distribution and use must be prohibited; (3) effective means to enforce these prohibitions must be provided; and (4) effective pro-active prevention mechanisms to contain the problem must be established.

In terms of a legal definition of unapproved parts, this paper proposes separate definitions of 'approved' and 'unapproved' parts. Thus, an 'unapproved part' can be defined as a part not conforming to the requirements of an approved part and *which could not reasonably be identified as such*. This definition opens the way for more effective documentary identification

of approved parts (since current parts documentation is in some cases too cumbersome and too easily forged). This definition also allows for the substitution of general intent or negligence as the required form of fault in unapproved parts cases.

The chain of manufacture, distribution and use of unapproved parts was examined in this thesis. The following activities were identified as targets of prohibition by national regulation: (1) producing or selling unapproved parts; (2) falsely presenting an unapproved part as approved or misrepresenting an approved part; (3) installing unapproved parts; or (4) failing to dispose of scrap parts or report unapproved parts. After an analysis of the current United States and Canadian regulatory regimes dealing with these four issues this study concluded that, while issues (2) and (4) were addressed to some extent, the others were not satisfactorily covered. Several regulatory changes were therefore proposed.

In support of the prohibitions proposed above, it is to be emphasized that effective supporting measures are required. These include more effective policing mechanisms, such as an improvement on the current system of inspections. Also, effective penalties are essential in deterring dishonest industry elements from becoming involved in the trade in unapproved parts.

The last subject to be addressed by the national aviation regulatory regime is the implementation of effective prevention mechanisms to contain the problem of unapproved parts. The first question which can be raised here is whether parts distributors should be regulated or not. This thesis concludes that there is nothing to gain from the regulation and licencing of aircraft parts distributors except increased bureaucracy and costs. Thus, the preferred solution is to adopt the

system which is currently being tested in the United States, which involves the voluntary accreditation of parts distributors by independent third party quality control organizations. Other prevention mechanisms which must be addressed by the national aviation regulatory regime are the prescription of quality control procedures by aviation industry elements; the effective response by authorities to unapproved parts reports and discoveries; the targeting of military ; and the initiation of a process of re-certifying undocumented parts must be launched.

Within the national public law regime, general criminal law can also be used in the fight against unapproved parts. The following criminal acts have been highlighted in this paper in an unapproved parts context : trademark infringement; fraud; murder or manslaughter; criminal damage to property; and contravention of customs statutes. It can be concluded, however, that criminal law should remain only a supplementary anti-unapproved parts tool. However, the fact that many of the possible acts in an unapproved parts scenario are covered by existing criminal acts is not an argument against addressing the problem in a specific aviation regulatory regime. This is because most of the existing criminal acts require fault in the form of specific intent on the part of the offender, while this thesis argues that negligence should be sufficient in an unapproved parts context. Also, many of the procedural rules and penalties in terms of existing criminal acts are not acceptable for the purposes of unapproved parts.

VI. NATIONAL PRIVATE LAW REGIME

Lastly, a country's national private law is a further tool to combat unapproved parts. This area of law can be harnessed to compensate those private individuals who have been injured by the

existence of unapproved parts. Two broad types of claims are identified in this study : first, there are claims arising from an accident or incident caused by unapproved parts. Second, there are claims where an unapproved part has not caused an accident or incident. Under the first possibility, the following claims are possible : negligence; reckless conduct; intentional misconduct; strict liability; misrepresentation; breach of contract; and government liability. An important conclusion which was reached in this regard is that the application of strict liability in an unapproved parts scenario was extremely limited. Under the second possibility, possible claims can be grouped under two further headings : (1) where the plaintiff is the original manufacturer of counterfeited products; and (2) where the plaintiff is a person who has purchased unapproved parts or received them through aircraft repairs. The chief claims here are trademark infringement, patent infringement and possibly the tort of conversion.

Therefore, as a final summary, currently the national criminal law and private law regimes are effective in combating unapproved parts. However, these should exist to complement an explicit national anti-unapproved parts aviation regulatory regime at the national level; and it must be emphasized, then, that currently national and international aviation regulation require attention in more effectively addressing the problem of unapproved parts.

APPENDIX 1

AIR CANADA AIRCRAFT PARTS REQUIRED DOCUMENTATION MATRIX

PART SUPPLIER	PART CONDITION	STANDARD HARDWARE	COMMERCIAL HARDWARE	LIFE LIMITED (NOTE 1)	TIME CONTROLLED (NOTE 2)	ROTABLES (NOTE 2)	EXPENDABLES
1. TC Holder/ Licensee STC, TSOA, PMA	New/Factory	A	A	A or B	A or B	A or B	A or B
2. Air Carrier 121, 129, 135 Repair Station (Note 3 & 4)	New/Unused	A	A	A or B	A or B	A or B	A or B
	Repaired			B	B	B	B
	Overhauled			B	B	B	B
	Repairable			D	D	D	D
3. Supplier Broker/ Distributor (Note 3, 4 & 5)	New/Unused	A	A	A or B	A or B	A or B	A or B
	Repaired			B	B	B	B
	Overhauled			B	B	B	B
	Repairable			D	D	D	D
4. OEM * Subcontractor	New	A	A	C	C	C	C

* i.e. A manufacturer for Boeing that does not have PMA for that part.

Purpose: To identify documents the seller must provide when selling the above listed parts. Air Canada reserves the right to reject unsatisfactory parts and documentation required by this specification.

A. "Part Traceability and Material Certification Form on Letter Head", from the Approved Licensed Manufacturer' or Air Carrier for aircraft parts. Standard & Commercial hardware manufaturers are not required to have a license or approval. Hardware may be obtained from Air Carrier only if traceability to the manufacturers is available.

B. Transport Canada Form 24-0078, FAA Form 8130-3, JAA Form 1 or, accept for factory new parts, Serviceable Tag with Maintenance Release.

C. For direct shipment, written authorization from the Production Approval Holder (PAH) is required and must be provided with each shipment in addition to the certificate of conformance from the supplier. (ie. TSOA, PMA, STC, etc.)

D. FAR 121/129/135 Air Carrier or Foreign Carrier removal tag or FAR 145 repairable tag with traceability to carrier.

Note 1: The seller must supply documentation indicating the history from birth of the part. Serviced parts must have a maintenance release from an Air Canada Approved Repair Station.

Note 2: The seller must supply documents indicating hours, cycles, and/or days since the last overhaul and the record or work accomplished. Serviced parts must have a maintenance release from an Air Canada Approved Repair Station.

Note 3: The parts must be traceable to a FAR 121, 129 or 135 Air Carrier, Foreign Carrier or Approved Licensed Manufacturer. Serviced parts must have a maintenance release from an Air Canada Approved Repair Station.

Note 4: New, unused, surplus parts my be procured from these vendors. These vendors are not authorized to manufacture and provide new parts unless certificated under Part 21.2. Hardware with traceability to the manufacturer.

Note 5: Certificate of Conformance Statement or ATA Form 106 must accompy all shipments.

APPENDIX 2

SUMMARY : Possible Plaintiffs, Defendants and Causes of Action Matrix - Private Law Claims in an Unapproved Parts Scenario

		POSSIBLE PLAINTIFFS			
		Accident/ Incident Victim (ie. person who suffered damage from failure of part)	**Recipient of Unapproved Part/Service (for physical and pure seconomic loss)**	**Original Manufacturer**	**Prime manufacturer for pure economic loss ?**
POSSIBLE DEFENDANTS	**ALL UNAPPROVED PARTS** **- Person who presented part as approved** **- Owner/operator of aircraft** **- Person who installed the part** **- Government for faulty oversight ?**	- Negligence/reckless conduct; Strict Liability - Possibly Warsaw Convention - Negligence/reckless conduct; Strict Liability; Trespass to Chattels - No Claim	- Misrepresentation; Breach of Contract (bad faith) - Misrepresentation; Breach of Contract (bad faith)	- Trademark infringement; Conversion; Patent infringement	- Yes but only if connected to other claim of trademark infringement; conversion; patent infringement
	STOLEN PARTS **- Original owner of part**	- Negligence			
	COUNTERFEIT PARTS **- Counterfeiter**	- Negligence/reckless conduct - Strict Liability		- Trademark infringement; Conversion; Patent infringement	- Yes but only if connected to other claim of trademark infringement; conversion; patent infringement
	REBUILT/OVERHAULED PARTS **- Original manufacturer ?** **- Repairer/Overhauler**	- Negligence; Strict Liability - Negligence/reckless conduct; Strict Liability			
	MILITARY PARTS **- Government for lax disposal ?**	- No Claim	- No Claim	- No Claim	- No Claim

NOTES :

- "Person who presented part as approved" means (but is not limited to) a Parts Distributor.
- Defendants may be liable under more than one appellation (for example the owner/operator might also be the person who installed the part, counterfeiter or rebuilder might be the person who misrepresented the par
- Some defendants could also have claims against other defendants (for example the owner operator might have a claim against the installer of the part)
- The Prime Manufacturer could possibly be liable if it fell under one the defendants already listed above
- ct liability of original manufacturer of rebuilt/overhauled parts very limited and highly dependant on causal links

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18 U.S.C. s. 2 (Aiding , Abetting or Willfully Causing an Offence to Be Committed Against

the US)

18 U.S.C. s. 32 (Endangering the Safety of Aircraft in Flight)

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