

Notes on the Flight Phase Taxonomy

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Introduction

This paper provides background information and additional explanations for the Flight Phase taxonomy, located at <http://semantics.aero/flight-phase>. (A human-readable representation may be seen at <http://semantics.aero/pages/flight-phase.html>.)

Sources

The Flight Phase taxonomy was derived from two primary sources:

1. **ICAO Phase of Flight Definition and Usage Notes (1.3)**, Commercial Aviation Safety Team/International Civil Aviation Organization (CAST/ICAO) Common Taxonomy Team (CICTT), April 2013, located at <http://www.intlaviationstandards.org/Documents/PhaseofFlightDefinitions.pdf>
2. **IATA Safety Report 2014**, International Air Transport Association, issued April 2015, located at <http://asndata.aviation-safety.net/industry-reports/IATA-safety-report-2014.pdf> (see Annex 1 Phase of Flight Definitions, pp. 101-102)

Each of these sources is discussed below.

ICAO Phases of Flight

The ICAO taxonomy is one of a number of taxonomies developed by CICTT with the intention of improving the aviation community's capacity to focus on common safety issues. According to ICAO, the taxonomy focuses on powered fixed-wing land and rotorcraft operations, and its definitions are written to cover manned as well as unmanned aircraft. In the taxonomy, a phase of flight is a period within a flight, where a flight is defined this way: *"In the case of a manned aircraft, a flight begins when any person boards the aircraft with the intention of flight and continues until such time as all such persons have disembarked. In the case of an unmanned aircraft, a flight begins at the time the aircraft is ready to move with the purpose of flight and continues until such time it comes to rest at the end of the flight and the primary propulsion system is shut down."*

The ICAO taxonomy is made up of the following:

Primary phases: Standing (STD), Taxi (TXI), Takeoff (TOF), Initial climb (ICL), En Route (ENR), Maneuvering (MNV), Approach (APR), Landing (LDG)

Secondary phases: Emergency Descent (EMG), Uncontrolled Descent (UND), Post-Impact (PIM), Pushback/Towing (PBT), Unknown (UNK)

Each primary and secondary phase has a number of sub-phases that are not shown here. These primary and secondary phases also form the basis of the ADREP Flight Phase taxonomy, which is used by ICAO to categorize the operational phase during which an aircraft accident and incident happened and to allow safety trend analysis on occurrences by this category. The ADREP Flight Phase taxonomy is part of the ICAO Accident Data Reporting System (ADREP).

IATA Phases of Flight

The IATA taxonomy is another phase of flight taxonomy that focuses on safety management. Although the names of many IATA phases are nearly identical to the ICAO phase names, IATA phases are delineated more by the activities performed by flight crew and ground personnel during each phase, and

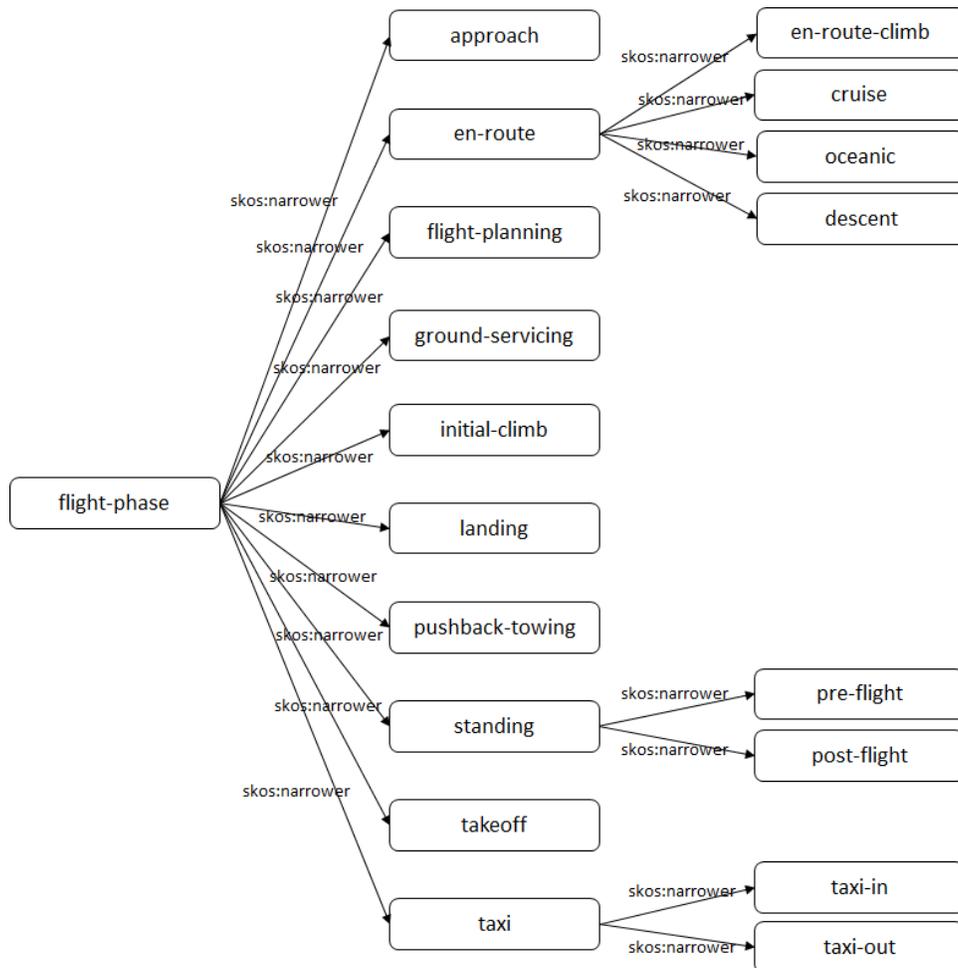
as a result their definitions are quite different. In addition, while ICAO defines a flight as beginning when anyone boards the aircraft with the intention of flight and ending when everyone has disembarked, IATA includes flight planning and ground servicing phases since these phases can directly impact a flight.

The IATA taxonomy consists of the following phases:

Flight Planning (FLP)	Pre-flight (PRF)	Engine Start/Depart (ESD)
Taxi-out (TXO)	Takeoff (TOF)	Rejected Takeoff (RTO)
Initial Climb (ICL)	En Route Climb (ECL)	Cruise (CRZ)
Descent (DST)	Approach (APR)	Go-around (GOA)
Landing (LND)	Taxi-in (TXI)	Arrival/Engine Shutdown (AES)
Post-flight (PSF)	Flight Close (FLC)	Ground Servicing (GDS)

Structure of the Flight Phase Taxonomy

By comparing the ICAO and IATA phases and definitions, the following Flight Phase taxonomy was defined and rendered in OWL ontology language and RDF:



The concepts shown in the diagram are listed below, along with the sources from which their definitions are derived or modified:

Flight Phase Taxonomy Concepts	Source
Flight Phase	ICAO
Flight planning	IATA
Standing (<i>a.k.a.</i> parked)	ICAO
Pre-flight	IATA
Post-flight	IATA
Pushback/towing	ICAO
Taxi	ICAO
Taxi-out	IATA
Taxi-in	IATA
Takeoff (<i>a.k.a.</i> departure)	ICAO
Initial climb	ICAO
En route	ICAO
En route climb	IATA
Cruise	ICAO
Oceanic	FAA
Descent	IATA
Approach	ICAO
Landing (<i>a.k.a.</i> arrival)	ICAO
Ground servicing	IATA

Most of the original source definitions were modified slightly to make them consistent in form (e.g., they all begin “This phase occurs...”) and shortened to remove explanatory notes.