

# FVBATCH INTEGRATION GUIDE



## Table of Contents

1.	<i>Introduction</i>	3
2.	<i>OAG Servers</i>	3
3.	<i>Method Requests</i>	3
3.1	GetLatestFlights	4
3.2	GetFlightChanges	4
3.3	GetFlightChangesSinceTimestamp	4
4.	<i>Best Practices for Differences Output Integration</i>	4
5.	<i>Method Response</i>	5
6.	<i>Flights Included in Output per Flight Window</i>	6
7.	<i>Output Contents</i>	7
7.1	Batch Output Fields	7
7.2	Differences Output Fields	9
8.	<i>Using FVBatch for Flight Notifications</i>	11
8.1	Flight Status Descriptions & Recommended Display Text	11
8.1	Data Values That Should Not Trigger Alerts	12
8.2	Alerting on Flight Diversions	13

## 1. Introduction

OAG's FVBatch Data feed enables customers to integrate OAG's robust, real-time flight information with their products and systems – some of which include travel management solutions, flight notification systems, airport operations systems, and ground transportation reservation and dispatch systems. This content enhances such products and systems to drive improved customer service, increased customer loyalty, greater sales, and better operational efficiencies.

The FVBatch Data feed includes flight schedule data, real-time radar-based air traffic data from the FAA, and current flight status information published by airlines and airports on an ongoing basis. Currently, this flight data covers commercial flights worldwide.

FVBatch includes two types of outputs that are made available via web services every X minutes where X is configurable. Often customers choose X as 1, 3, or 5 minutes but it is not restricted to these values. The first type of output is a Batch output which contains full flight records for flights scheduled to fly today within a given time window. The second type of output is a Differences output which consists of full flight records for (1) flights scheduled to fly today that have experienced a change in flight information since a previous Batch output, and (2) flights scheduled to fly today that have just entered the target time window.

The full records in both outputs include a spectrum of valuable flight information. There is standard information concerning departure and arrival airports and times (scheduled, estimated, actual), as well as code share information, delay and cancellation status, diversion and recovery details, gate assignments, and baggage assignments.

## 2. OAG Servers

The OAG Servers support the FVBatch data feed via an FVBatch web service. Customers shall submit web service calls to request Batch or Differences outputs and OAG shall provide responses that include the requested outputs in compressed format.

The Servers are in a secure co-location facility with 24/7 support and 99% plus uptime. They are load-balanced to ensure fast responses to customer queries.

## 3. Method Requests

There are three web service methods that the customer may use to request the desired Batch and/or Differences outputs. The method requests will be made via SSL to ensure they are secure. The web service is available here: [data.OAG.com/BatchService.asmx](https://data.OAG.com/BatchService.asmx)

These methods include:

- BatchResponse GetLatestFlights(username, password)
- BatchResponse GetFlightChanges(username, password, previousBatchId)

- BatchResponse GetFlightChangesSinceTimestamp(username, password, timestamp)

Each method shall be described in the following subsections.

### 3.1 GetLatestFlights

The *GetLatestFlights* method will return the latest Batch output in tab-delimited format.

BatchResponse GetLatestFlights(username, password)

The *username* and *password* parameters will be passed in clear-text since the calls will be made via SSL. The fields and format of the Batch output are specified in Section 7.

### 3.2 GetFlightChanges

The *GetFlightChanges* method calculates the differences between the latest Batch output and a previous one.

BatchResponse GetFlightChanges(username, password, previousBatchId)

The *username* and *password* parameters will be passed in clear-text since the calls will be made via SSL. The *previousBatchId* parameter specifies which previous Batch output to compare against the latest one to determine differences. The customer must remember the Batch ID returned from its last method call to *GetFlightChanges* or *GetLatestFlights* and submit it here as the *previousBatchID*. The fields and format of the differences output are specified in Section 7.

### 3.3 GetFlightChangesSinceTimestamp

The *GetFlightChangesSinceTimestamp* method calculates the differences between the latest Batch output and the oldest Batch output that is newer than the specified timestamp.

BatchResponse GetFlightChangesSinceTimestamp(username, password, timestamp)

The *username* and *password* parameters will be passed in clear-text since the calls will be made via SSL. The *timestamp* parameter is the current time when the method is submitted by the customer. The fields and format of the Differences output are specified in Section 7.

## 4. Best Practices for Differences Output Integration

To ensure that a customer's integration with FVBatch for pulling Differences outputs is smooth, OAG recommends some best practices.

1. It is recommended that the customer persist the previously retrieved Batch Id on the client side such that if the client process or machine is restarted, the Batch Id will still be available.

2. If a customer is unable to pull target Differences outputs or consume them per its standard client processes for a period of time, the customer may need to “catch up” when these processes are restored. To do so, the customer can pass the Batch Id from the last successful web services call to the *GetFlightChanges* method. All flight changes will be rolled up into one new Differences output for the customer to process.
3. If the previously retrieved Batch Id becomes unavailable to the client, the client can call *GetFlightChangesSinceTimeStamp* and pass in a timestamp that ensures flight changes which occurred during the downtime that are still relevant to users now, will trigger alerts now. Depending on how long the client was down, some flight changes may have occurred so long ago that they are not useful to users now. Therefore, the customer should decide how long ago a flight change could occur that is still relevant to users now and base the timestamp on this timeframe.

For example, a customer may decide that only flight changes which occurred in the past 4 hours are still relevant to users now. Therefore, if the client server goes down for more than 4 hours, the timestamp passed into the *GetFlightChangesSinceTimeStamp* method will always be (current time – 4 hrs). As a result, if the client server is down for 6 hours, then alerts will never be generated for flight changes that occurred between 4 hrs ago and 6 hrs ago.

NOTE: It will be very difficult to guarantee that there will be no missed or duplicate alerts unless the customer remembers the previous Batch Id and passes it in the *GetFlightChanges* method.

## 5. Method Response

The OAG Servers will return a response which includes a number of values along with the requested data output. These values include:

**Response status:** The Response status will give an indication as to whether the request was processed correctly or failed. There are two possible values: OK, Failed.

**Response code:** If the request fails, then a Response code shall be included in the response and it shall provide a reason for the failure. The table below shows a mapping between the Response code and the Response message.

**Response message:** If the request fails, then a Response message that corresponds to the Response code shall be provided as the reason for the failure. The following table shows a mapping between the Response code and the Response message.

Code	Message
1	Invalid batchId
2	Invalid username or password
3	Invalid timestamp
4	Batch no longer exists
5	No newer Batch output exists
6	Technical difficulties. Please call OAG support.

**Batch Id:** The Batch Id will be a unique identifier for the latest Batch output used in the response. If the customer requested a Batch output, then this unique identifier will be for the Batch output itself. If the customer requested a Differences output, then this unique identifier will be for the latest Batch output used to generate the Differences output. If the customer is

using the *GetFlightChanges* method then the customer must save the BatchId as an input to the next *GetFlightChanges* call.

**Batch creation time:** The Batch creation time is the UTC time when the latest Batch output used in the response was created. Again, if the customer requested a Batch output, then this is the time the latest requested Batch output was created. If the customer requested a Differences output, then this the time when the latest Batch output used to generate the Differences output was created.

**Is Compressed:** The Is Compressed is a flag that indicates whether the data output is compressed or not.

**Uncompressed Data Size:** The Uncompressed Data Size is the number of bytes associated with the data when it is not compressed. This is used to determine the buffer size when decompressing the data.

**Data Output:** In addition to the above values, the requested data output shall be included in the response. The Batch and Differences output, both tab-delimited, will be UTF-8 encoded to a byte array, gzip compressed, and then Base64 encoded. See Section 7 for the specific fields and formats of these outputs.

## 6. Flights Included in Output per Flight Window

The Batch output and the Differences output will contain a set of “flight legs” where a flight leg involves an airplane taking off from one airport and flying directly to another without landing anywhere in between. Airlines often schedule a given aircraft to fly multiple flight legs in a given day and therefore they assign the same flight number to all these legs. The only different between the legs is the combination of their origin airport + destination airport + scheduled departure time.

The set of flight legs that are included in the Batch and Differences outputs are those with flight times within a time window defined as: [current\_time - X, current\_time + Y]. The value Y is called the “look-head” time. More specifically, this set includes:

- Any flight leg whose scheduled departure time has past or is in the next Y hours and has not reached a terminal flight status
- Any flight leg whose terminal flight status occurred within the last X hours.

Terminal flight statuses include: Cancelled, Landed, and InGate.

For example, if the current time is 10:00am and the flight window is [-2 hrs, +24 hrs], then flight legs whose scheduled departure time was in the past but has not reached a termination status or whose scheduled departure time is before 10:00am tomorrow will be included in the output. Also, flights legs whose terminal flight status occurred between 8:00am and 10:00am today will be included in the output.

The flight window may be specified by the customer but shall be implemented by OAG. It will be the same for both the Batch outputs and Difference outputs received by a given customer. The default window is [-2 hrs, +24 hrs].

**Flights in Batch Output:** The flight legs included in the Batch output are straightforward; all flight legs that are currently in the flight window, as defined above, shall be in it.

**Flights in Differences Output:** The flight legs included in the Differences output fall into 2 categories:

- All flight legs that were not in the flight window in the previous Batch output\* but are in the latest Batch output, shall be in it, regardless whether any of their values have changed.
- All flight legs that were in the flight window in the previous Batch output\* and are in the latest Batch output and have had at least 1 value change between the latest Batch output and the previous Batch output shall be in it.

\*The previous Batch output is the one based on input from the customer in methods, *GetFlightChanges* (per *previousBatchId*) and *GetFlightChangesSinceTimestamp* (per *timestamp*).

## 7. Output Contents

Both the Batch output and the Differences output shall have full records for those flight legs in the output. A full record includes values for a set of flight information fields. In addition, the Differences output shall have values for additional \*differences\* fields. All of these fields shall be specified in the following subsections.

These outputs shall be retained on the OAG servers for at least the duration of the “look-ahead” portion (see Section 6) of the time window.

### 7.1 Batch Output Fields

The Batch output will be tab-delimited and contain the fields in the table below for each flight leg described in Section 6. This list of fields is subject to change, so customers should build their integration based on the field names (columns) instead of the field position in the output.

Note that lines starting with # will be treated as comments and ignored. Also, the first line that is not empty and not a comment will be the column header line.

	Field Name (Column)	Description
1	FlightId	Unique identifier for the flight leg
2	ProcessingTimeUtc	Time when the Batch output was created (UTC format)
3	AirlineCode	The 2-character IATA airline code
4	FlightNumber	The flight number assigned by the airline
5	SchedDepAirportCode	The 3 letter IATA airport code for the departure airport
6	SchedArrAirportCode	The 3 letter IATA airport code for the arrival airport
7	SchedDepartureUtc	The scheduled departure date & time assigned by the airline (UTC format)
8	SchedArrivalUtc	The scheduled arrival date & time assigned by the airline (UTC format)
9	SchedDepartureLocal	The scheduled departure date & time assigned by the airline (in time zone local to the departure airport)
10	SchedArrivalLocal	The scheduled arrival date & time assigned by the airline (in time zone local to the arrival airport)
11	Status	Current status or “state” of the flight leg; possible values include: Unknown, Scheduled, NoTakeoffInfo, Proposed, Cancelled, Delayed, OutGate, InAir, Landed, InGate, Expected, PastFlight
12	DiversionStatus	Current status or “state” relative to scheduled arrival airport for the flight leg; possible values include: <blank> (flight leg is on target for scheduled arrival airport), Diverted (flight leg diverted to alternate arrival airport instead of scheduled arrival airport), Recovery (flight leg for recovery from alternate airport to scheduled arrival airport)
13	RecoveryExists	For a diverted flight leg, indicates whether a recovery flight leg has been established; possible values are: Y, N
14	OpAirlineCode	The 2-character IATA airline code for the airline that is operating the flight

15	OpFlightNumber	The flight number associated with the operating flight assigned by the operating airline
16	AltDepAirportCode	If DiversionStatus = Recovery, this is the alternate airport code the recovery leg departed from
17	AltArrAirportCode	If DiversionStatus = Diverted, this is the alternate airport code the flight has been diverted to
18	OutGateLocal	Date and time aircraft departed gate in local time
19	OutGateUTC	Date and time aircraft departed gate in UTC time
20	OutGateAccuracy	Flag indicating whether the reported time is based on the schedule, estimated by the airline or OAG's algorithm, or an Actual time; possible values are: Scheduled, Estimated, Actual
21	OutGateSource	The source of the OutGate time; possible values are: ScheduleData, AirlineData, OAGData
22	InAirLocal	Date and time aircraft left the runway in local time
23	InAirUTC	Date and time aircraft left the runway in UTC time
24	InAirAccuracy	Flag indicating whether the reported time is based on the schedule, estimated by the airline or OAG's algorithm, or an Actual time; possible values are: Scheduled, Estimated, Actual
25	InAirSource	The source of the InAir time; possible values are: ScheduleData, AirlineData, OAGData, FAA
26	LandedLocal	Date and time aircraft landed in local time
27	LandedUTC	Date and time aircraft landed in UTC time
28	LandedAccuracy	Flag indicating whether the reported time is based on the schedule, estimated by the airline or OAG's algorithm, or an Actual time; possible values are: Scheduled, Estimated, Actual
29	LandedSource	The source of the Landed time; possible values are: ScheduleData, AirlineData, OAGData, FAA
30	InGateLocal	Date and time aircraft arrived at the gate in local time
31	InGateUTC	Date and time aircraft arrived at the gate in UTC time
32	InGateAccuracy	Flag indicating whether the reported time is based on the schedule, estimated by the airline or OAG's algorithm, or an Actual time; possible values are: Scheduled, Estimated, Actual
33	InGateSource	The source of the InGate time; possible values are: ScheduleData, AirlineData, OAGData
34	DepTerminal	Terminal assignment for the flight leg at the departure airport
35	DepGate	Gate assignment for the flight leg at the departure airport
36	Check-in Counter	Check-in counter (if available)
37	ArrTerminal	Terminal assignment for the flight leg at the arrival airport
38	ArrGate	Gate assignment for the flight leg at the arrival airport
39	Baggage	Baggage claim assignment for the flight leg at the arrival airport
40	SvcType	The type of service provided by the flight leg, whether it is for passengers only, cargo only, mail only, passengers & cargo, cargo & mail; common values include: J (scheduled, normal service passenger), S (scheduled, shuttle mode passenger) – check with OAG for more values
41	AircraftType	The type of aircraft that is flying the flight leg
42	OptionalEquipment	A classification of the AircraftType; possible values are: H (heavy), M (medium), L (light)
43	WeightClass	The weight class of the aircraft that is flying the flight leg
44	Unscheduled	Indicates that the flight was not in the schedule; possible values are: Y, <blank>
45	SeqNum	Many flight numbers have multiple legs and the sequence number indicates the order in which this Flight leg appear among all the legs; values are integral starting at 1
46	NumLegs	Total number of legs of this flight number
47	DepAirportCountryId	Country Id for the departure airport
48	ArrAirportCountryId	Country Id for the arrival airport
49	TailNumber	Registration number of aircraft operating flight (ex: N935UW)
50	RegAirlineCode	The 2-character IATA airline code of regional airline operating flight
51	RegFlightNumber	The flight number as assigned by the regional airline
52	DepScheduleStatus	Current status or "state" of the flight leg relative to its scheduled departure time; possible values include: Blank (No schedule status



		available), DD (Departure Delay), DO (Departure OnTime), DE (Departure Early)
53	ArrScheduleStatus	Current status or "state" of the flight leg relative to its scheduled arrival time; possible values include: Blank (No schedule status available), AD (Arrival Delay), AO (Arrival OnTime), AE (Arrival Early)
54	OriginationDateLocal	Origination date of multi-leg flight number originated in local time of departure airport
55	OriginationDateUTC	Date when multi-leg flight number originated in UTC format
56	[DomIntDep]	[for future use]
57	[DomIntArr]	[for future use]
58	PrevFltAirlineCode	2-letter IATA code of the airline which operated this aircraft's previous flight
59	PrevFltNumber	The number of the flight previously operated by this aircraft
60	PrevFltSchedArrLocal	The scheduled arrival date & time of the previous flight of this aircraft in local time
61	PrevFltSchedArrUTC	The scheduled arrival date & time of the previous flight of this aircraft in UTC format
62	PrevFltMethod	The method by which previous flight was determined: A=airline provided information; T=determined by linking aircraft registration number
63	Suffix	Used by airlines to differentiate flights with identical flight number and routing in same UTC day; possible value=Z
64	AircraftOwner	2-Letter IATA code of airline to which aircraft is registered
65	IsGeneralAviation	Flag (Y) identifies flight leg as General Aviation flight
66	SchedDepAptNS	Identifies departure airport code type as IATA, FAA or ICAO
67	SchedArrAptNS	Identifies arrival airport code type as IATA, FAA or ICAO
68	AltDepAptNS	Identifies alternate departure airport code type as IATA, FAA or ICAO
69	AltArrAptNS	Identifies alternate arrival airport code type as IATA, FAA or ICAO
70	DepDelayCode	Code provided by airline to describe reason for departure delay
71	ArrDelayCode	Code provided by airline to describe reason for arrival delay
72	UpStreamLegs	Origination airport of flight leg previous to this flight
73	DownStreamLegs	Destination airport of flight leg following this flight

## 7.2 Differences Output Fields

The Differences output shall be tab-delimited and contain the fields in the latest Batch output (Section 7.1) *and* the additional fields in the table below. For each monitored field in the Batch output, there are two additional fields in the Differences output:

1. The "Change" field is a flag that indicates when a change to this field has occurred. Possible values are: Y, <blank> where Y means there is a change and <blank> means there is no change.
2. The "Previous" field is the value for this field in the previous Batch output, where the "previous Batch output" is defined in Section 6.

The flight legs that were in the previous Batch output and have experienced a changed field shall show at least 1 "Change" field populated with a "Y" and the associated "Previous" field populated with some value. The flight legs where are new to the flight window shall only show the *NewToFlightWindow* field with a "Y" and nothing else populated in the "Changed" or "Previous" fields.

Again, the list of additional fields in this output is subject to change, so customers should build their integration based on the field names (columns) instead of the field position in the output.

Note that lines starting with # will be treated as comments and ignored. Also, the first line that is not empty and not a comment will be the column header line.

	<b>Field Name (Column)</b>	<b>Description</b>
74	NewToFlightWindow	Flag that indicates the flight leg is new to the Flight Window. It should have no "Change" fields populated.
75	StatusChange	Flag that indicates there is a change in the Status value in the latest Batch output from that in the previous Batch output; possible values: Y, <blank>
76	PreviousStatus	Value of Status field in previous Batch output
77	DiversionStatusChange	Flag that indicates there is a change in the Diversion Status value in the latest Batch output from that in the previous Batch output; possible values: Y, <blank>
78	PreviousDiversionStatus	Value of Diversion Status field in the previous Batch output
79	OutGateUtcChange	Flag that indicates there is a change in the OutGate date & time (UTC format) value in the latest Batch output from that in the previous Batch output; possible values: Y, <blank>
80	PreviousOutGateUtc	Value of OutGate date & time (UTC format) field in the previous Batch output
81	PreviousOutGateLocal	Value of OutGate date & time (Local airport time) field in the previous Batch output
82	InAirUtcChange	Flag that indicates there is a change in the InAir date & time (UTC format) value in the latest Batch output from that in the previous Batch output; possible values: Y, <blank>
83	PreviousInAirUtc	Value of InAir date & time (UTC format) field in the previous Batch output
84	PreviousInAirLocal	Value of InAir date & time (Local airport time) field in the previous Batch output
85	LandingUtcChange	Flag that indicates there is a change in the Landing date & time (UTC format) value in the latest Batch output from that in the previous Batch output; possible values: Y, <blank>
86	PreviousLandingUtc	Value of Landing date & time (UTC format) field in the previous Batch output
87	PreviousLandingLocal	Value of Landing date & time (Local airport time) field in the previous Batch output
88	InGateUtcChange	Flag that indicates there is a change in the InGate date & time (UTC format) value in the latest Batch output from that in the previous Batch output; possible values: Y, <blank>
89	PreviousInGateUtc	Value of InGate date & time (UTC format) field in the previous Batch output
90	PreviousInGateLocal	Value of InGate date & time (Local airport time) field in the previous Batch output
91	DepGateChange	Flag that indicates there is a change in the Departure Gate value in the latest Batch output from that in the previous Batch output; possible values: Y, <blank>
92	PreviousDepGate	Value of Departure Gate field in the previous Batch output
93	DepTerminalChange	Flag that indicates there is a change in the Departure Terminal value in the latest Batch output from that in the previous Batch output; possible values: Y, <blank>
94	PreviousDepTerminal	Value of Departure Terminal field in the previous Batch output
95	ArrGateChange	Flag that indicates there is a change in the Arrival Gate value in the latest Batch output from that in the previous Batch output; possible values: Y, <blank>
96	PreviousArrGate	Value of Arrival Gate field in the previous Batch output
97	ArrTerminalChange	Flag that indicates there is a change in the Arrival Terminal value in the latest Batch output from that in the previous Batch output; possible values: Y, <blank>

98	PreviousArrTerminal	Value of Arrival Terminal field in the previous Batch output
99	BaggageChange	Flag that indicates there is a change in the Baggage claim value in the latest Batch output from that in the previous Batch output; possible values: Y, <blank>
100	PreviousBaggage	Value of Baggage Claim field in the previous Batch output
101	AircraftTypeChange	Flag that indicates there is a change in the Aircraft Type value in the latest Batch output from that in the previous Batch output; possible values: Y, <blank>
102	PreviousAircraftType	Value of Aircraft Type field in the previous Batch output
103	TailNumberChange	Flag that indicates there is a change in the Tail Number value in the latest Batch output from that in the previous Batch output; possible values: Y, <blank>
104	PreviousTailNumber	Value of Tail Number field in the previous Batch output
105	PrevFltChange	Flag that indicates there is a change in the Previous Flight Airline Code and Flight number values in the latest Batch output from that in the previous Batch output; possible values: Y, <blank>
106	PreviousPrevFltAirlineCode	Value of Prev Flt Airline Code field in the previous Batch output
107	PreviousPrevFltNumber	Value of Prev Flt Number field in the previous Batch output
108	OtherChange	Flag that indicates there is some other field that has changed in the latest Batch output from that in the previous Batch output; possible values: Y, <blank>

## 8. Using FVBatch for Flight Notifications

Some common ways to use FV Batch is for displaying flight status information on consumer-facing applications and for pushing flight notifications on flight changes to end users who are traveling or know someone who is traveling. To help interpret the status values in FV Batch for consumer-friendly UIs and ensure alerts are sent appropriately, OAG makes some recommendations concerning display text and sending (vs. not sending alerts) on specific data values in the Batch and Differences outputs.

### 8.1 Flight Status Descriptions & Recommended Display Text

The following table shows the recommended, consumer-friendly, display text for Flight Status to show in your customer-facing application(s). These values are mapped to the status values in the FV Batch data API. Also a description of each status is provided.

<b>FVXML Data Feed Flight Status Value</b>	<b>Recommended Display Text for Flight Status</b>	<b>Description</b>
Scheduled	Scheduled	The flight exists in airline schedule data. OAG has not received updated information on it from the FAA, airline or departure/arrival airport.
Proposed	Scheduled	This status is relevant to flights tracked by the FAA. It indicates that the pilot has filed a flight plan with the FAA prior to takeoff. This status is explicitly stated in the FVXML feed, however, often it is not relevant to the general public.

OutGate	Departed	OAG has received data indicating that the Flight has left the departure gate, but has not taken off in the air.
InAir	In Air	OAG has received a wheels up message from the FAA, airline, or departure/arrival airport for this flight, indicating it is in the air (for FAA tracked flights, takeoff notification is delayed 5 minutes in accordance with FAA regulations).
Landed	Landed	OAG has received touchdown information from the FAA, airline, or departure/arrival airport for this flight, indicating it has landed.
InGate	Arrived	OAG has received data indicating that the flight has arrived at the arrival gate.
Expected	Expected	OAG has received information from a data source that the flight is expected to land at the arrival airport soon. Often the source is the arrival airport, but not necessarily. In most cases there is an estimated arrival time.
NoTakeOffInfo	No Takeoff Info – Call Airline	It is approximately 30 minutes past the scheduled time of departure for this flight and there is no updated information on it. There is a possibility that updated information will become available, so the flight's status should continue to be monitored. Under these circumstances it is recommended that the airline is called to inquire about the flight's status.
Delayed	Delayed	OAG has received data indicating that the flight has been delayed.
Cancelled	Cancelled	The flight has been cancelled or it is more than 14 hours past the scheduled time of departure and there is no information concerning it.
PastFlight	Past Flight	The operational time window for the flight has passed and OAG did not receive data concerning its actual landing or arrival.
Unknown	No Recent Info – Call Airline	It is more than 90 minutes past the scheduled time of departure for this flight and there is no updated information on it. There is a possibility that update information will become available, so the flight's status should continue to be monitored. Under these circumstances it is recommended that the airline is called to inquire about the flight's status.

## 8.1 Data Values That Should Not Trigger Alerts

There are some data values and changed values that should not trigger an alert being sent to end users because the resulting alert will not be useful to these users, and in some cases may be confusing. The following is a list of values and changes that OAG recommends not triggering alerts.

### **All fields**

1. Do not alert on a change to any field from a populated value to no value. In some cases this may be a result of a temporary missing value in an airline or airport feed to OAG. In the next Batch or Differences output often the value will appear again. If alerts are generated in this case, they will confuse the end users.

### **Status**

1. Do not alert on a Status value change to either of the following values:

Unknown

NoTakeoffInfo

OAG provides these status values when the current time is later than a flight's scheduled departure time and there has not been an update on the flight in the airline or airport data feeds. As a result, there will be no updated information to provide to the end users in an alert.

### **Departure & Arrival Times**

1. Do not alert on a change in Estimated Arrival Time (ETA) if its change from the previous value was within a configurable threshold of minutes. Alerting a user that the ETA has changed by 1 minute will often annoy him/her, particularly if the user receives multiple alerts, each one indicating the ETA has changed by 1 minute. The threshold can be determined by the customer; OAG recommends that it be between 5 - 10 minutes.

2. Do not alert on a Departure Time change after the flight has been assigned a terminal status; terminal statuses include: Landed, InGate, Cancelled.

### **Terminal, Gate, & Baggage**

1. Do not alert on either of the combined changes for Terminal and Gate values:

Terminal = populated & Gate = blank → Terminal = blank & Gate = populated

Terminal = blank & Gate = populated → Terminal = populated & Gate = blank

In some cases this yo-yo behavior occurs in the airline and airport feeds received by OAG and if alerts are generated, they will confuse the end users.

2. Do not alert on Departure Terminal or Departure Gate change after the flight has departed. Once the flight has departed, its status shall be one of the following: OutGate, InAir, Landed, InGate.

3. Do not alert on any Terminal or Gate change after the flight has been assigned a terminal status; terminal statuses include: Landed, InGate, Cancelled.

4. In some airports there are gate numbers that end in a letter; for example, 12A, 12B, 12C and 12D or 77 and 77A. In many cases these gate doors are very close to one another and in the case of the 12-series example above, they may even be different jetways associated with the same gate door. This is common for gates associated with small commuter planes. For such gates, many airline operators often switch the gate/jetway prior to the commuter flights' departures so a flight's gate assignment may change from 12A to 12C to 12B in a short period of time. Since these gates are so close to one another and in many cases are simply different jetways associated with the same gate door, it may not be desirable to alert users numerous times about these changes.

5. In some large, busy airports the gate management system routinely reassigns gates for flights later in the day to accommodate flights currently delayed or facing some other unexpected issue. As a result, it may not be desirable to alert users on gate assignment changes that occur some number of hours prior to a flight's scheduled departure, such as 3 or 4 hours.

## **8.2 Alerting on Flight Diversions**

One of the most valuable flight status changes to alert end users on is a flight diversion. Flight diversions do not occur often, but when they do occur there is significant delay in the travelers reaching their final destination. Therefore, it is important to generate alerts on the diversion and if possible, on the recovery when it occurs.

When a flight is diverted to another airport and a recovery leg is added to fly from the alternate airport to the original destination airport, the flight will be represented in the Batch output as two rows. Essentially, the recovery flight leg shall be added as a new row immediately below the original flight which was diverted. Both flights shall have the same FlightId. The original flight which was diverted will have a DiversionStatus of "Diverted". The second flight, once it is picked up by the FAA data feed, will have a DiversionStatus of "Recovery".

In the Differences output, once a recovery flight leg exists, both flights will show when there is a change to either flight leg. If a recovery flight leg never exists (which occurs sometimes), then the original flight that was diverted will appear in the Differences output when there is a change to one of the flight information field values.

There are two common approaches to alert on diverted flights which are outlined below.

1. Only alert on the diverted flight based on changes in the Differences output for the original flight. If the customer chooses to do this, it is recommended that the alert message suggest that the end user call the airline to inquire about a possible recovery flight leg.
2. Alert on the diverted flight initially and then alert on the recovery flight leg when it is added to the Batch output or Differences output. This is the recommended approach for a stateless alerting system.