

# ***Instrument Pilot***

## CFR Part 91 Instrument Flight Rules

### **Fuel Requirements (CFR 91.167)**

45min fuel reserve

### **Alternate Airport (CFR 91.169)**

An alternate is needed if the weather 1hr before and 1hr after estimated time of arrival if

1. Ceiling will be at 2000ft AGL and
2. Visibility will be at least 3SM

Alternate airport weather minimums

1. Precision App: 600ft AGL and 2SM visibility
2. Non-Precision App: 800ft AGL and 2SM visibility
3. No Approach: Ceiling and visibility minimums are those allowing descent from the MEA, approach and landing under basic VFR

### **VOR equipment check (CFR 91.171)**

VOR check every 30days

1. VOT: 182 TO with error +/-4deg
2. Dual VOR with error +/-4deg
3. Single VOR over VOR check point with error +/-6deg
4. Must be logged with Date, Person, Type of test, Error

### **ATC Clearance and Flight Plan Required (CFR 91.173)**

No person may operate an aircraft in controlled (anything but G) under IFR unless that person has:

1. Filed and IFR flight plan and
2. Received an appropriate ATC clearance

Takeoff and Landing under IFR (CFR 91.175)

1. Use Standard Instrument Approach Procedure
2. Can only go below MDA/DA/DH if
  - a. The aircraft is continuously in a position from which a descent to a landing can be made at a normal rate of descent.

- b. The flight visibility is not less than the visibility prescribed in the Approach procedure
- c. At least one of the following visual references is visible.
  - i. Approach light system allows you to descend to 100ft above Touchdown Zone Elevation.
  - ii. Red side row bars or red terminating bars
  - iii. The threshold or threshold markings or threshold lights
  - iv. REIL (Runway End Identifier Lights)
  - v. The VASI
  - vi. The touchdown Zone, Zone Markings or Zone lights
  - vii. The runway, runway markings, or runway lights.

### **Takeoff minimums**

There are no part 91 takeoff minimums

### **Limitation on Procedure Turns**

No pilot may make a procedure turn unless cleared to do so by ATC if the following exists:

1. Radar Vectors are given to final approach course or fix
2. A times approach from a holding fix or
3. And approach for which the procedure specifies “No PT”

### **ILS Components**

The following may be substituted for an outer marker

1. Compass locator
2. Precision Approach Radar (PAR) or Airport Surveillance Radar (ASR)
3. DME, VOR or NDB
4. RNAV fix

### **Minimum Altitudes for IFR Ops (CFR 91.177)**

1. MEA and MOCA down to MOCA or if not present
2. Mountainous: 2000ft AGL above highest obstacle within 4NM
3. Non-Mountainous: 1000ft AGL above highest obstacle within 4NM
4. Climb:
  - a. Climb to a higher min IFR altitude shall start immediately after passing the point beyond the that min altitude.
  - b. Unless MCA then must cross at MCA (Minimum Crossing Altitude)

### **IFR Cruising Altitudes (CFR 91.179)**

1. Controlled airspace: Per ATC
2. Un-Controlled airspace:
  - a. Mag Course 0-179deg: Odd thousand ft levels
  - b. Mag Course 180-359deg: Even thousand ft levels

## **RVSM Ops (CFR 91.180)**

1. Aircraft and operator must be approved.
2. RVSM is the reduction of 2000 to 1000ft separation requirements between FL210 and FL410

## **Course to be Flown (CFR 91.181)**

No person may operate an aircraft within controlled airspace (only G is uncontrolled) under IFR except as

1. On an ATS route along the centerline of the airway
2. On any other route, along the direct course between nav aids or fixes defining the route.

## **IFR Communications (CFR 91.183)**

Must continuously monitor. Must report the following asap

1. Time and altitude of each designated reporting points or the points assigned by ATC if not in radar surveillance
2. Un-forecasted weather conditions
3. Anything related to safety of flight

## **NORAD - two way radio failure: (CFR 91.185)**

1. VFR conditions: Continue the flight under VFR and land as soon as practicable
2. IFR conditions: Continue the flight according to the following
  - a. Route:
    - i. By the route last assigned by ATC
    - ii. If vectored, by the direct route to the fix, route or airway specified in the vector clearance
    - iii. No assigned route? Then be the route expected
    - iv. If no assigned or expected, then by the flight plan filed.
  - b. Altitude (highest of the following)
    - i. Altitude last received
    - ii. The Minimum IFR altitude (MEA, MOCA, etc.)
    - iii. The altitude ATC has advised to be expected
  - c. When can we leave the clearance limit (the end of the clearance received)
    - i. If fix is on an approach: The expect further clearance limit or if not received, then the time of arrival.
    - ii. If the clearance limit isn't on an approach, leave the clearance limit at expect further clearance time or if not received, then time of arrival.

## **Malfunction Reports (CFR 91.187)**

1. Nav, approach or communication equipment
2. Include N#, Equipment affected, how it affects your IFR ops (impairment)
3. Nature and extend of assistance needed from ATC.