AERONAUTICAL CHARTING MEETING
Instrument Procedures Group
Meeting 21-02 – October 25-26, 2021

RECOMMENDATION DOCUMENT

FAA Control # 21-02-359

Subject: CNF used in airways

Background/Discussion: The PCG states the following regarding CNF:

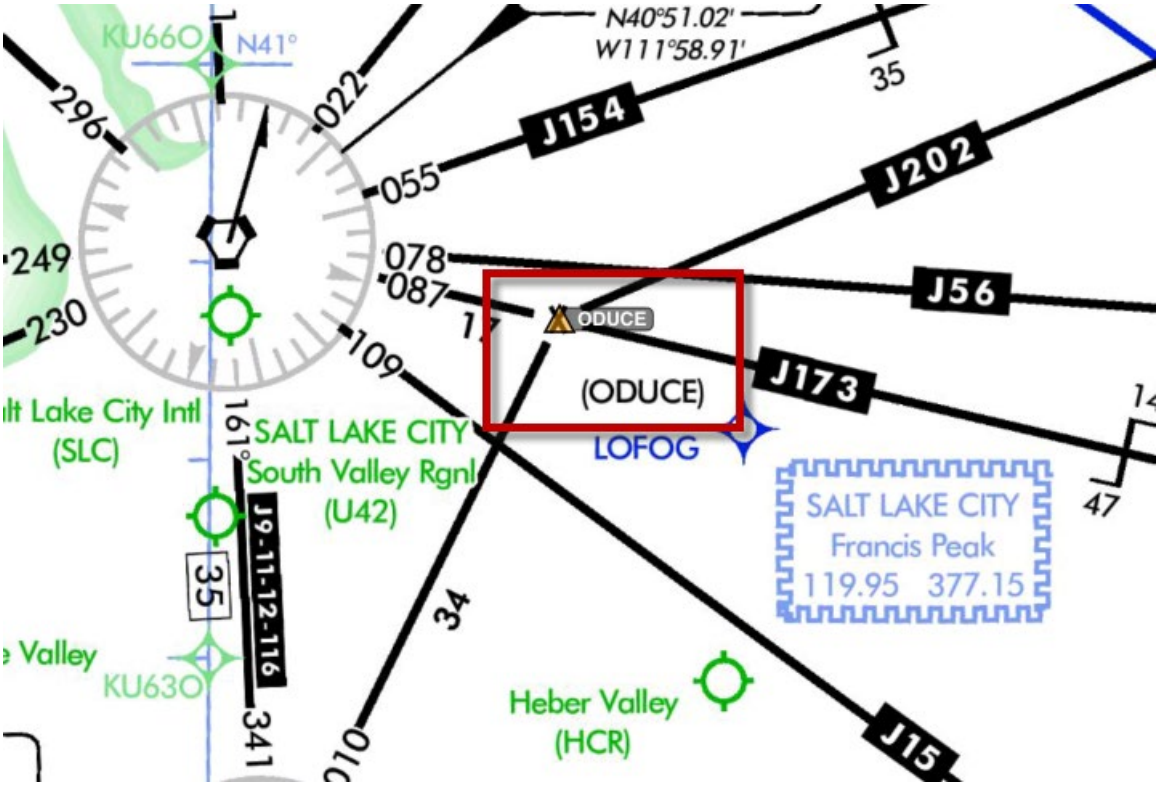
> COMPUTER NAVIGATION FIX (CNF)− A Computer Navigation Fix is a point defined by latitude/longitude coordinate and is required to support Performance−Based Navigation (PBN) operations. A five−letter identifier denoting a CNF can be found next to an "x" on en route charts and on some approach charts. Eventually, all CNFs will be labeled and begin with the letters "CF" followed by three consonants (e.g., 'CFWBG'). CNFs are not recognized by ATC, **are not contained in ATC fix or automation databases**, and are not used for ATC purposes. Pilots should not use CNFs for point−to− point navigation (e.g., proceed direct), **filing a flight plan**, or in aircraft/ATC communications. Use of CNFs has not been adopted or recognized by the International Civil Aviation Organization (ICAO).
> (REFER to AIM 1−1−17b5(i)(2), Global Positioning System (GPS).

CNF have been adapted into airways under the following common situations: at junctions between airways where they intersect; at dog legs in conventional routes; and at airways that transit the US/Canada border. Recently we received a pilot report from a pilot on an international flight plan from Europe through Canada airspace to a US destination. Montreal Center advised the pilot that the CNF in the Q route at the border and included in the aircraft FMS route detail description was causing issues with ADS-C, as it was not adapted by NavCanada. The filed route did not specify the CNF, but when the Q route was expanded in the FMS, it exposed the CNF.

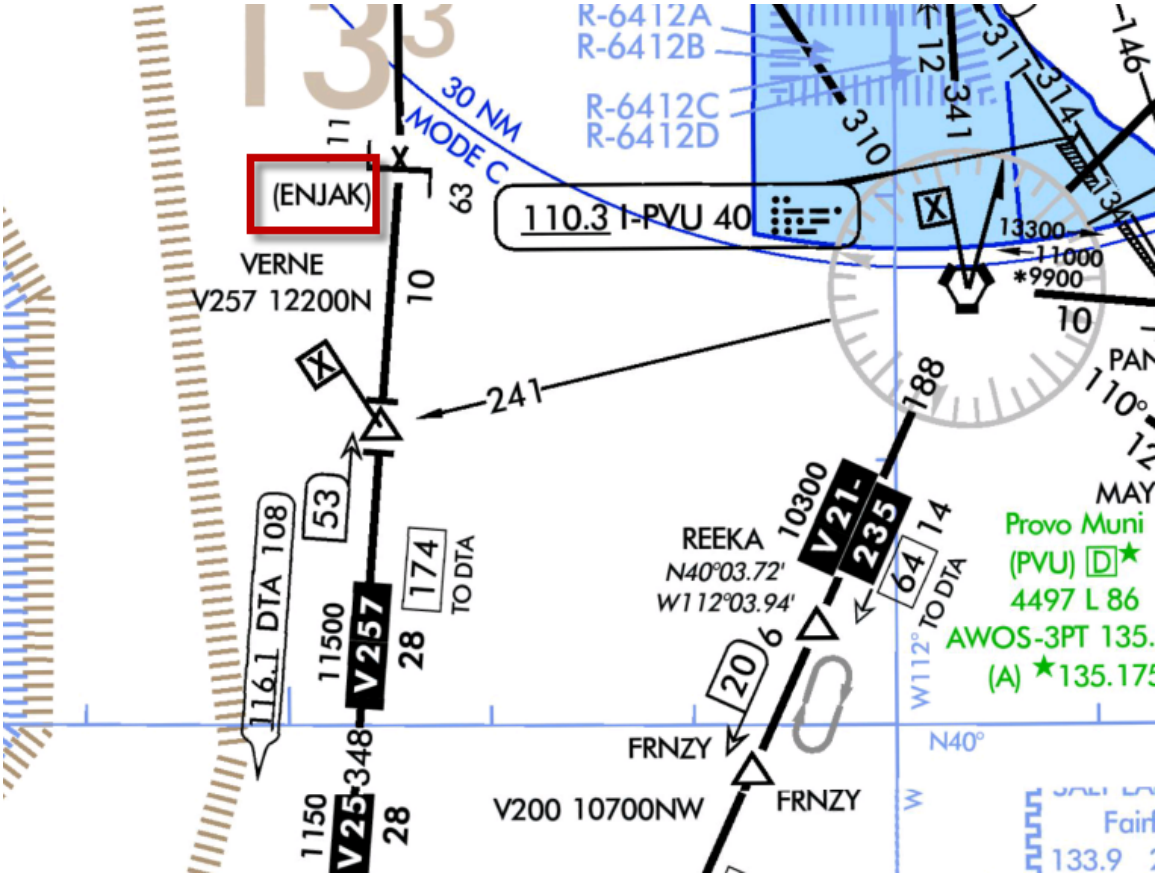
Modern RNAV FMS and GPS systems and ICAO standard PANS ATM Doc 4444 which defines the filing syntax for ICAO flight plans is based on point to point navigation and does not support the use of radial routes or airway to airway syntax without specifying an entry_fix and exit_fix for each airway. Neither does CPDLC. So use of a CNF, rather than a named fix, can cause issues with these routes. The current charting standards shows CNF fixes that are included in routes to be charted in parenthesis.

Examples of CNF used in routes:

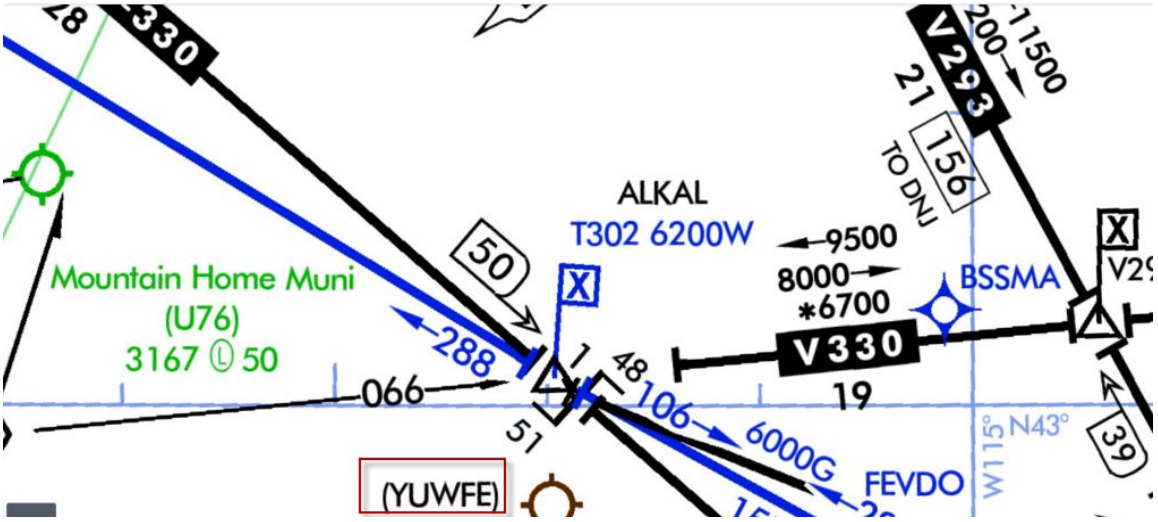
ODUCE used as a junction between J202 and J173 and as a dog leg on J202



ENJAK on V257 dog leg:



YUWFE dog leg on V330, junctions



US Canada Border

Since CNF are not ICAO standard when used in an airway, international routes with CNF included in the route to join airways or for bends in airways may cause the route to be rejected when filed by FIR/ARTCC outside of the US, making filing some otherwise correct routes unavailable. If the CNF is replaced by a named fix, these routes would be accepted.

Recommendations:

At a minimum, the AIM guidance should be updated to state that CNF, if used in an airway may be filed and will be included in databases. Preferably, the CNF used in airway junctions and in dog legs should be replaced by named fixes to be compatible with NextGen systems and ICAO. The same should apply to fixes at the US/Canada border, either named fixes should replace the CNF, the CNF eliminated if possible, and when Canada has eliminated the airway on the Canadian side of the border, the airway segment to the nearest fix or Navaid should be eliminated.

Comments:

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Date: Sept 28, 2021

Initial meeting 21-02: John Collins, Foreflight, briefed the issue from his RD slide, showing the Pilot Controller Glossary (PCG) definition of a computer navigation fix (CNF), adding they are not used in ATC communications or databases. There are hybrids, however, since CNFs are being used on airway junctions (without a fix), airway doglegs (allowing for point-to-point navigation), and along the US-Canada border. Some flight management systems (FMSs) will process an airway without an airway-to-airway junction (fix), however many systems (most general aviation) follow the ICAO syntax conventions (fix-airway-fix) and require a fix. Controller pilot data link communications (CPDLC) guidance for filing flight plans says to not use airway-to-airway syntax without a fix, which is most likely why these were added into the National Airspace System (NAS). John discussed the fix ODUCE which is depicted as a CNF from the slide. John was told by En Route Automation Modernization (ERAM) programmers the waypoint ODUCE in their system will not show as a CNF. John then discussed fixes ENJAK and YUWFE from the slide, both used as CNFs. John showed examples of CNFs at the US-Canada border, showing CFWCD (a CNF) and TALNO (a waypoint) on opposite sides of the US-Canada border and in very close proximity to one another. Canada does not adapt our CNF fixes since they are not ICAO standard, which can cause filing errors. John discussed his recommendation from the slide. Joshua Fenwick, Garmin, supported the

idea of using named fixes but added we are running out of names. In addition, he said there are often MOCA/airspace changes at the border that require a fix to delineate the change point. John suggested better coordination with Canada could help. Rich Boll, NBAA, discussed ADS-B issues on some airways over the border, suggesting some waypoints might be required to support processing. Diane Adams-Maturo, FAA Flight Procedures and Airspace Group (FPAG), is leading an ATS routes working group, and said these issues have been brought up already within the work group. Though this was discussed as a side issue, she suggested this could be addressed as part of the work group efforts. Paul Gallant, FAA Airspace Rules and Regulation Team (AJV-P210), advised his group does Part 71 rulemaking for ATS routes, adding routes do not use any CNFs. In addition, many legal airway descriptions do not contain every fix on the airway, just the defining NAVAIDs and defining fixes. Gary Fiske, FAA ATC Procedures (Terminal) Team (AJV-P310), said he would be opposed to any change to make CNF fix names pronounceable. These fixes were not designed for that purpose, but were designed strictly for the aircraft to process the route, adding ERAM does not require the fix names to be pronounceable. He stated he would have a problem using these for ATS purposes, since there are other methods. Gary also did not understand the purpose for the existence of ODUCE as a CNF (later shown to be a CNF over 24 years old). Current criteria requires all CNFs should utilize the naming convention CFxxx. Tom Carrigan, FAA Charting Systems Team (AJV-A260), provided additional background regarding border crossing fixes that 4-5 years ago all foreign data was removed from NASR, and a point was needed to define an airway end-point at the border as end of the airway. Doug Willey, Air Line Pilots Association, said these waypoints originally were added to support performance-based navigation (PBN) operations, and asked if they are still necessary. Bruce McGray, FAA Flight Operations Group (FOG), commented many times these county border fixes are changeover points and may need to be pronounceable. Jeff Rawdon, FPAG, said border crossing is an issue currently being considered by the ATS Routes Working Group. Diane reminded the group that Victor and jet routes are not PBN routes, and have to be defined by NAVAIDs and intersections. Waypoints will not be added to Victor routes. Dan Wacker, FPAG, said the criteria for airways was designed years ago and ATC has changed, adding the ATS Routes Working Group is looking at guidance in all applicable directives and it will take time to work through these issues.

Actions: Issue accepted for continuation on the agenda. The ATS Routes Working Group will consider the issue and report status at the following meeting.

Status: Item open

Meeting 22-01: Jeff Rawdon, FAA Flight Procedures and Airspace Group (FPAG), briefed the issue (slide). No ACM Recommendation Review Group (ARRG) review was needed, since, the issue is already an item to be addressed by the ATS Routes Working Group. Diane Adams-Maturo, FPAG, said the issue has not yet been discussed due to other higher priority issues, but it will be investigated. John Collins, Foreflight, said the issue is mostly transitions at the Canadian border, including problems processing CPDLC and ADS-C messages, and asked what the plan was. Dan advised since there has been no

identified safety case, the issue will be worked as time allows, but it has been adopted to be worked. Rich Boll, NBAA, inquired if this was coordinated with the Datacom Program Office. Diane said airways terminate at the border, and these CNF fixes are not on the airways. Bennie Hutto, NATCA, asked if the Working Group has coordinated with the ERAM group for processing, and Dan said not yet. Dan added this could require rulemaking action. John explained all of the CNFs are adapted in ERAM, and in the NASR database describing the airways. They are not adapted in Toronto's airspace, which causes the issues. In some instances, there are two fixes in close proximity. John thought one possible solution would be for the FAA to provide the CNF fix data to Canada to adapt in their systems. Diane said that some form of joint use is being looked at, but has not been worked out yet. Dan added there are several issues involved, including some outdated CFR guidance.

Actions: The ATS Routes Working Group will work this issue as it is able. FPAG will report continuing work of the ATS Routes Working Group on this issue.

Status: Item open.
