

**The use of charts to validate navigation
database information**

PARC-ACF Navigation Data Currency WG (NDCWG)

- Five NDCWG telecoms held between May & October 2008
- Representatives on telecoms from:
FAA, NBAA, ATA, Jeppesen, NACO, NGA, DOD, ICAO, ALPA

Note of thanks to Jeppesen and NACO for chart support

Results: A proposed charting solution developed by group to enable 'validation' of expired database content (for Instrument Approach Procedures)

NDCWG – Flight Plan

- Brief PARC – Seek PARC approval 9 October ✓
- Brief Air Charting Forum (ACF) – 22 October 2008
- Coordinate/forward U.S. solution to ICAO
- Implement solution – Charting agencies (Jeppesen/NACO/NGA)
- Commence work on en route “validation” issue

PARC-ACF Navigation Data Currency WG (NDCWG)

Recap of Issue

FAR 91.503(a) states:

“The pilot in command of an airplane shall ensure that the following flying equipment and aeronautical charts and data, in current and appropriate form, are accessible for each flight at the pilot station of the airplane.”

PARC-ACF Navigation Data Currency WG (NDCWG)

Guidance Material Review

AC 90-96A

If during the flight the AIRAC cycle changes, operators should establish procedures to ensure the accuracy of navigation data, including suitability of navigation facilities used to define the route of flight, and approach. Traditionally, this has been accomplished by verifying electronic data against paper products. An acceptable means is to compare aeronautical charts (**new and old**) to verify navigation fixes prior to dispatch. **If an amended chart is published for the procedure, the data within the database shall not be used to conduct the operation.**

AC 90-100A

One acceptable means is to compare aeronautical charts (**new and old**) to verify navigation fixes prior to dispatch. **If an amended chart affecting navigation data is published for the procedure, the database must not be used to conduct the procedure**

ICAO (PBN Manual) - AN 1 1145-07122

One acceptable means is to compare aeronautical charts (**new and old**) to verify navigation fixes prior to dispatch. **If an amended chart is published for the procedure, the database must not be used to conduct the operation.**

EASA AMC 20-26 (NPA 2008 -14)

One acceptable means is to compare aeronautical charts (**new and old**) to verify navigation fixes prior to dispatch. **If an amended chart is published for the procedure, the database must not be used to conduct the operation.**

Similar wording in AC 90-101, TGL-10, TGL-26

PARC-ACF Navigation Data Currency WG (NDCWG)

FAA Aeronautical Information Manual (AIM)

Section 1-2-6

Pilots must ensure their onboard navigation data is current, appropriate for the region of intended operation, and includes the navigation aids, waypoints, and relevant coded terminal airspace procedures for the departure, arrival, and alternate airfields.

NOTE The navigation database should be current for the duration of the flight. If the AIRAC cycle will change during flight, operators and pilots should establish procedures to ensure the accuracy of navigation data, including suitability of navigation facilities used to define the routes and procedures for flight. Traditionally, this has been accomplished by verifying electronic data against paper products. One acceptable means is to compare aeronautical charts (new and old) to verify navigation fixes prior to departure. If an amended chart is published for the procedure, the operator must not use the database to conduct the operation

PARC-ACF Navigation Data Currency WG (NDCWG)

BY ORDER OF THE
SECRETARY OF THE AIR FORCE

AIR FORCE INSTRUCTION 11-202, VOLUME 3
1 JUNE 1998



Flying Operations

GENERAL FLIGHT RULES

COMPLIANCE WITH THIS PUBLICATION IS MANDATORY

2.1.2. Publications. ,, If an electronic navigation system database is used, **the PIC will ensure it is current.**

5.8.3.2.1.2. GPS approaches will not be flown with an expired database.

5.8.4.1. Expired Database. If the database has expired, the PIC:

- May continue a mission with an expired database, **if the database information required for the flight can be verified with current FLIP.**
- Shall get the database updated at the first opportunity.
- Will not fly GPS approaches.

PARC-ACF Navigation Data Currency WG (NDCWG)

Current FAA and international guidance for out-of-date databases addresses:

- Prohibition on use of a procedure if it has been amended**
- Requirement to “validate” database using charts**

• Proposed solution enables charts to validate navigation database currency for Standard Instrument Approach Procedures

- Proposed solution accommodates all operators**
- Proposed solution simplifies operator/pilot verification of database data**

PARC-ACF Navigation Data Currency WG (NDCWG)

A M E N D 1	B	
	C	
	D	
TERPS	1	Missed approach
	2	Missed approach
CHANGES: Procedure.		

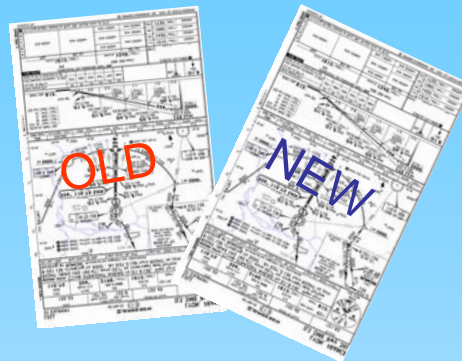
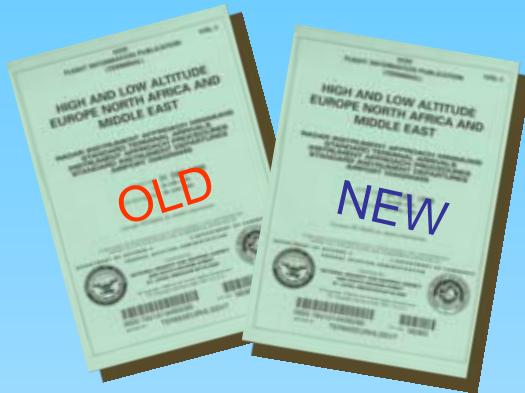
Jeppesen Format

ATLANTA, GEORGIA
Amdt 2 04218

NACO/NGA Format

Currently - An operator can only determine if a procedure amendment has been “up-numbered” during a chart cycle by comparing old and new charts

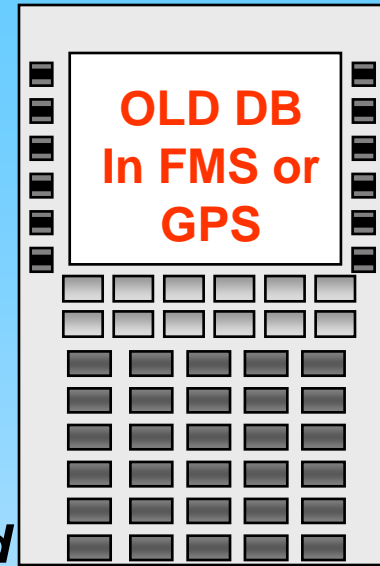
PARC-ACF Navigation Data Currency WG (NDCWG)



“Validate”



OLD DB
In FMS or
GPS



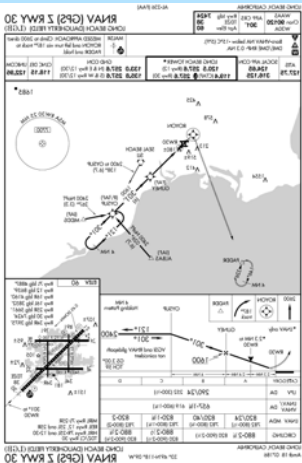
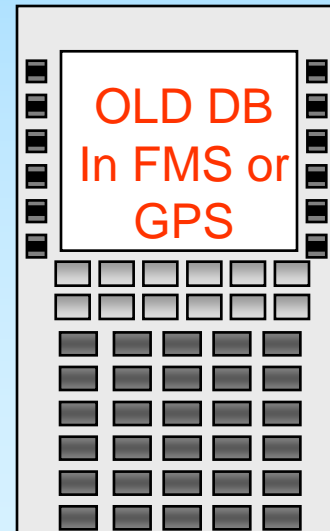
***Determining whether an amendment has been up-numbered
- Not practicable – Not complied with***

“Validate”



- Fix can move – name remains unchanged (no lat/long)
- Courses on chart may not exactly match FMS/GPS
- Many FMS do not identify Fly-Over attribute on display
- Etc

OLD DB
In FMS or
GPS

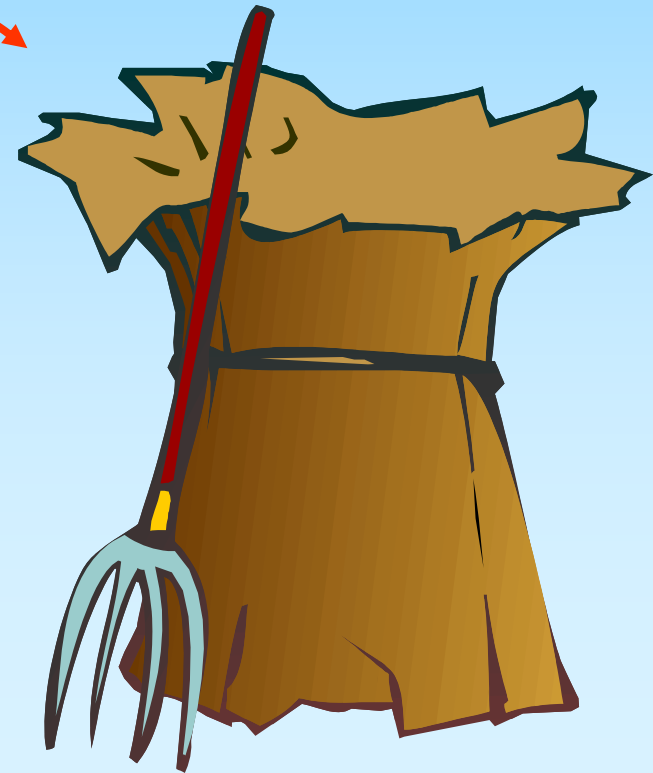


Fix and database content validation - Not possible for some database elements

PARC-ACF Navigation Data Currency WG (NDCWG)


Pilot “validation” of data on the chart

- Geodetic location
- Courses
- Distances
- Fly-Over Attribute
- Altitudes
- Holding Attributes (Direction/Length)
- Etc



PARC-ACF Navigation Data Currency WG (NDCWG)

Proposed solution (IAPs) = Publish date associated with amendment # on chart



(TERPS) AMEND 2 25 SEP 08	A	RVR 50 or 1
	B	
	C	
	D	
		RVR 60 or 1 1/4
		1 1/2

© JEPPESEN, 2008. ALL RIGHTS RESERVED.

EAGLE, COLORADO
Orig-B 18 OCT 01 07018

39°39'N-106°55'W

EAGLE COUNTY REGIONAL (EGE)
LDA/DME RWY 25



Result

Pilot – Operator knows the date the procedure was amended (without checking old and new charts)

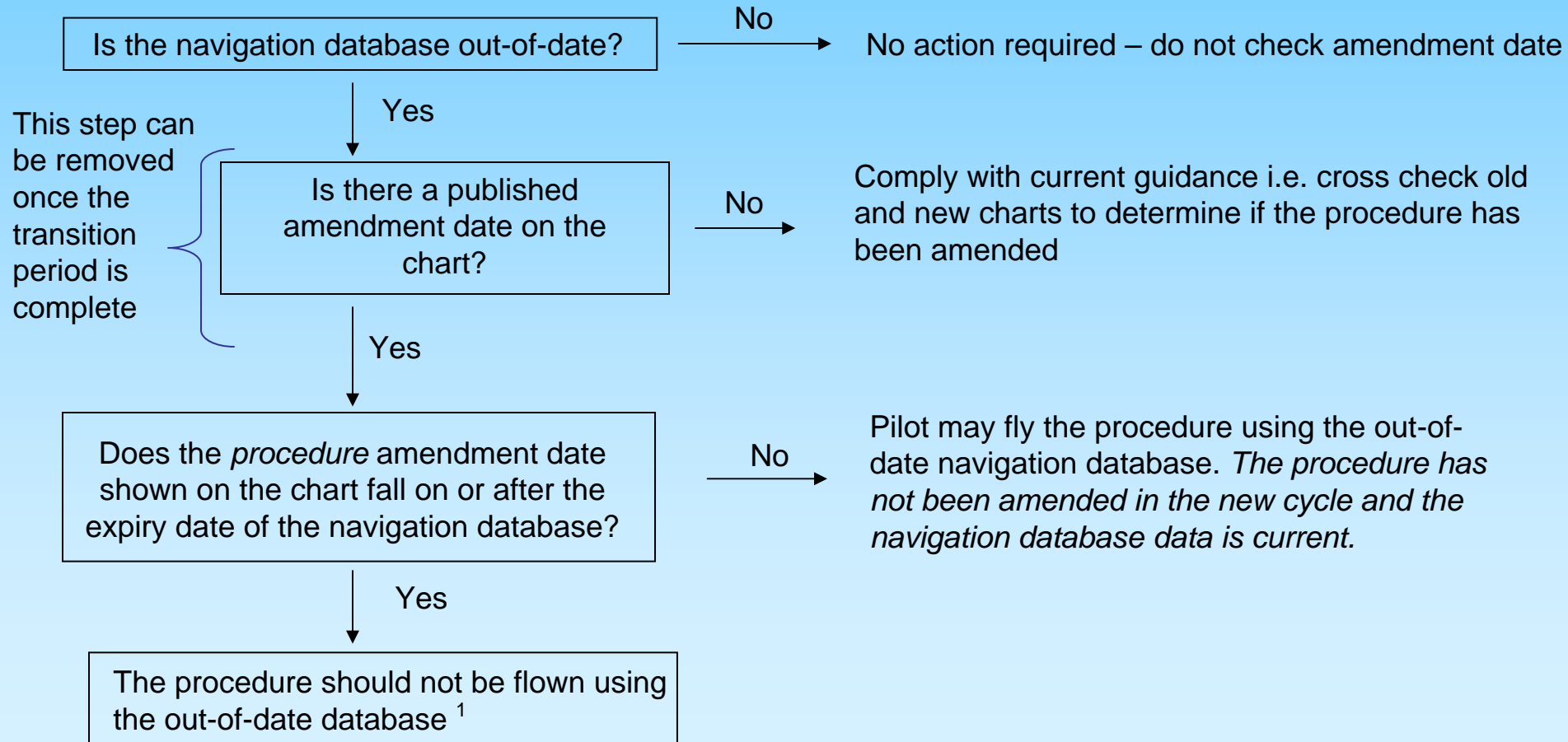
therefore

Pilot knows if procedure in the (expired) database is no longer valid

PARC-ACF Navigation Data Currency WG (NDCWG)

Operating with an Out-of-date Navigation Database – Pilot Guidance

* It is assumed that the pilot has a current electronic or paper chart



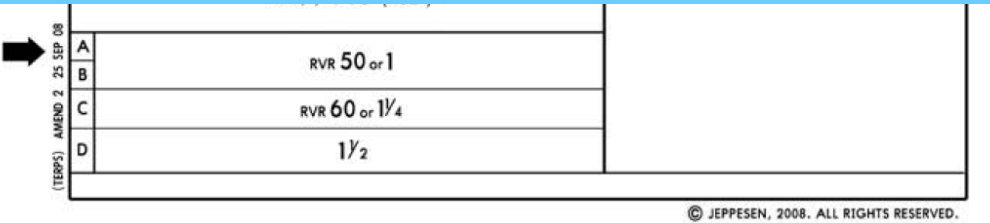
¹ – Operators, with FAA approval, may develop procedures to permit use of the database after ascertaining the reason for the amendment and determining the ARINC 424 (FMS) path is not affected.

PARC-ACF Navigation Data Currency WG (NDCWG)



Database (AIRAC) Date displayed on FMS

PARC-ACF Navigation Data Currency WG (NDCWG)



TERPS AMEND 2 25 SEP 08

A	RVR 50 or 1
B	
C	RVR 60 or 1 1/4
D	1 1/2

© JEPPESEN, 2008. ALL RIGHTS RESERVED.

Database Expired: 25 SEP 08

Chart Amendment Date: 25 SEP 08

Is the navigation database out-of-date?

No

No action required – do not check amendment date

Yes

Is there a published amendment date on the chart?

No

Comply with current guidance i.e. cross check old and new charts to determine if the procedure has been amended

Yes

Does the *procedure* amendment date shown on the chart fall on or after the expiry date of the navigation database?

No

Pilot may fly the procedure using the out-of-date navigation database. *The procedure has not been amended in the new cycle and the navigation database data is current.*

Yes

The procedure should not be flown using the out-of-date database ¹

¹ – Operators, with FAA approval, may develop procedures to permit use of the database after ascertaining the reason for the amendment and determining the ARINC 424 (FMS) path is not affected.

PARC-ACF Navigation Data Currency WG (NDCWG)

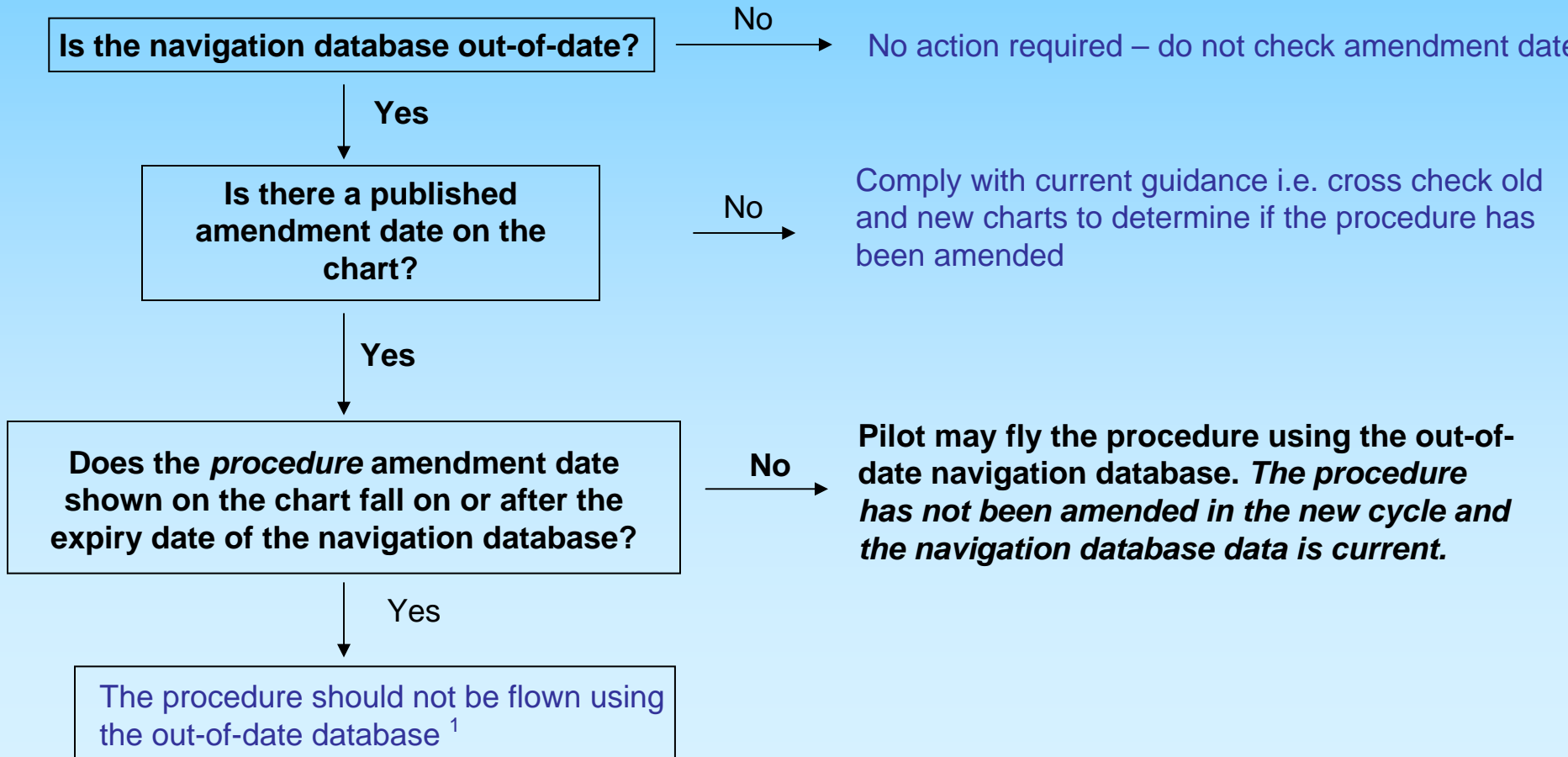
EAGLE, COLORADO
Orig-B 18 OCT 01 07018

39°39'N-106°55'W

EAGLE COUNTY REGIONAL (EGE)
LDA/DME RWY 25

Database Expired: 25 SEP 08

Chart Amendment Date: 18 OCT 01



PARC-ACF Navigation Data Currency WG (NDCWG)

Procedures amended by - P NOTAM

P - NOTAM is “effective upon publication”. To maintain standardized amendment date across charting agencies the “FDC Date” associated with the P- NOTAM will be used in association with the amendment number

By amending: §97.23 VOR, VOR/DME, VOR or TACAN, and VOR/DME or TACAN; §97.25 LOC, LOC/DME, LDA, LDA/DME, SDF, SDF/DME; §97.27 NDB, NDB/DME; §97.29 ILS, ILS/DME, ISMLS, MLS/DME, MLS/RNAV; §97.31 RADAR SIAPs; §97.33 RNAV SIAPs; and §97.35 COPTER SIAPs, Identified as follows:EFFECTIVE UPON PUBLICATION					
FDC Date	STATE	CITY	AIRPORT	FDC NUMBER	SUBJECT
09/25/08	CO	RIFLE	GARFIELD COUNTY REGIONAL	8/0726	RNAV (RNP) Z RWY 26, ORIG
09/25/08	CO	RIFLE	GARFIELD COUNTY REGIONAL	8/0727	RNAV (RNP) Y RWY 26, ORIG

PARC-ACF Navigation Data Currency WG (NDCWG)

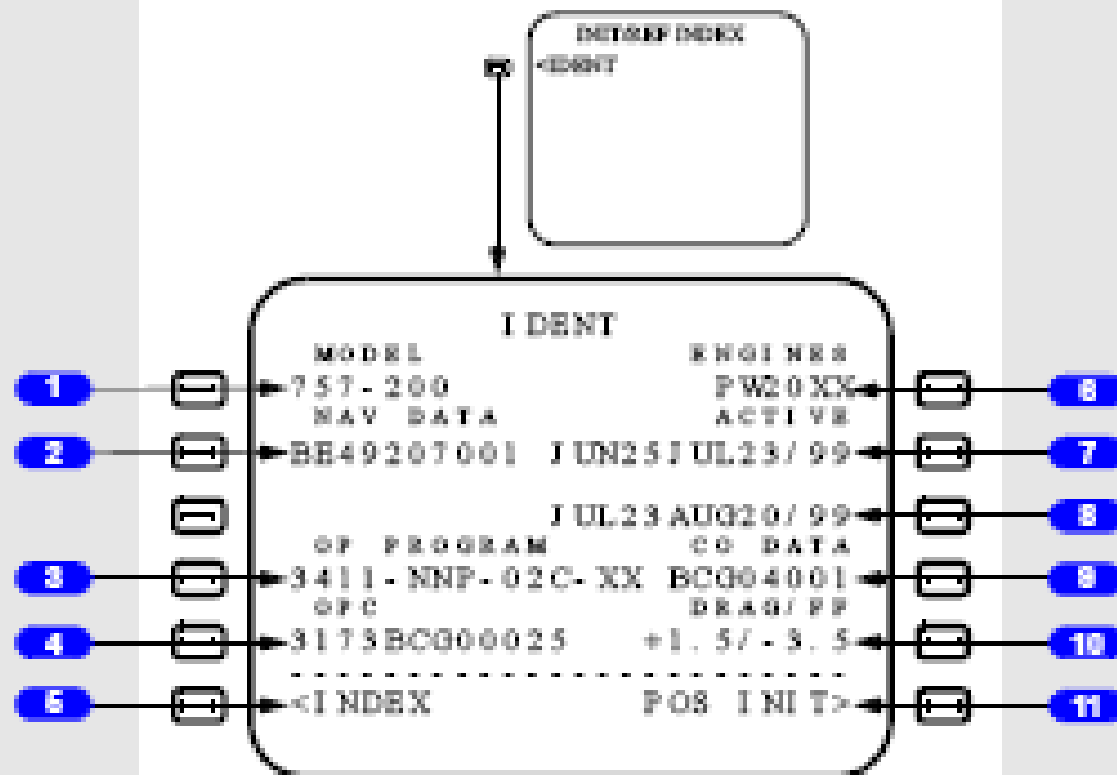
Next Steps

1. Brief ACF – Obtain formal approval for charting change
2. Coordinate with ICAO
 - ICAO does not use “Amendment” notation in charting
 - Jeppesen indicates that they will incorporate date schema on overseas charts as ‘value added’ feature for customer
3. Back brief NDCWG on PARC & ACF results (31 October 2008)
4. Start working on en route issue (2009)

Questions?

PARC-ACF Navigation Data Currency WG (NDCWG)

PARC-ACF Navigation Data Currency WG (NDCWG)



PEGASUS FMC