

# DoD Maint Symposium

5Dec2017

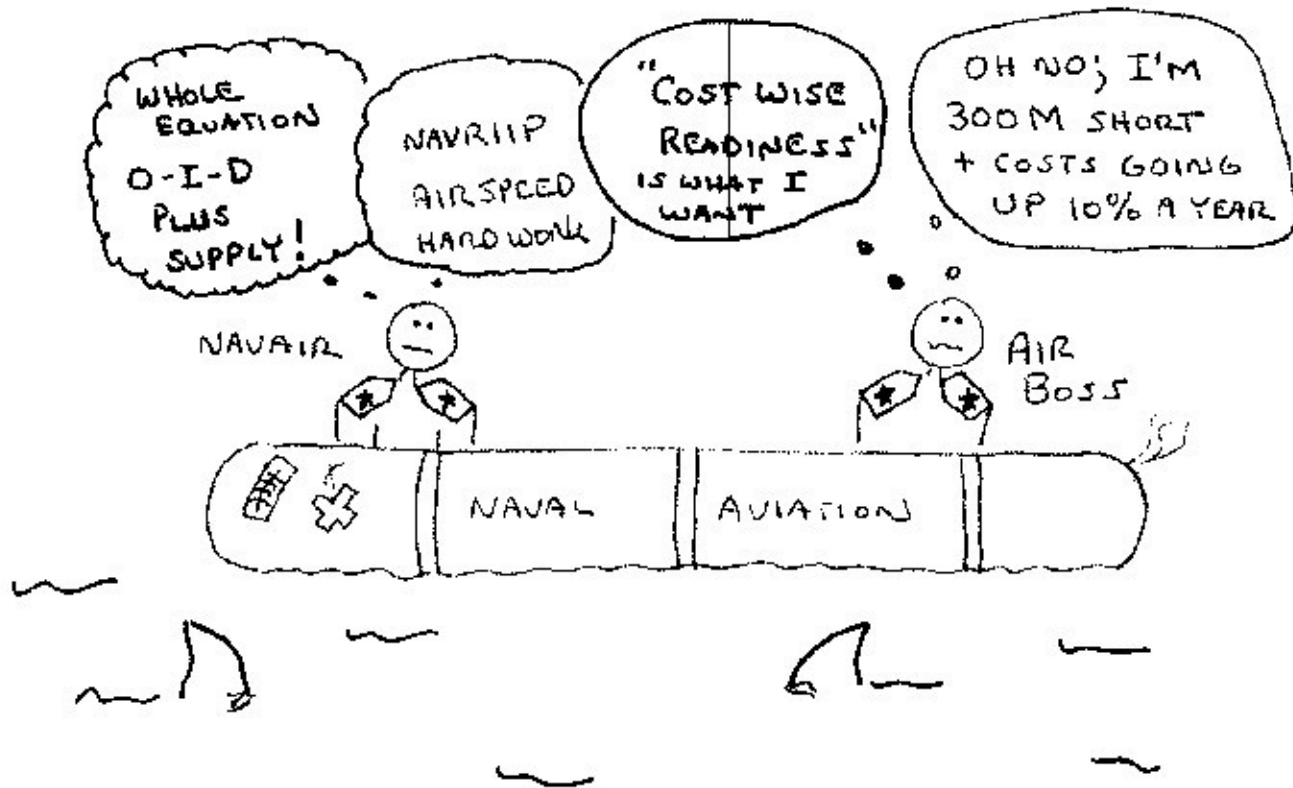
- Break Out Session – “Employing Deep Analytics to Drive Informed Logistics, Sustainment Decisions, and Strategies”

Stu Paul @ OPNAV N832 U.S. Navy

‘Aviation Fleet Readiness’

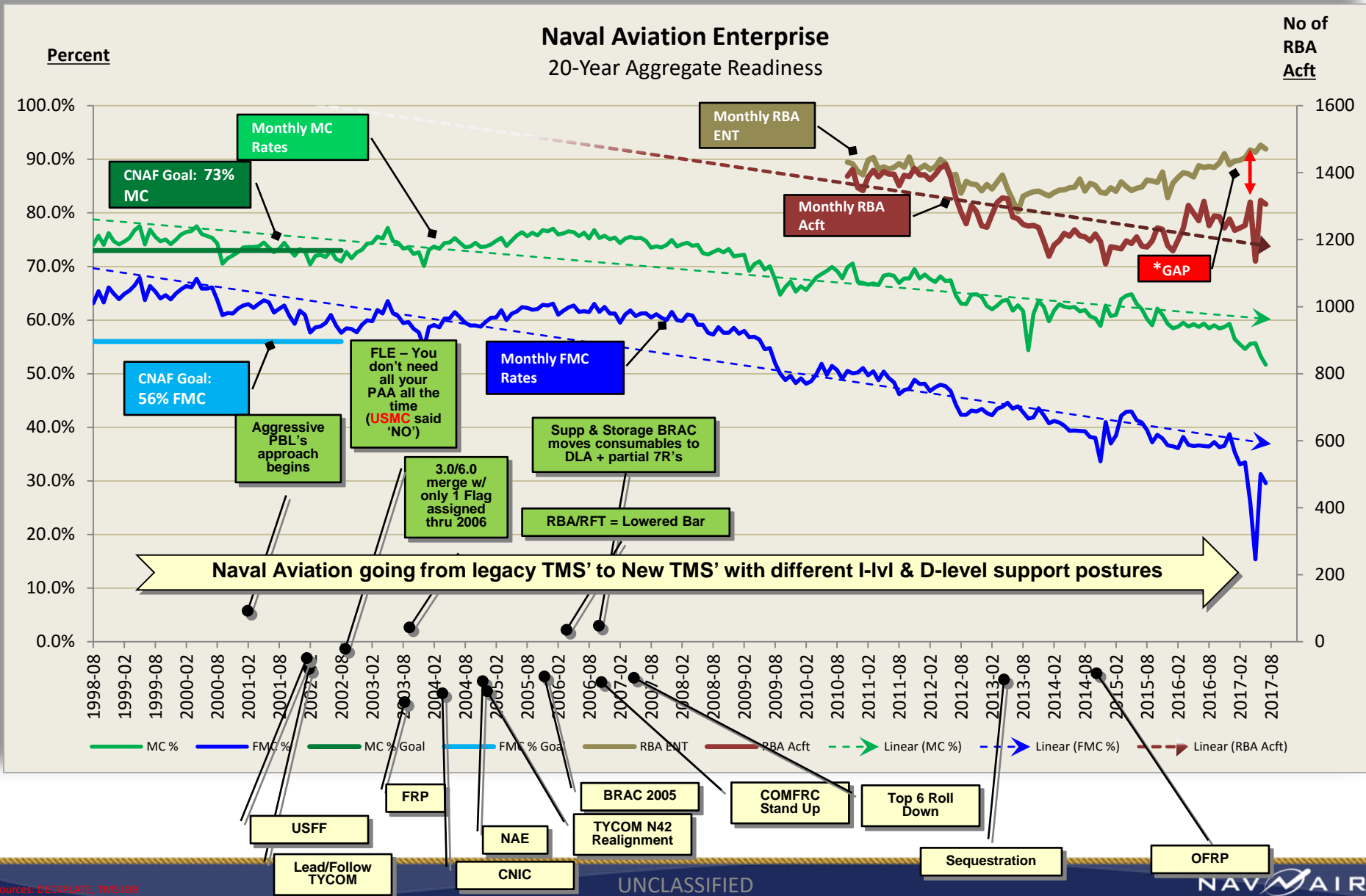
<stuart.paul@navy.mil>

# 'Gotta Have' → Cost-Wise-Readiness



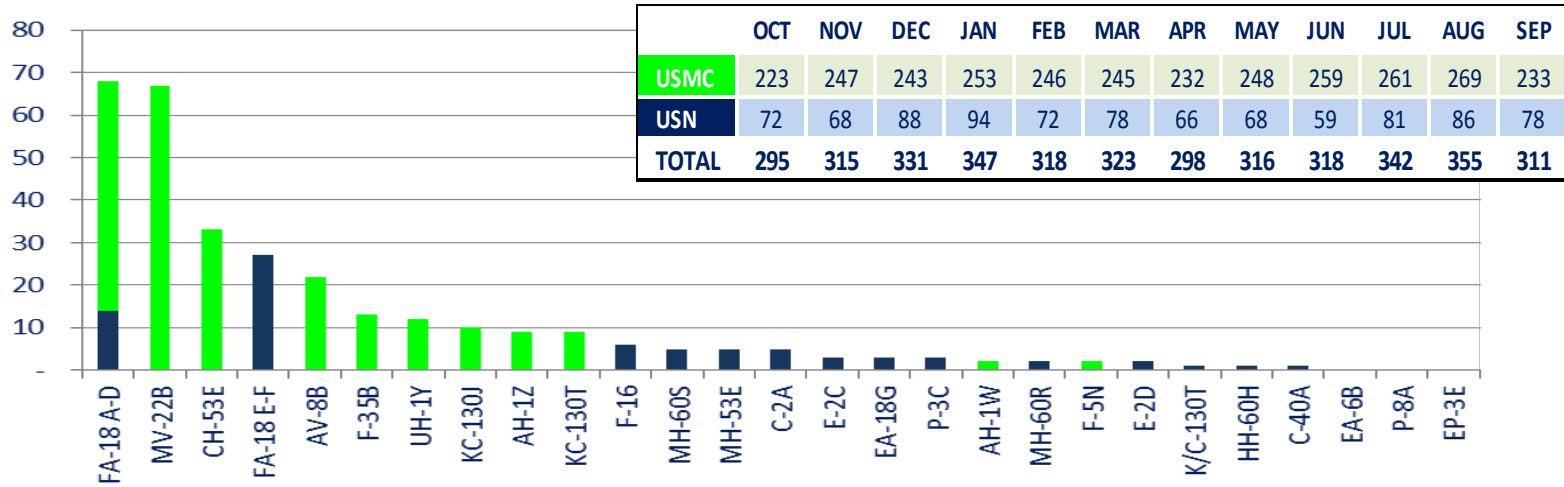
STU-25 SEP03

# NAE Readiness

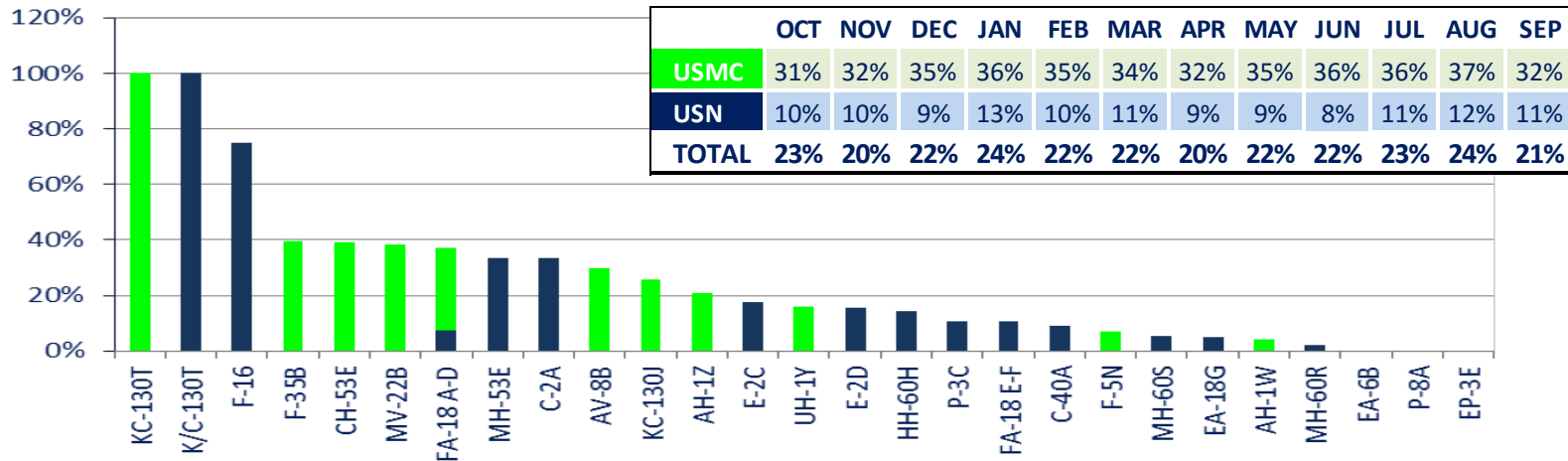


# Naval Aviation Readiness Snapshot

## Ready Basic Aircraft Gap # Aircraft



## Ready Basic Aircraft Gap % Requirement



# F/A-18 E-F

September ASD & AMDB RBA trend through 31 Oct 2017

## FA-18 E-F



Out of Reporting (OOR): 65  
Data Source: DECKPLATE

Monthly Average  
Depot: 38 As of Date: September 2017

13	4	5	16	0	19	8	226	27	23	0	6	13	82	128	18	3
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TFA: 19 - OA: 8 As of Date: September 2017

19	8
----	---

OOR Long Term Down: 55 Actuals as of: September 30 2017

90-179 days	180-365 days	1-2 yrs	2-3 yrs	>3 yrs
10	10	9	2	24

Legend

13	Planned Maintenance Interval (PMI) Depot
4	Planned Maintenance Interval (PMI) Field
5	Special Re-Work (SRWK)
16	Modification (MOD)
0	In Service Repair (ISR)
19	To From Awaiting (TFA)
8	Other Aircraft (OA)
226	Ready Basic Aircraft (RBA)
27	RBA Gap
23	RBA Above Standard
0	FCF Required
6	Day Visual Flight Rules (VFR)
13	Other Mission Capable
82	Non-Mission Capable Maintenance (NMCM)
128	Non-Mission Capable Supply (NMCS)
18	In Reporting ISR (IRISR)
3	In Reporting Modification (IRMOD)

### RBA Gap Net Change



### NMCM Net Change



### NMCS Net Change



### IRISR Net Change



### OOR Net Change



In Reporting (IR): 478  
Data Source: AMSRR/TMS IDB

Monthly Average  
RBA: 226 - RBA Gap: 27 As of Date: September 2017

226	27
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226	27	23	0	6	13	82	128	18	3
-----	----	----	---	---	----	----	-----	----	---

RBA Above Std: 23 As of Date: September 2017

FCF Req: 0 - Day VFR: 6 - MC Other: 13 As of Date: September 2017

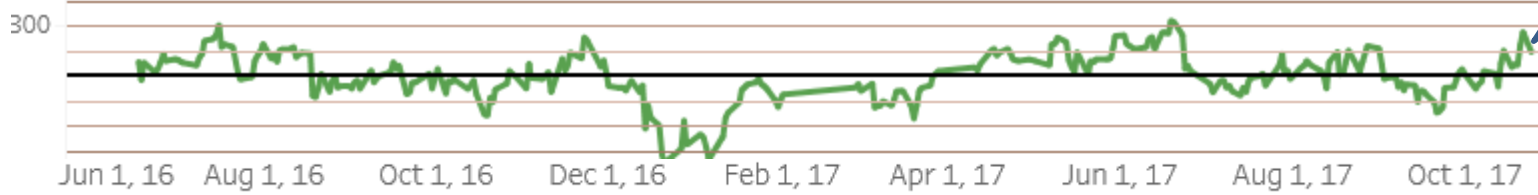
NMCM: 82 - NMCS: 128 As of Date: September 2017

82	128
----	-----

IR Long Term Down: 75 Actuals as of: September 30 2017

90-179 days	180-365 days	1-2 yrs	2-3 yrs	>3 yrs
21	13	13	4	24

10/31/17  
RBA = 287



# USMC F/A-18 A-D

## September ASD & AMDB RBA trend through 31 Oct 2017

### FA-18 A-D



Total USMC USN

**Out of Reporting (OOR): 100**  
Data Source: DECKPLATE  
Monthly Average  
Depot: 63 As of Date: September 2017

**ISR: 6** As of Date: September 2017

**TFA: 19 - OA: 12** As of Date: September 2017

**OOR Long Term Down: 104** Actuals as of: September 30 2017

90-179 days	180-365 days	1-2 yrs	2-3 yrs	>3 yrs
12	14	19	14	45

**Legend**

- 24 Planned Maintenance Interval (PMI) Depot
- 5 Planned Maintenance Interval (PMI) Field
- 4 Special Re-Work (SRWK)
- 30 Modification (MOD)
- 6 In Service Repair (ISR)
- 19 To From Awaiting (TFA)
- 12 Other Aircraft (OA)
- 81 Ready Basic Aircraft (RBA)
- 54 RBA Gap
- 2 RBA Above Standard
- 0 FCF Required
- 7 Day Visual Flight Rules (VFR)
- 0 Other Mission Capable
- 29 Non-Mission Capable Maintenance (NMCM)
- 54 Non-Mission Capable Supply (NMCS)
- 12 In Reporting ISR (IRISR)
- 0 In Reporting Modification (IRMOD)

**RBA Gap Net Change**

-14	16
Month	FY

**NMCM Net Change**

-6	-14
Month	FY

**NMCS Net Change**

-9	8
Month	FY

**IRISR Net Change**

-7	-4
Month	FY

**OOR Net Change**

2	0
Month	FY

**In Reporting (IR): 173**  
Data Source: AMSRR/TMS IDB  
Monthly Average  
RBA: 81 - RBA Gap: 54 As of Date: September 2017

**RBA Above Std: 2** As of Date: September 2017

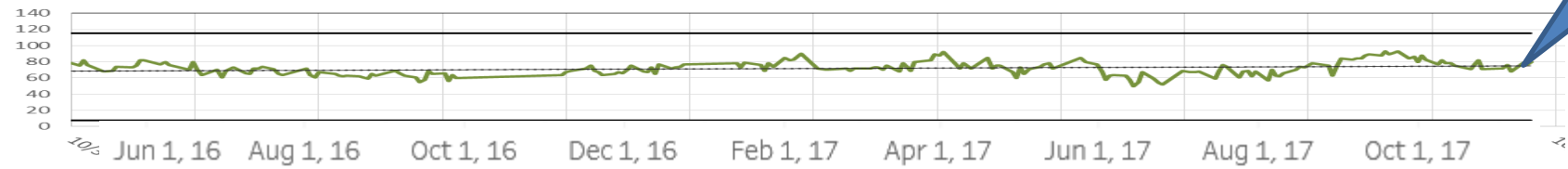
**FCF Req: 0 - Day VFR: 7 - MC Other: 0** As of Date: September 2017

**NMCM: 29 - NMCS: 54** As of Date: September 2017

**IR Long Term Down: 22** Actuals as of: September 30 2017

90-179 days	180-365 days	1-2 yrs	2-3 yrs	>3 yrs
7	3	4	6	2

**Reported RBA**  
RBA (AMSRR), +/- 2 sigma



10/31/17  
RBA = 74

# MV-22B

September ASD & AMDB RBA trend through 31 Oct 2017

## MV-22B



**Out of Reporting (OOR): 32**  
Data Source: DECKPLATE

**Monthly Average**  
Depot: 17 As of Date: September 2017

**TFA: 9 - OA: 6**  
As of Date: September 2017

**OOR Long Term Down: 30**  
Actuals as of: September 30 2017

90-179 days	180-365 days	1-2 yrs	2-3 yrs	>3 yrs
8	12	9	1	0

**Legend**

- 6 Planned Maintenance Interval (PMI) Depot
- 6 Planned Maintenance Interval (PMI) Field
- 0 Special Re-Work (SRWK)
- 5 Modification (MOD)
- 0 In Service Repair (ISR)
- 9 To From Awaiting (TFA)
- 6 Other Aircraft (OA)
- 108 Ready Basic Aircraft (RBA)
- 67 RBA Gap
- 0 RBA Above Standard
- 0 FCF Required
- 12 Day Visual Flight Rules (VFR)
- 4 Other Mission Capable
- 36 Non-Mission Capable Maintenance (NMCM)
- 67 Non-Mission Capable Supply (NMCS)
- 4 In Reporting ISR (IRISR)
- 4 In Reporting Modification (IRMOD)

**RBA Gap Net Change**

-9 Month      -2 FY

**NMCM Net Change**

-1 Month      1 FY

**NMCS Net Change**

-12 Month      -9 FY

**IRISR Net Change**

-1 Month      2 FY

**OOR Net Change**

-5 Month      10 FY

**In Reporting (IR): 227**  
Data Source: AMSRR/TMS IDB

**Monthly Average**  
RBA: 108 - RBA Gap: 67 As of Date: September 2017

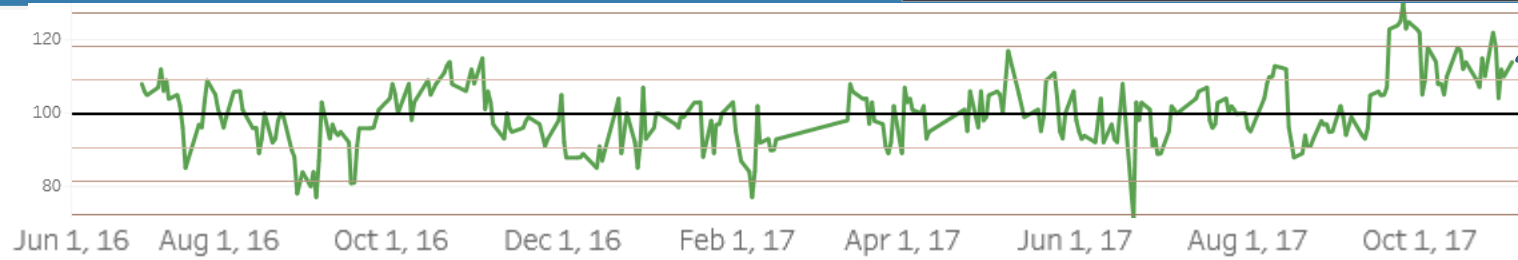
**FCF Req: 0 - Day VFR: 12 - MC Other: 4**  
As of Date: September 2017

**NMCM: 36 - NMCS: 67**  
As of Date: September 2017

**IR Long Term Down: 30**  
Actuals as of: September 30 2017

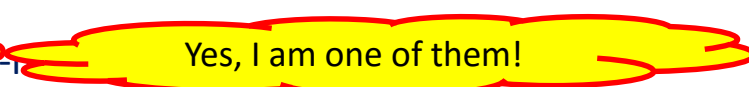
90-179 days	180-365 days	1-2 yrs	2-3 yrs	>3 yrs
12	8	7	2	1

10/31/17  
RBA = 115



# What Are Our Challenges?

( And how useable is all that data we have? )

- **Aircraft Management Dashboard (AMDB)** is a tool to prioritize aircraft and efforts required across the fleet to meet deployment and training requirements
- Started as a PMA261 effort to model H-53 aircraft, and later extended to the entire fleet
- Intent is to develop a **CONSISTENT** source of information for use across the entire fleet, at all levels (from Petty Officer to Engineer to Loggee to Admiral)
  - Limit confusion caused by looking at different data and different dates
- **Tableau AMDBs Online**
  - <https://datavis.navair.navy.mil/#/site/NAVAIREnterprise/projects>
  - 400 users (9/20/2017)
  - For access and all issues, e-r  Yes, I am one of them!
- **Continuing to produce MS Excel AMDBs in short term**
- **Web-based application (July '17) accessible to anyone with CAC**
  - Utilizes Tableau Reader data analysis software

User will not need 'Tableau' on their computer.

NAVAIR 6.8 has created "Quick Start Guides" for users to navigate the dashboards.



# Decision Knowledge Programming for Logistics Analysis and Technical Evaluation (DECKPLATE)

## 12 Elements of Logistics

**Integrated Product Support (IPS)**

**Technical Data/Publications**

**Manpower and Personnel**

**Facilities and Infrastructure**

**Packaging, Handling, Storage and Transportation (PHST)**

**Training and Training Support**

**Equipment Design**

**Computer Resources**

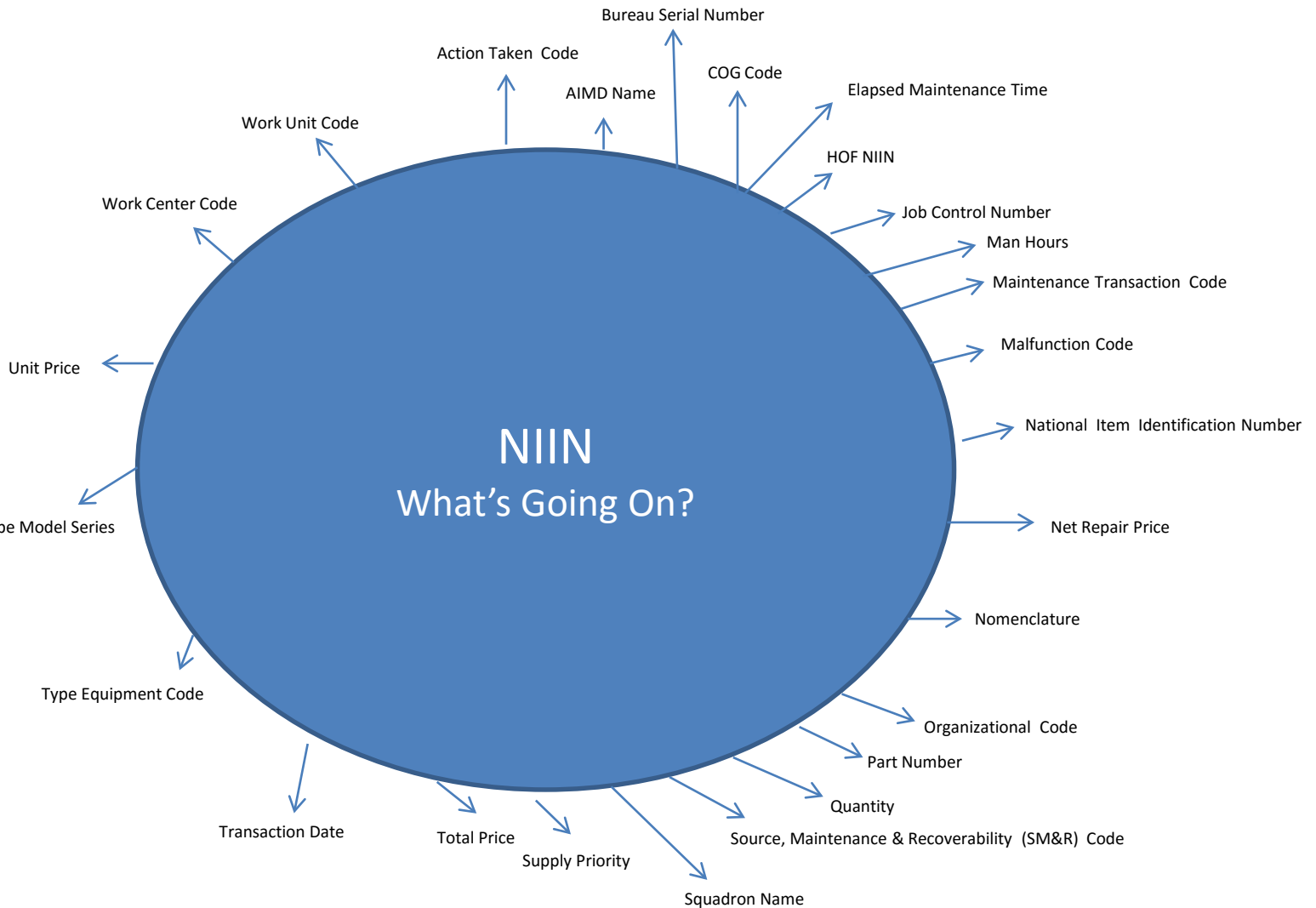
**Maintenance Planning and Management**

**Supplies**

**Support Equipment**

**Product Support Management**

**Sustaining Engineering**



# AMDB Data Sources

Element	Data Source
RBA Up/Down	Aviation Management Supply and Readiness Report (AMSRR)
Supply	Aviation Management Supply and Readiness Report (AMSRR)
Aircraft Inventory	Aviation Inventory and Readiness Reporting System (AIRRS) XRAY
Open Work Orders	DECKPLATE
Out of Reporting	Production Status Report (PSR)

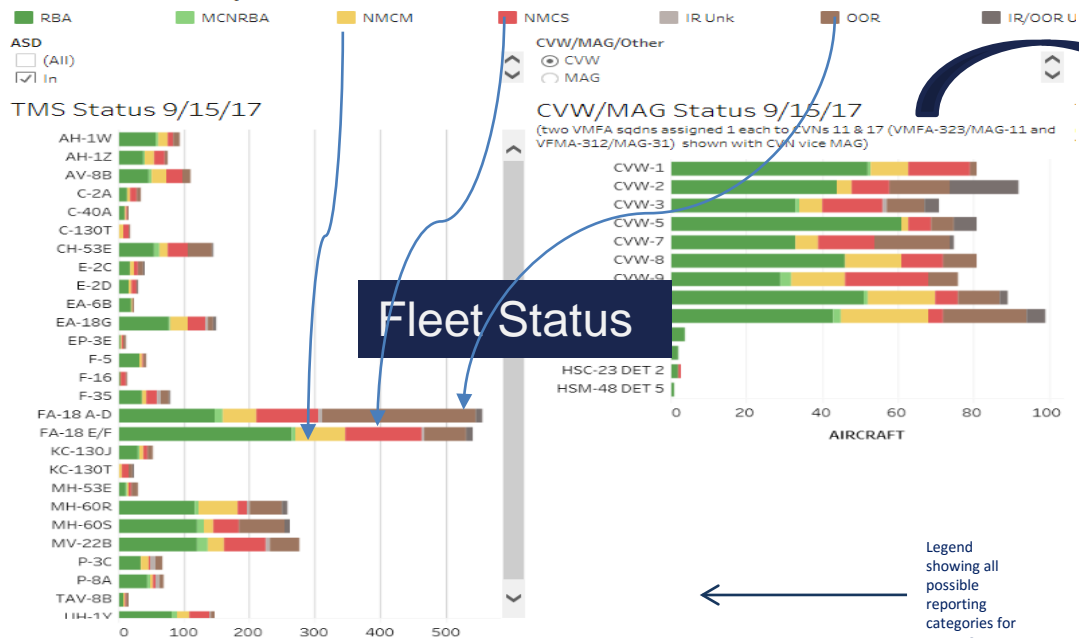
- **Data sources updated daily**
  - Data through previous day
- **Also pursuing the incorporation of JDRS (in service repairs), CMPPro (request for engineering information), OneNDMS (ML-3 data), and SAMS (F/A-18 scheduled maintenance inductions)**
- **Pursuing the integration with LOGCELL (Go NAVSUP!! :-> )**

# AMDB Views

## Acft Management Dash Board = Info Most Can Use

Latest reported readiness status (AMSRR/AIRRS) displayed by TMS and by CVW/MAW

### Aircraft Management Dash Board



Fleet Status

Wing Status

Squadron Status

AC Status

Open Reqs and Work Orders

### Readiness as reported

- AMSRR
  - Fleet report
- AIRRS
  - Inventory
- PSR
  - FRC Production Status
- DECKPLATE
  - Maint. work orders

### Drill down

- Fleet
- Wing
- Squadron
- BUNO #
- Parts & Open Maint

# Fleet Status

Latest reported readiness status (AMSRR/AIRRS) displayed by TMS and by CVW/MAG

## Aircraft Management Dash Board

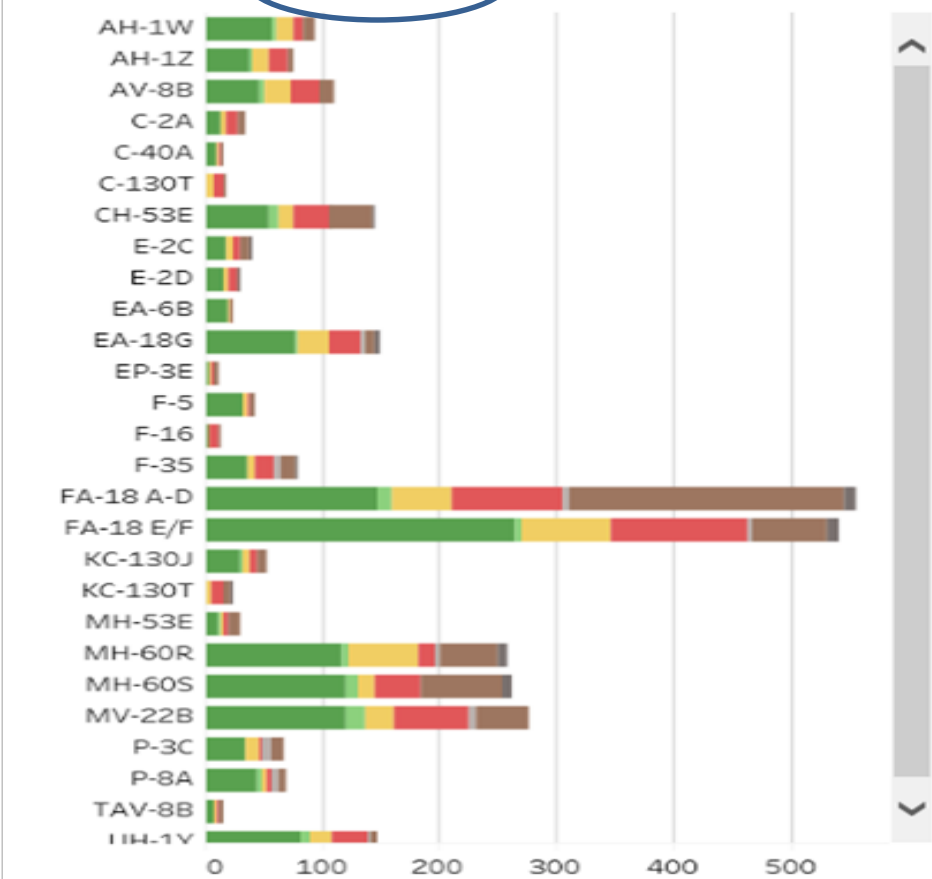
RBA MCMRBA NMCM NMCS IR Unk OOR IR/OOR U

ASD  
 (All)  
 In  
CVW/MAG/Other  
 CVW  
 MAG

Data Pull Date

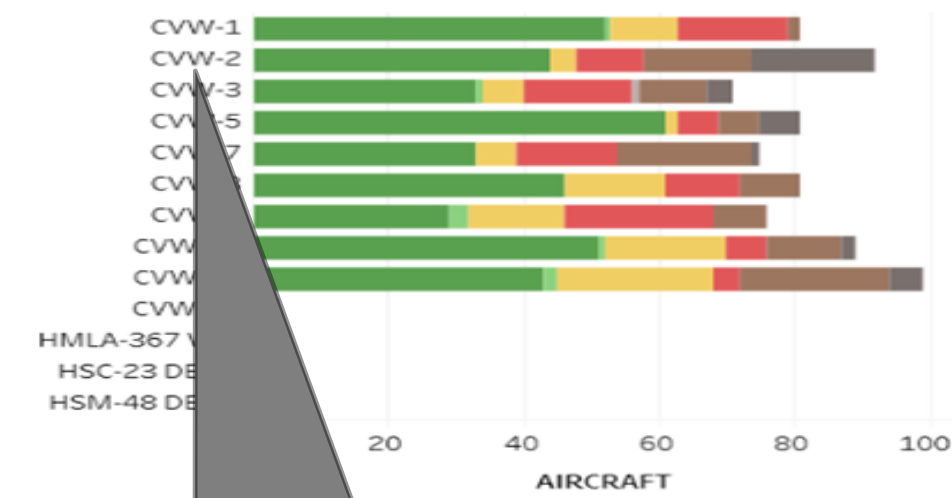
Navy or USMC

TMS Status 9/15/17



CVW/MAG Status 9/15/17

(two VMFA sqdns assigned 1 each to CVNs 11 & 17 (VMFA-323/MAG-11 and VFMA-312/MAG-31) shown with CVN vice MAG)

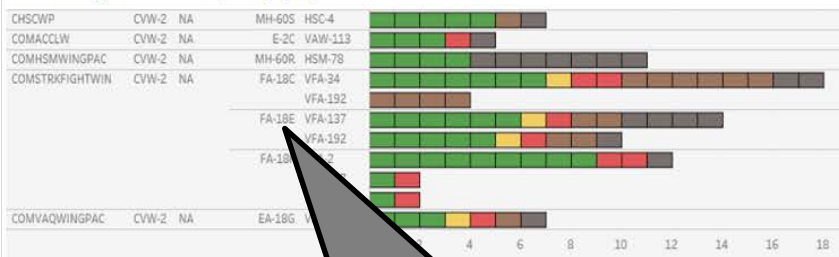


Selecting a specific CVW will show supply and maintenance detail

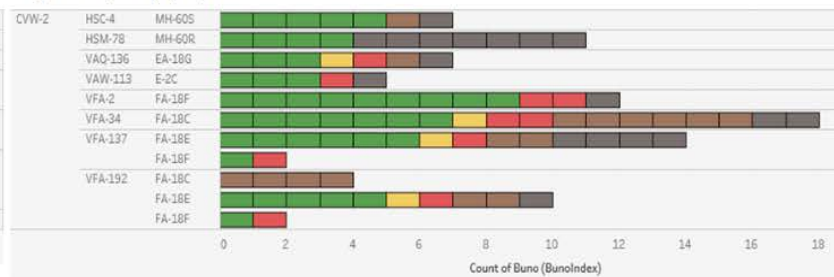
# Wing Status

## Latest reported readiness for CVW-2 by Squadron and TMS

All: All Wing/MAW Status (Fleet) 9/15/17

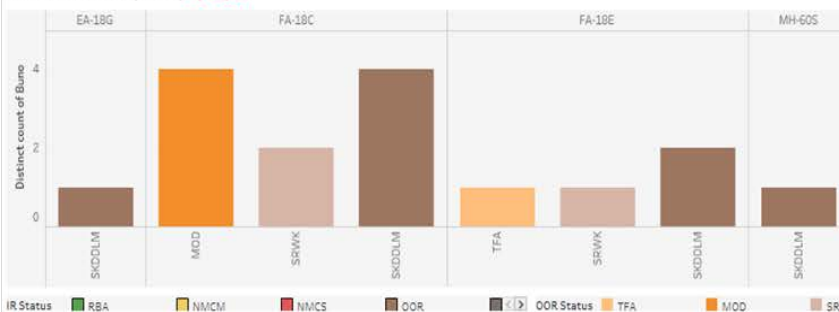


Org Status (Fleet) 9/15/17

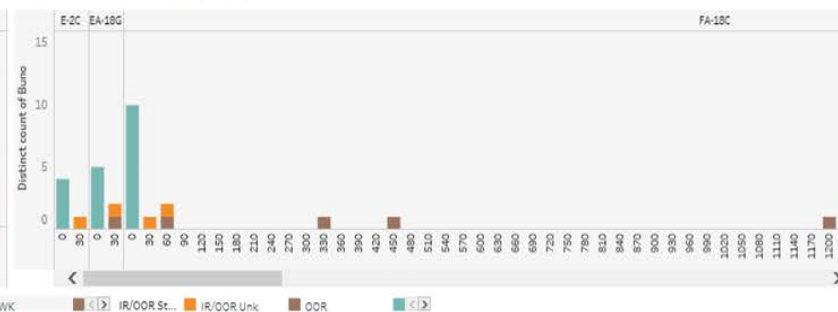


Selecting a specific squadron filters down to that specific squadron's detail

All OOR Status (Fleet) 9/15/17



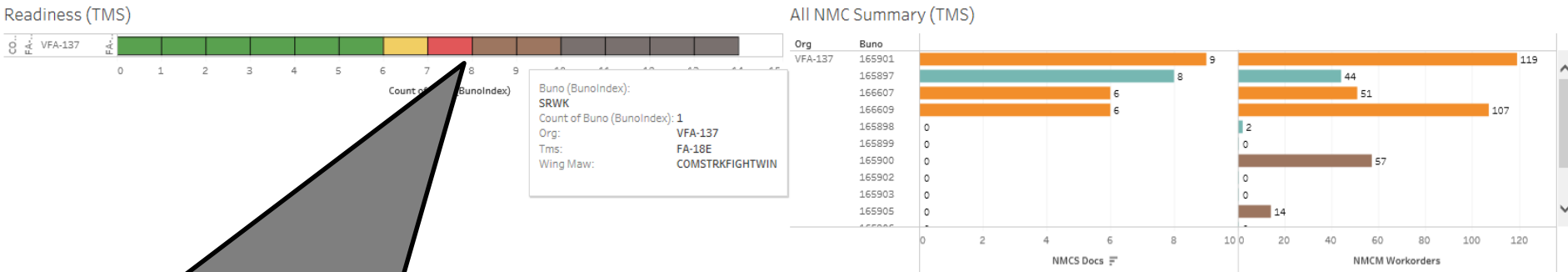
Days Since Last Flight (Fleet)



Using the mouse to click directly on "CVW-2" will drill down to a view displaying each individual squadron in that wing by squadron and TMS, separately. The same data is depicted in both panes, and this data is the same data set (AMSRR and AIRRS) used to build the previous view. From here, the user can click on any squadron or TMS. For this presentation, we selected VFA-137 as the drill down target. Clicking on VFA-137 takes us to the next level of detail, showing readiness data for the selected squadron.

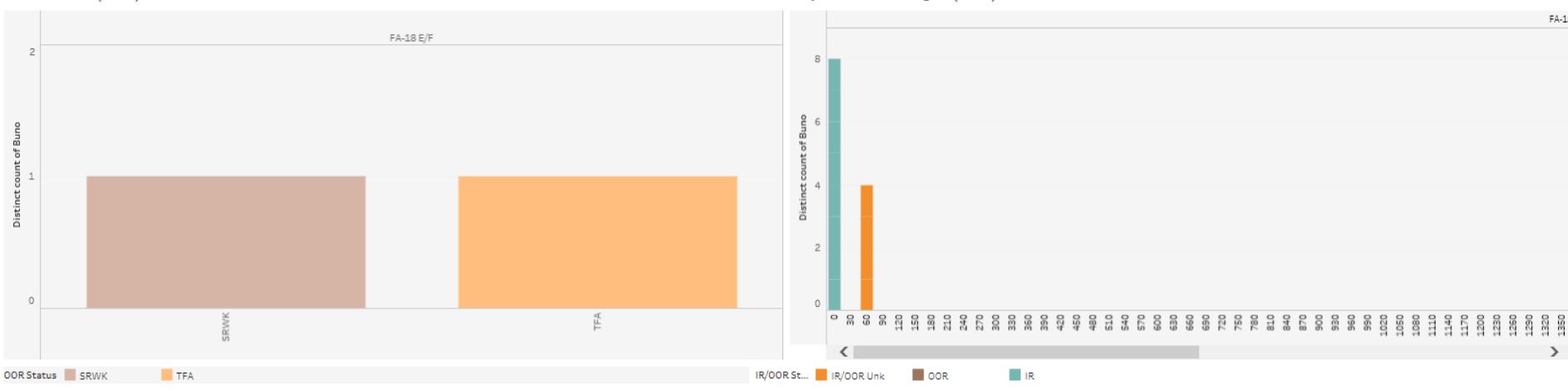
# Squadron Status

## Latest reported readiness for VFA-137 by BUNO



Selecting a specific box/BUNO filters to that aircraft

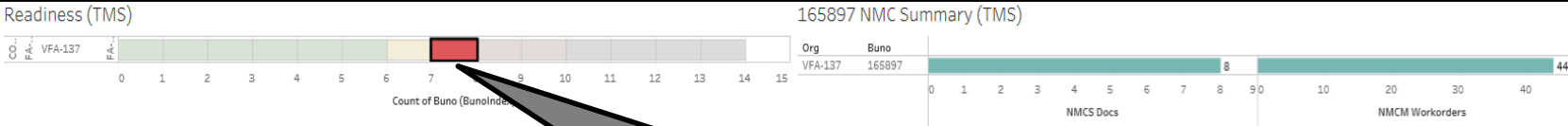
SELECT "SUPPLY / MAINT" FOR DETAILS



This view/image shows more detailed VFA-137 info. The Readiness status for each BUNO is shown in the upper left corner. The bottom right portion of this slide shows additional status data for each Buno and displays the number of days since flight for each Buno (starts green at zero days and shifts to red at >30 days). The bottom Left portion of this view (Open PSR Status) currently displays Depot PSR data (tracking depot level work and support) to display the total estimated cycle time using the actual aircraft induction date and the latest completion estimate as reported in PSR. This is for each BUNO in the selected squadron (VFA-137). We may change this pane to show the AMSRR/AIRRS OOR info vice PSR. We are moving the PSR data to a separate OOR Dashboard (Spelling Error! :- /). Clicking on BUNO 165897 filters this worksheet down to data for just that particular aircraft.

# Aircraft Status

Latest reported readiness status for BUNO 165897



CLICK ON BUNO AND SELECT "SUPPLY / MAINT" FOR DETAILS

Selecting a specific Buno will filter the dashboard to that aircraft

IR Status RBA NCMC NMCS OOR IR/OOR Unk

OOR Status (TMS)

Days since last flight (TMS)



OOR Status IR/OOR St... IR

This image shows what happens when a specific Buno is selected in the upper left pane. All of the charts in this view filter down to only info related to that Buno.

# Open Requisitions and Work Orders

Latest reported open work orders (DECKPLATE) & High Priority Supply (AMSRR) data for BUNO 165897

## Supply Detail

Buno (B..	NMC/PM..	Doc Number	Nomenclature & Niin (Combined)	Estimated De..	Remarks	
165897	NMC	7244GX39	015452670: GCU	9/30/17	JCRFI READY FOR ISSUE AWAITING RELEASE FROM PC	7R
		7254GX84	014938785: SMP	9/30/17	255DCODE FRC LEMOORE REPAIR AND RETURN	7R
		7254GX85	015226448: AHRS	9/30/17	254ERIOU AWAITING INDUCTION TO SUPPLY RECIEVED BY LSSN FRIEDA AT 7254/1440	7R
		7256GX04	012863516: PACKING	9/30/17	257JPKZ 722439177351 ARRIVED IN OAKLAND 7256 AT 2251	9B
		7256GX05	013033864: "BEARING,WASHER"	9/30/17	"257JPKZ UNABLE TO FIND TRACKING, INCOMING FROM WHIDBY ISLAND"	7R
		7256GX99	015431581: "TANK,FUEL,AIRCRAFT"	9/30/17	"257BGS DM NSN, UNIT OF ISSUE, OR PRICE OF REQUISITION HAS CHANGED ADDITIONAL STATUS WILL BE PROVIDED BY THE SUPPLY SOURCE TO I..	7R
		7257GX10	015637038: "PUMP, FUEL, JET"	9/30/17	257ERIOU TURN IN MADE TO LSSN FRED A 7257 AT 1200	7R
		7249GX67	014134476: RDP RADAR	9/21/17	250DCODE R AND R LEMOORE	7R

## Maint Detail

Buno1	TD Basic	Wuc Nomenclature & WUC (Combined)	System Reason	Sched/Uns..
165897		11CDR: EXHAUST NOZZLE CLOSEOUT ACS ..	Cannib consumable for 205	Unsched
		13C33: MLG AXLE ASSEMBLY	Cannib Stbd MLG AXLE > 20	Unsched
			FOM STBD ANTISKID TRANS	Unsched
		13CBC00: MLG OUTBOARD DOOR RH	Cann 5 FWD DR UPLK>215	Unsched
		13CC110: MLG WHEEL ASSY	STBD MLG TIRE (LEIVA)	Unsched
		13G1M: MOTION TRANSDUCER	ANTISKID HARNESS FRAY	Unsched
		13G1600: MLG WHEEL MULTIPLE DISK BR..	CANN STBD BRAKE>204	Unsched
		24A8F: APU CONTROL PANEL ASSEMBLY	INST APU PNL OP CHECK	Unsched
		27DC200: ENGINE FUEL CONTROL	PORT EHSV AWT LPT	Unsched
			STBD EHSV AWT LPT	Unsched
		27DF6: ENGINE FUEL PUMP	STBD ENG LEAK AWT LPT/HPT	Unsched
		42A1E00: GEU34/A AIRCRAFT ELECTRIC GENERATOR	CANN RH GCU>201	Unsched
			LH GENERATOR: AWT LPT	Unsched
		42W3210: SPECIAL PURPOSE CABLE ASSE..	OP CHECK NLG HARNESS	Unsched
		45B14: VARIABLE FLOW PUMP	HS2 HYD PUMP OIL LEAK	Unsched
		46D1200: NO. 4 FUSELAGE TANK (BLADD..	TANK 4 LEAK	Unsched
		46X2D00: 480 GAL AIRCRAFT FUEL TANK	FOM STA 6 D/T: AWT LPT	Unsched
		FFU-12/A	STA 6 D/T REMOVED	Unsched
		48B10: WINDSHIELD ANTI-ICE/RAIN REM..	ANTI-ICE AWT LPT	Unsched
		49D33: R/H FWD CKPT WRN ADVSY/THRE..	INST RH THRT ADV	Unsched
		57DA300: MX-11884/ASW-57(V) ATTITUD..	"AHRS ""A"" FAILURE"	Unsched
		62X3K00: RT1556 ( )/ARC 210 RADIO REC..	REINSTALL COMM1<105	Unsched
		73X51: ID-2582/A DISPLAY UNIT (MPCDR)	MPCD MUX FAIL	Unsched
		74B2100: CP2062( )/APG73 RDR DATA PR..	BAD RDP	Unsched
		74B2400: R2484/APG73 RADAR RECEIVER	CANN RDR REC>200 (OPCHK)	Unsched
		74P8300: CP-2536/AYK-22 ARMAMENT C..	Cannib SMP > 203	Unsched
		75E5B00: SUU-79 AIRCRAFT PYLON	FOM STA 3 SUU79	Unsched
			FOM STA 9 SUU79	Unsched
			INST STA 3 PYLON	Unsched
		75HA100: A/A49A-2 DBL ENDED LINKLES..	INST 20MM GUN	Unsched
		030:	HYD SAMPLE	Unsched
			R&C DD 21MAR17	Unsched
			R&C DD: 05SEP17	Unsched
		631T300: RT-1840(C) RECEIVER	FOM DMC	Unsched
		TRANSMITTER (LVT)	FOM EU	Unsched
			FOM UP EQP RACK	Unsched
		741V3: DIGITAL DISPLAY INDICATOR IP-1..	DDI JACK SCREW	Unsched
		7518M00: LAU127( )/A ACFT GUIDED MIS..	INST STA 11 LAU127	Unsched
		754CD00: BRU32( )/A ACFT BOMB EJECTO..	INST STA 3 BRU-32	Unsched
		767P0: AN/ALQ165(V)( ) COUNTERMEAS..	214 MOUNT TRAY BOLT STRIP	Unsched
		773J0: AN/AVH1 COCKPIT VIDEO RECORD..	EQUIPMENT RACK BOLTS	Unsched
		11000: AIRFRAME	BRKN ANCHOR NUT 18	Unsched

Selecting Buno 165897 will drill down to additional detail about those downing discrepancies. This includes document number, NIIN nomenclature, COG code, estimated delivery date, and any written remarks.

The right side of this view uses DECKPLATE data to provide detail on all open work orders for the selected BUNO. This includes whether or not the maintenance was scheduled or unscheduled.

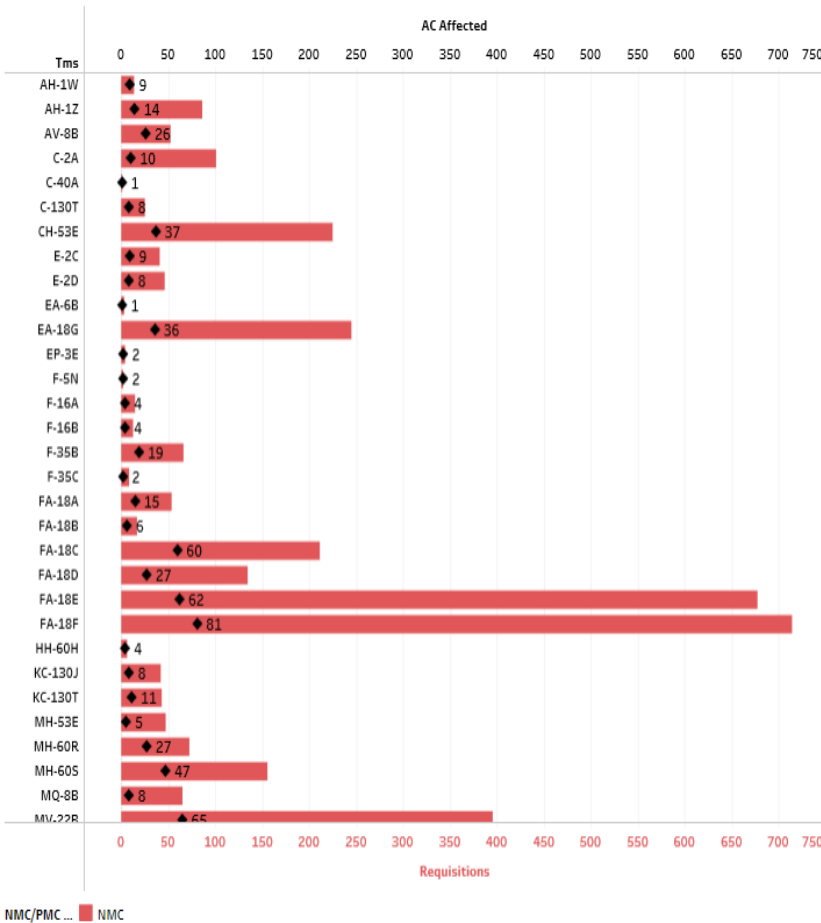


# Open Supply Requisitions (All TMS)

“You Cannot Fly Without SUPPLY” (as every GreenShirt Understands)

## Open Supply Documents on All Aircraft

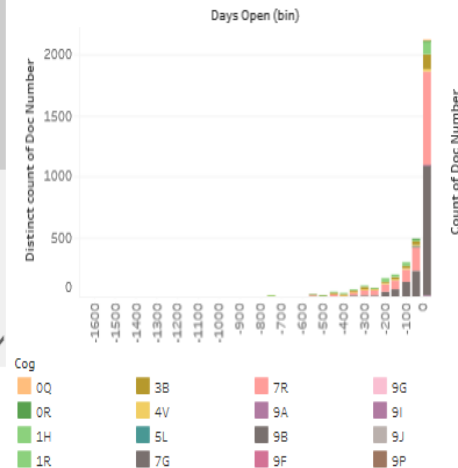
NMC Supply Impact



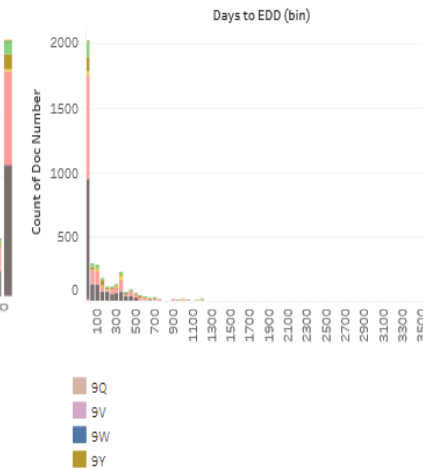
Supply Summary

Cog	NMC/PMC Status	Tms (BunoReportAllTecs)																		
		AH-1W	AH-1Z	AV-8B	CH-53E	E-2C	E-2D	EA-6B	EA-18G	EP-3E	F-5N	F-16A	F-16B	F-35B	F-35C	FA-18A	FA-18B	FA-18C	FA-18D	FA-18E
1R	NMC	2	4	8	1	2		20								2	7	2	70	
3B	NMC	4	2	22			5												60	
7R	NMC	1	31	14	79	21	22	2	143	2	1	9	5	40	8	17	4	74	29	280
9B	NMC	13	49	30	111	19	22	1	74	2	1	3	7	25	34	12	96	86	226	
0Q	NMC																			
0R	NMC																			1
1H	NMC																			
4V	NMC			2				3										9	2	39
7G	NMC												1							
9A	NMC																			
9F	NMC																			

NMC Aging Documents



NMC Days To EDD



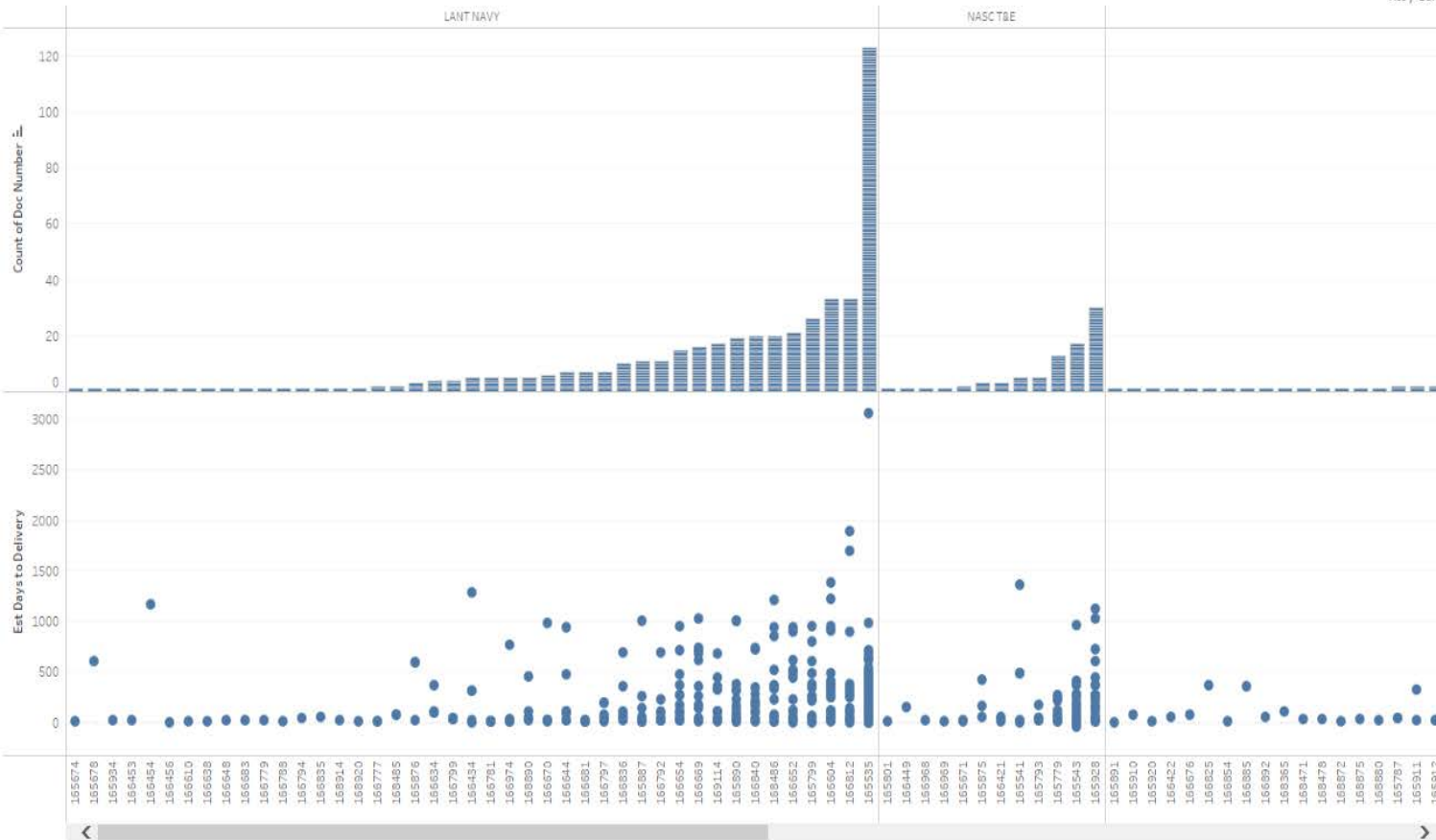
This dashboard shows all of the open supply requisitions open against each TMS (red bar), and how many aircraft are affected (black diamond). The top right quadrant breaks that down each requisition by cognizant code to show the distribution among consumables and repairables. The bottom right quadrant shows histograms depicting how long the documents have been open, as well as the estimated completion dates (EDD).

# Long Pole Analysis (RBA Opportunity)

## Number of Maintenance and Supply Documents, Showing Estimated Delivery Date

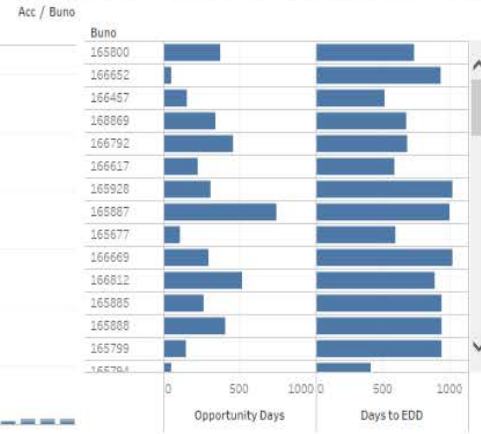
FA-18E & FA-18F Open HiPri NMC Supply

(By buno sorted by # open NMC supply docs)



### High Impact

Does Not Include Single Downers or Excessive (>1095 days) Delivery Timelines



### NMC Supply / Days to Del

9/15/2017 12:00:00 AM

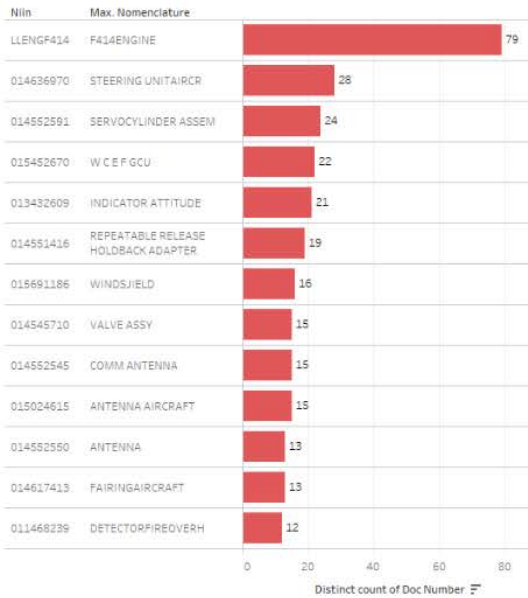
Buno	Nomenclature	Doc Number	Days to.	Delta D.
165535	ANTENNA	6217GR32	28	-325
		6245GR79	28	-325
		7018GA91	188	160
MOUNT	60260C40	3,056	2,346	
	7040GR32	327	67	
	7129GR94	27	-351	
VALVE ASSEMBLYA.	7111GR26	15	-140	
TUBE ASSEMBL	7133GR01	388	1	
	7133GR01G	212	-176	
	7135GR24	386	176	
LEVERCONTROL	7221GR16	385	314	
	7127GR94	377	-53	
RECEIVER-TRA	7242GR76	45	-77	
DISPLAY UNIT	5327GR01	174	-5	
FAIRING AIRCRAFT	6256GR39	155	136	

This dashboard shows the number of supply requisitions (top) and estimated delivery dates (bottom) for each BUNO. This allows the user to see the “long pole” requisition, which is the part with the longest EDD. This will show the user on which supply requisitions to focus. The number of opportunity days between the long pole and the next longest EDD is the number of RBA days that could be gained if the long pole EDD is brought to the left. The Opportunity Days metric is captured in the top right quadrants.

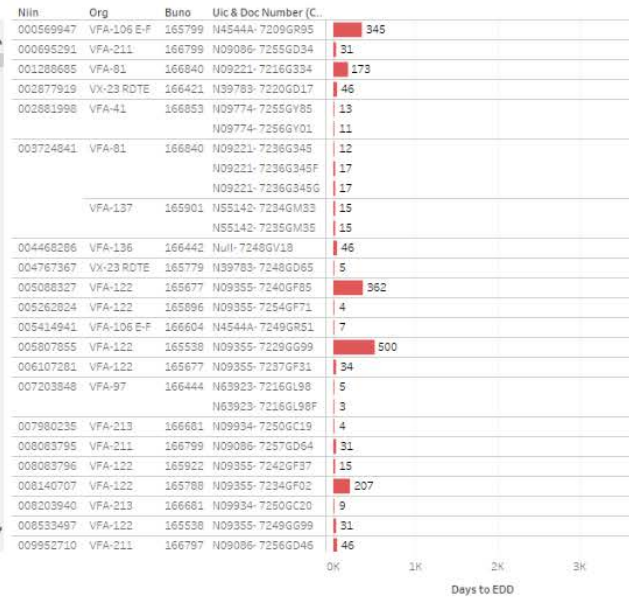
# Supply Requisitions by Count

Number of Maintenance and Supply Documents, Showing Estimated Delivery Date

AMSRR HiPri Open Reqs By NIIN



Open Supply Reqs Breakout (Days to Del)

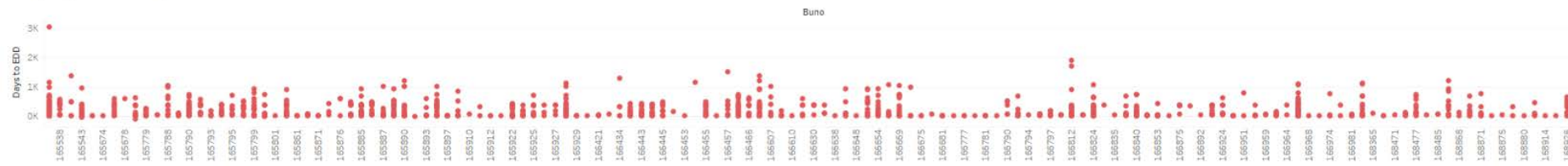


Open Supply Reqs Details



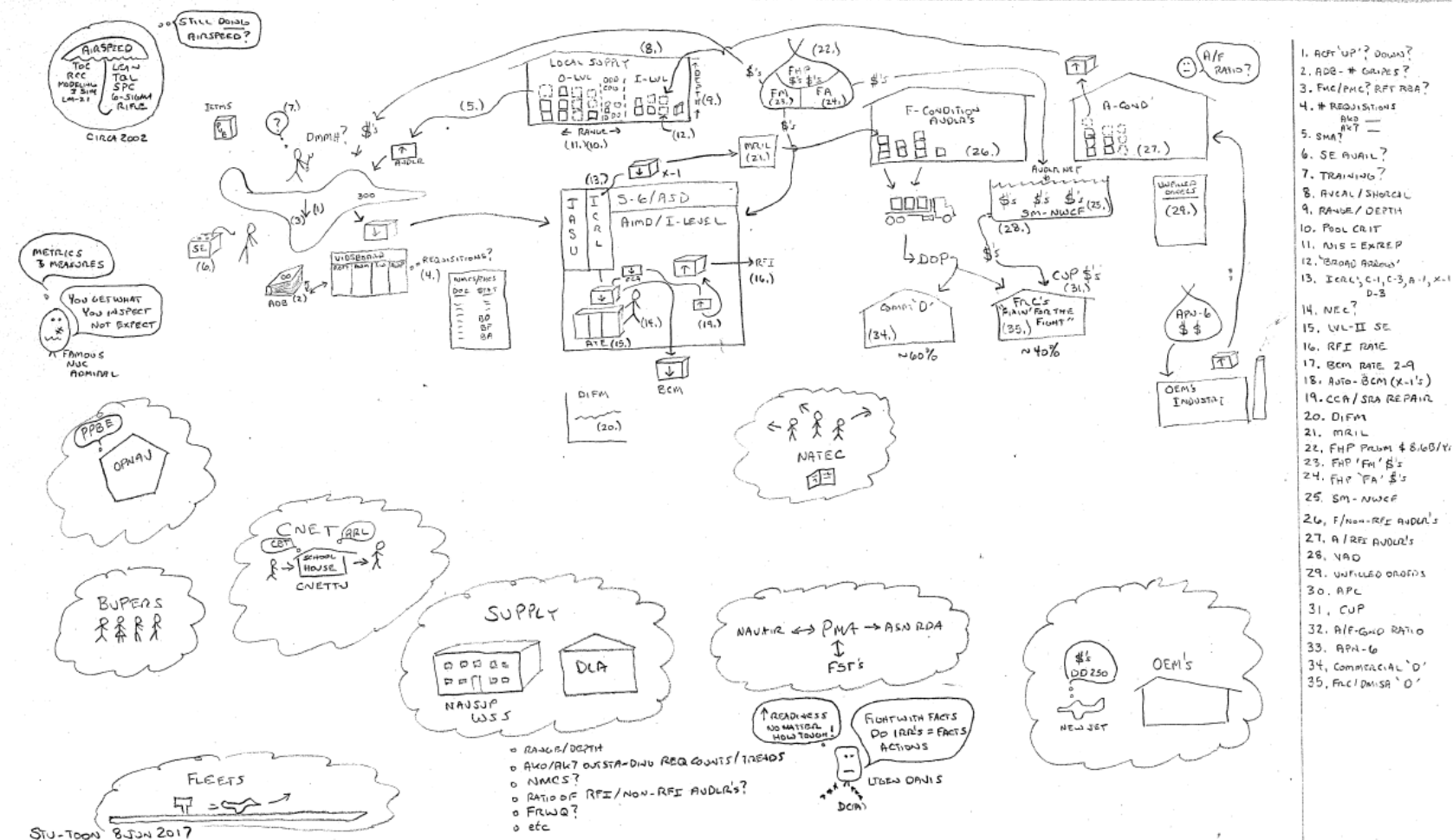
Filter sidebar with options for NIIN, Buno, Doc Number, and Calendar Date. Includes a legend for NMC/PMC Status with radio buttons for (All), NMC, PNC, and Other, and checkboxes for NMC and PMC.

Docs/Days to Delivery



This dashboard shows the number of supply requisitions by NIIN (top left), as well as the estimated delivery dates of each NIIN (by BUNO).

# At The End of the Day ? It Is All About Getting An AIRView of What Is Going On, Then Taking Action



**Comments? Questions? Discussion?**

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