The Detailing Process Information Technology and NEC Utilization
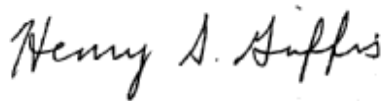
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The Detailing Process, Information Technology, and NEC Utilization

Bill H. Sims
September 2006

This annotated briefing focuses on the detailing process, information technology (IT), and implications for NEC utilization. It was completed as part of CNA's project on NEC utilization. The analysis involved in-depth interviews with Detailers and their supervisors as well as other players in the detailing process.

Outline

- Detailing process

- Support of NEC reuse by IT systems

- Near-real-time monitoring of NEC reuse

This document examines the Navy detailing process with an emphasis on whether the process encourages NEC utilization. We also examine IT systems used by Detailers to see if they support NEC utilization. Finally, we propose a means of near-real-time monitoring of NEC utilization and estimate NEC use and reuse within each Navy rating.

Detailing Process

The detailing process begins with the generation of a requisition for the billet and ends with a Sailor reporting for duty in that billet.

A properly functioning detailing process is essential to the Navy as a means of ensuring that each billet is filled with a qualified Sailor. A properly functioning detailing process also allows a Sailor to feel that his/her job preferences are being honored to the extent possible.

Detailers are the human face on the detailing process. They attempt to act as an honest broker, balancing the preferences and career progression of each Sailor with the needs of the Navy. Their efforts to be fair to all are encouraged by the realization that sometime soon another Detailer will be detailing them to a new job.

Requisitions

- Requisitions are generated for actual or projected rate/rating deficits at a given activity (UIC) within the 9-month detailing window

  - If there is no rate/rating deficit at the UIC, the requisition will not be generated, even though the activity may have a serious NEC deficit.

- NECs are then attached to requisitions based on NEC requirement deficiencies

- Often a command has more NEC shortages than body shortages

- A manning algorithm determines the most deficient NEC and puts it on the requisition

Requisitions are generated for actual or projected rate/rating deficits at a given activity (UIC) within the 9-month detailing window.

If there is no rate/rating deficit at the UIC, the requisition will not be generated, even though the activity may have a serious NEC deficit.

NECs are then attached to the requisitions based on a deficiency in that NEC as compared with the listed requirement.

It is often the case that a command has more NEC shortages than body shortages. In such a situation, a manning algorithm determines the most deficient NEC at that command and puts it on the requisition.

Notional Detailing Schedule[1]

- PRD-13: Sailor fills out preference sheet

- PRD-10: Sailor reviews preferences

- PRD-9: Sailor enters negotiation window

- PRD-5: Sailor assigned new job

- PRD-0: Sailor rotates to new job

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1. In months from Planned Rotation Date (PRD).

The notional detailing schedule is designed to assign a new job to Sailors well in advance of the incumbent "rolling."

The schedule is anchored to the Planned Rotation Date (PRD). At PRD-13 months, the Sailor is expected to fill out a preference sheet. At PRD-10 months, he or she is expected to review and update the list of preferred assignments. The Sailor enters the negotiation window at PRD-9 months. At PRD-5, the Sailor is assigned to a new job; at PRD-0, he or she rotates to the new job.
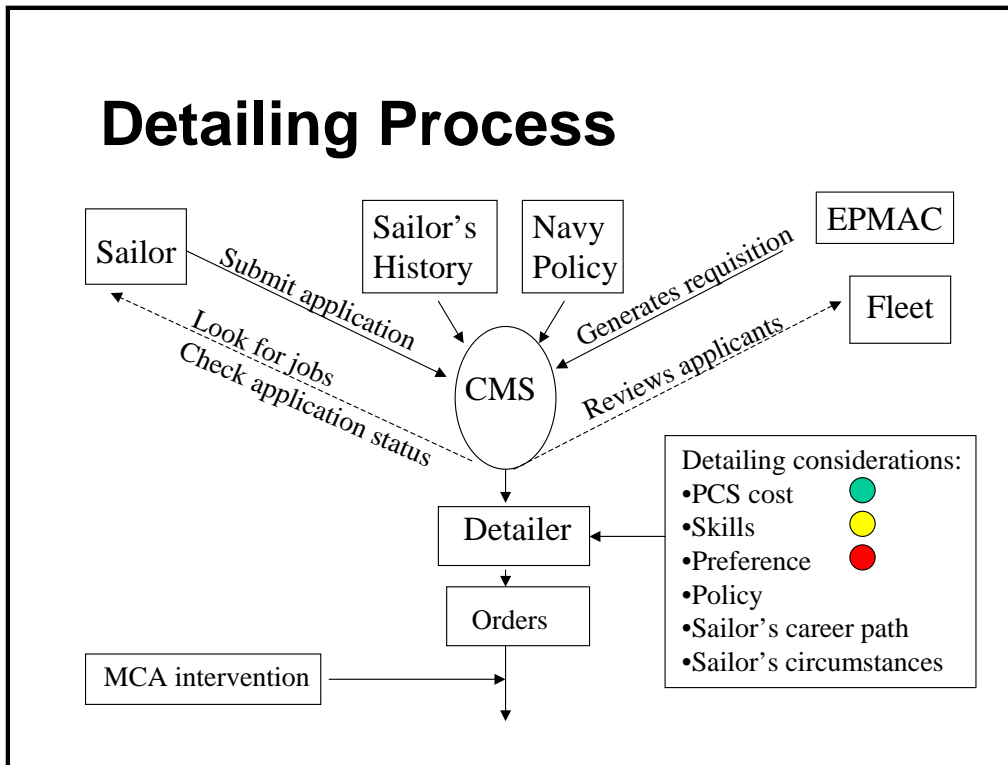
Detailing Process

This schematic illustrates important aspects of the detailing process. The Career Management System (CMS)[1] is the hub. The process is started by the Enlisted Personnel Manpower Analysis Center (EPMAC), which generates a requisition to fill an expected billet vacancy. The Sailor submits an application listing his/her preferences among listed vacancies. This information, along with the Sailor's history and Navy policy guidance, is incorporated into CMS. The Sailor can also use CMS to look for new job openings and to check on the status of his/her application. The fleet can use CMS to review qualifications of applicants for a vacancy. The Major Command Authority (MCA) reviews orders and intervenes in about 1 percent of cases.

The Detailer acts as an honest broker who attempts to meld the needs of the Navy and the needs of the Sailor.

The Detailer considers Permanent-Change-of-Station (PCS) cost, Sailor's skills, Sailor's job preference, Navy policy, Sailor's career path, and any special circumstances, such as a family member needing special care or a spouse who also serves in the military.

The first three of the considerations are highlighted by "indicator lights" that show how closely the assignment meets the requirements of both the Sailor and the Navy.

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1. CMS was formerly known as JCMS.

CMS Sailor Home Page

Home | Menu | Jobs | Results | Personnel | Preferences | User Profile | Help | Log Out

Sailor Home Page

Detailer Information
No detailer information located.

Navy's First Five Jobs

Select	S S	W A S	NEC1	NEC2	Rate	UIC	Activity Name	Location	Incentive	Job Code	Job Title	Type Duty	Pref Score	Moving Cost Score	Skills Score
Open Reqs - Jobs with a fill date from 6-9 months away.															
☐	4	*	0000	0000	AE3	65185	VFA 27	JAPAN, HONSHU YOKOSUKA		314403	AE - BASIC AVIATION ELECTRICIA	SEA	G	G	G
☐	2	*	0000	0000	AE3	63925	VFA 147	CA, LEMOORE	AIP	314403	AE - BASIC AVIATION ELECTRICIA	SEA	Y	Y	Y

First Five Jobs Matching Your Preferences

Select	S S	W A S	NEC1	NEC2	Rate	UIC	Activity Name	Location	Incentive	Job Code	Job Title	Type Duty	Pref Score	Moving Cost Score	Skills Score
Hot Jobs - Jobs with a fill date from now to 5 months away.															
☐	2	*	0000	0000	AE3	09604	VFA 115	CA, LEMOORE	AIP	314403	AE - BASIC AVIATION ELECTRICIA	SEA	Y	Y	Y
☐	2	*	0000	0000	AE3	09526	VAW 124	VA, NORFOLK		314403	AE - BASIC AVIATION ELECTRICIA	SEA	Y	G	Y
Open Reqs - Jobs with a fill date from 6-9 months away.															
☐	4	*	0000	0000	AE3	65185	VFA 27	JAPAN, HONSHU YOKOSUKA		314403	AE - BASIC AVIATION ELECTRICIA	SEA	G	G	G
☐	2	*	0000	0000	AE3	63925	VFA 147	CA, LEMOORE	AIP	314403	AE - BASIC AVIATION ELECTRICIA	SEA	Y	Y	Y

Incentivized Jobs

Select	S S	W A S	NEC1	NEC2	Rate	UIC	Activity Name	Location	Incentive	Job Code	Job Title	Type Duty	Pref Score	Moving Cost Score	Skills Score
Hot Jobs - Jobs with a fill date from now to 5 months away.															
☐	2	*	0000	0000	AE3	09604	VFA 115	CA, LEMOORE	AIP	314403	AE - BASIC AVIATION ELECTRICIA	SEA	Y	Y	Y
Open Reqs - Jobs with a fill date from 6-9 months away.															
☐	2	*	0000	0000	AE3	63925	VFA 147	CA, LEMOORE	AIP	314403	AE - BASIC AVIATION ELECTRICIA	SEA	Y	Y	Y

[Click on Status to proceed to application detail screen]

Your Current Job Applications

Pre	Pay Grade	Rate	Activity	Location	Status	CCC-ID	Det-ID	Max Bid	Sailor Bid	Hot Job	App Date
1	4	AE3	CFWP AIMD ATSUGI	JAPAN, HONSHU ATSUGI	A						2005-06-13
2	4	AE3	CV 63 KITTY HAWK	JAPAN, HONSHU YOKOSUKA	A						2005-06-13
3	4	AE3	VFA 27	JAPAN, HONSHU YOKOSUKA	A						2005-06-13
4	4	AE3	AIMD SIGONELLA	SICILY, SIGONELLA	A			$400.00	$350.00		2005-06-13

Your Job Applications For The Previous Cycle

No applications found for the previous cycle.

Proceed to compare selected requisitions or view requisitions plotted on 5vm

This slide shows the Sailor Home Page from CMS.

This page shows, among other items, the jobs for which the Sailor has applied, and the first five jobs that match the Sailor's preference at either the "yellow" or "green" indicator light level.

NEC1 and NEC2 represent the NECs that the job requires. In this example, the NECs are "0000," meaning that no NEC is required for the assignment.

Indicator Lights

- **PCS cost**
  - 🟢 **: Cost at or below baseline**
  - 🟡 **: Cost somewhat above baseline**
  - 🔴 **: Cost far above baseline**
- **Skills**
  - 🟢 **: Rank, rate, and NEC match requirements**
  - 🟡 **: Rank +1, NEC not match**
  - 🔴 **: Rank +2, Rate not match**
- **Preference**
  - 🟢 **: Close match**
  - 🟡 **: Somewhat close match**
  - 🔴 **: Not close**

CMS has a series of indicator lights that inform the detailing decision.

Probably the most important light is the PCS cost light. Green indicates that the expected PCS cost is at, or below, a baseline. Yellow means that it is somewhat above the baseline, and red means that it is far above the baseline.

The Skills light describes the degree of match between the Sailor's skills and those required by the prospective job. Green indicates a match by rank, rate, and NEC. Yellow indicates that rank is within +1 of target and/or NEC does not match. Red means that rank is within +2 of target and/or rate does not match.

The Preference light shows the degree of match between the Sailor's job preference and the prospective job. The match involves a complex weighting of type duty, activity code, platform type, command, and job title. Green indicates a close match, yellow a somewhat close match, and red a poor match.

Who Are the Customers and What Do They Want?

- Navy
  - Effective fleet
- Fleet
  - Skilled Sailors filling billets
- NPC
  - Low direct cost
  - Minimum complaints from fleet
- Sailor
  - Career-enhancing job
  - Good location
  - Accommodation of special family circumstances

The Detailer attempts to bring together the interests of a number of different customers.

The Navy wants an effective fleet. The fleet wants skilled Sailors filling all billets. The Navy Personnel Command (NPC) may reasonably want low direct cost of assignments and a minimum of complaints from the fleet.

For his or her part, the Sailor wants a career-enhancing job, a good location, and, if needed, the accommodation of special family circumstances.

Command Detailing Priorities

1. Same geographic location

2. NEC reuse

3. Global War on Terror (GWOT)

4. First overseas tour (i.e., push out)

5. Mission critical need

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Reference: SPDM 02-05.

Detailers are given priorities, which are listed in this slide.

The first priority is to assign Sailors to the same geographic location where they are currently located. This is presumably intended to minimize PCS cost.

Priority 2 is reuse of NECs. This also has the potential to reduce cost.

Priority 3 is support of the Global War on Terror.

Priority 4 is to push Sailors out on their first overseas tour.

Priority 5 is support of mission critical needs.

Detailers' Considerations in Making the Decision

- PCS cost—most important factor
- Career progression—also important
- Sea duty—all must share
- Homesteading—to be avoided
- Military husband and wife—keep at same location
- Special needs (child in hospital, autistic child, etc.)
- Retraining costs (vice PCS costs)—come into play only at end of process
- Indicator lights—inform but don't drive the decision

In interviews with Detailers, they mentioned several considerations that enter into the detailing decision:

1. PCS cost is the single most important item.

2. Career progression is a close second.

3. Make sure all share sea duty.

4. Watch out for homesteading.

5. Keep military husbands and wives at the same location.

6. Consider special needs, such as a child in the hospital or an autistic child.

7. Retraining costs, compared with PCS costs, are considered only at the end of the process.

8. Although indicator lights inform the decision, they don't drive it.

Support of NEC Reuse by IT Systems

This section examines the support of NEC reuse by various IT systems.

How Well Is the Detailing Process Working?

- We really don't know because there is no systematic monitoring of output measures
    - Nobody is monitoring NEC reuse
        - Exception is AM Detailers who keep a spreadsheet on reuse
    - Detailers believe they are doing a good job if the phone doesn't ring
    - Supervisors primarily look at meeting cost targets
    - Insiders (EPMAC) say that data are not adequate for monitoring the process
    - Some staff look at some output measures other than cost
        - MC Place and MC Lumley have done limited monitoring of indicator light distributions for applications (not assignments)

How well does the detailing process work? The reality is that we don't really know because there is no systematic monitoring of output measures.

No system is in place for monitoring NEC reuse. EPMAC is not doing it. Detailers generally don't. One exception that we found was the Detailers for the AM rating, who do keep a spreadsheet on each detailing that shows cost and whether they reused an NEC. The spreadsheets are maintained manually, and not all detailings may be recorded.

Detailers report feeling that they are doing a good job if the phone doesn't ring.

Supervisors primarily look at meeting cost targets.

EPMAC personnel claim that current data are not adequate for monitoring the process.

There is no systematic monitoring of Sailor satisfaction with the process. However, MC Place and MC Lumley have conducted limited monitoring of indicator light distributions for job applications (but not for job assignments).

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EPMAC Concerns[1]

- The requisition process, where the NECs requested are often not paygrade appropriate
    - EPMAC author suggests assigning NEC paygrade restrictions in accordance with fleet billet files vice school requirements
- The distribution process, where only 65 percent of primary DNEC actions matched the primary NEC on the requisition
    - EPMAC author suggests better Detailer training and monitoring
- We think that these concerns need to be addressed but should not preclude the need to monitor what can be monitored now

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1. EPMAC point paper, LCDR J. M. Fox, 5 March 2002.

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In 2001, during a visit to Japan, CNP was told that Sailors often reported to Forward Deployed Naval Force (FDNF) commands without the required NEC or en route training. In 2002, EPMAC conducted an in-depth review of NEC distribution processes to determine how significant the qualification mismatch was and to support formulation of possible means to improve the situation. EPMAC concluded that the question could not be answered due to assignment and distribution business processes that make the data inaccurate. They identified the following problems:

• The requisition process—where the NECs requested are often not paygrade appropriate

> EPMAC suggested assignment of NEC paygrade restrictions in accordance with fleet billet files vice school requirements.

• The distribution process—where only 65 percent of primary NEC actions matched the primary NEC on the requisition

> EPMAC suggested better Detailer training and monitoring.

In recent interviews, EPMAC personnel indicated that they do not think that the situation has improved.

We believe that these issues should be addressed, and results monitored, but that the need to make the data better should not negate the need to monitor what can be monitored now.

What Is Missing?

- A systematic way for PERS-40 to know how well the detailing is meeting the needs of its varied customer base

    – The necessary information should be:

        • Simple

        • In near real time (results)

        • Comprehensive

            – Detailing necessarily involves tradeoffs

            – NECs should not be examined in isolation

        • Available to both Detailers and supervisors

What is missing? Based on our observations of the detailing process and those of EPMAC, we believe that there is a need for a systematic way for PERS-40 to know how well the detailing is meeting the needs of its varied customer base.

The necessary information should be simple, and the results should be in near real time. In addition, the information needs to be comprehensive because detailing involves tradeoffs; NECs should not be examined in isolation. Finally, the information about how well the detailing is meeting the needs of its customers should be available to both Detailers and supervisors.

Suggested Approach

- Short term
    - Routinely monitor EAIS page D-16 or EMF
    - Monitor JCMS output, if possible
- Long term
    - Build comprehensive monitoring capability into future spirals of JCMS
    - Assignment control authorities should monitor the ARIS I file to look for NEC vacancies that are not being addressed through the requisition process

In the short term, we make two suggestions: (1) conduct routine (i.e., monthly) monitoring of EAIS page D-16 data or the Enlisted Master File (EMF) and (2) monitor JCMS output to the extent possible. At this time, it is not clear what is possible here.

In the longer term, we suggest the following:

- Build comprehensive monitoring capability into future spirals of JCMS that, among other things, complements the SeaWarrior concept of tracking and assigning Sailors by skills and other associated attributes.

- Assignment control authorities should monitor the ARIS I file to look for NEC vacancies that are not being addressed through the requisition process. It may be a small problem that can safely be ignored, or it may not. In any event, it should be examined.

Other Concerns

- Only one requisitioned NEC is reported in JCMS (two are needed about 7 percent of the time)
- Requisitions for component NECs may not trigger fill with associated primary NEC
    - Detailers say they can handle this, but it would need to be dealt with if detailing is ever downsized or automated
- Replacing a single NEC by numerous Human Capital Objects has the potential to add complexity—not a good thing, in general
- Complexity should not surpass Detailers' understanding
- Consider how complexity would affect the ability of NPC to conduct detailing in the event of a system failure, such as in the aftermath of Hurricane Katrina.

This slide lists concerns that we note but have not fully researched.

JCMS sees only one NEC as requisitioned, although many jobs require two. An example is organizational level maintenance in the aviation community. Equipment-associated NECs are required—as well as aircraft type.

There is concern that requisitions for component NECs may not trigger fill with an associated primary NEC. Detailers say that they can handle this because of their experience; however, if the Detailer's job should ever be downsized, automated, or civilianized, this would be a concern.

Replacing a single NEC by numerous Human Capital Objects has the potential for increasing complexity, which is usually not a good thing. It will be a challenge to deliver the necessary detail without overwhelming the Detailers. Consideration should also be given to how detailing might be done if the CMS system went down, as it did for about two months in the aftermath of Hurricane Katrina.

Monitoring NEC Utilization Using Current IT System

- The current IT system does not directly support tracking and optimization of NEC utilization

- However, data are available in the current system, which could allow users to track NEC utilization on a near-real-time basis and make interventions as needed

Based on numerous interviews with Detailers and EPMAC personnel, we conclude that the current IT system does not directly support tracking and optimization of NEC reuse.

However, data exist on the current systems that could allow users to track NEC reuse on a current basis and make interventions as needed.

Near-Real-Time Monitoring of NEC Reuse

An example follows of monitoring that could be done with existing data.

Monitoring NEC Utilization

- At the end of the detailing process, an entry is made in the EAIS that migrates to the Enlisted Master File

  – We focused on these "volatile" data that are retained only until a member reports to the new duty station. This allows us to monitor in <u>near real time</u>, rather than wait until all members whose orders were written in a year arrive at their new duty station.

  – The essential data are in the Basic Orders and Ultimate Prospective Gain Activity sections of EMF or in EAIS page D-16.

At the conclusion of the detailing process, an entry is made in the Enlisted Assignment Information System (EAIS). This entry describes the detailing and codes indicating whether a member was able to make use of an NEC that he/she holds in inventory. The data also include cost information about moving to the new assignment.

In subsequent slides, we will give an example of how these data could be analyzed to yield timely information on NEC reuse and on the cost of reassignment.

Since this is our first look at the data, we will go into more detail in the analysis than would be necessary for someone monitoring the situation on a monthly or quarterly basis.

The essential data are in the Basic Orders and Ultimate Prospective Gain Activity sections of EMF or in EAIS page D-16.

Data

- The data set consists of all orders written during CY 2005. Removing duplicate records from 12 end-of-month EMF snapshots yielded 120,371 cases.

- We emphasize that this is a cross-sectional data set covering orders generated in one year.

- This is in contrast to the more typical longitudinal analysis that might cover orders written over many years

The data set consists of all orders written during CY 2005. We assembled the data from 12 end-of-month EMF snapshots and removed duplicate records, resulting in 120,371 cases.

Assembling this full-year data set was fairly difficult. We explain later how to obtain a data set that is almost as good—and much easier to get.

We emphasize that this is a cross-sectional data set covering orders generated in one year. It will enable us to know what percentage of orders that year involved NEC utilization and reuse.

This is in contrast to the more typical longitudinal analysis that might cover many years and would enable us to describe what percentage of NECs earned are ever reused during the Sailor's entire career. The development of a longitudinal data set is much more difficult.

Number of Orders by Month Generated

Month orders generated (2005)
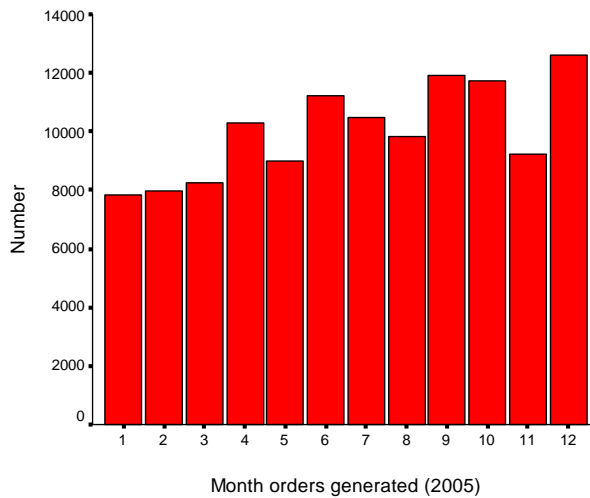
This slide shows the number of orders generated by month during CY 2005.

As mentioned earlier, the raw data contained much duplication because the data included orders for each Sailor from the time of generation until he/she arrived at the new permanent duty station. During the merge process, we retained only the most recent record of orders. As a result, orders initially written early in the year and subsequently modified are shifted to appear in a later month. This contributes somewhat to the apparent increase in orders written in the later months, but there still seems to be a real underlying trend toward more orders later in the year.

In any event, we see an average of about 10,000 orders written per month.

Data Reduction[1]

- We want to examine orders that require a "real" NEC

- The 120,371-case data set was reduced by removing cases representing assignments that do not require an NEC and cases lacking complete information

- 120,371 orders generated in 2005, less

  -20,358 orders with blank UPGDNRC1, less

  <u>-46,679</u> orders with blank or 0000 UPGDNEC1, leaves

 53,334 orders suitable for analysis

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1. Our initial investigations were carried out on a small data set supplied by the AM Detailers and a larger set supplied by PERS-45. All results were consistent.

We want to examine orders that require a "real" NEC. By that we mean an NEC gained by coursework or one that can be awarded as a result of on-the-job training (OJT). Hence, the 120,371-case data set was reduced by removing cases representing assignments that do not require an NEC and cases lacking complete information.

We removed 20,358 cases with blank UPGDNRC1 and 46,679 cases with blank or "0000" UPGDNEC1, leaving 53,334 cases suitable for analysis. This is the selected sample that we will use throughout the analysis.

We note that this procedure removes many cases with DNRC position 4 codes of "A," which denotes NECs held in inventory. Although these cases are coded as NEC held in inventory, it is somewhat misleading. They do not represent real NECs; they simply mean that the job requires no NEC. Therefore, if the Sailor has no NEC, that is fine.

Number of Orders by Month Generated for Selected Sample[1]

Month orders generated (2005)

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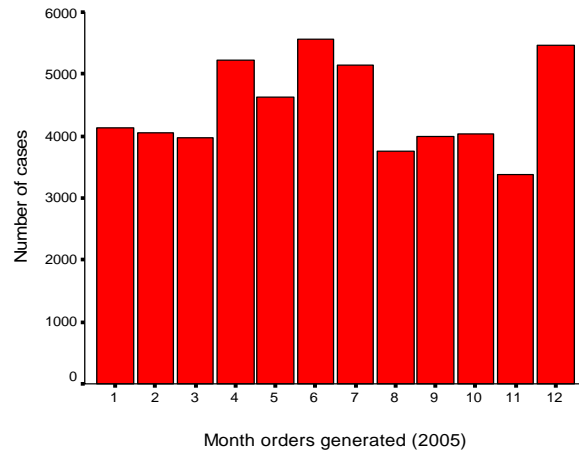
1. Selected sample of 53,334 cases.

This slide shows the number of orders generated per month in the selected sample—that is, about 4,000 cases per month.

Data Elements Used

Basic Orders (BO) PCS Cost	Rank
BO Per Diem Cost 1	Rate
BO Per Diem Cost 2	Paygrade
BO Generate Transmission Date	NEC1-5
Ultimate Prospective Gain (UPG) Activity Estimated Date of Arrival (EDA)	NEC1-5 Dates
Availability Expected NEC	UPG DNRC1
1st Temporary Prospective Gain (TPG1) Expected NEC	UPG DNRC2
2nd Temporary Prospective Gain (TPG2) Expected NEC	UPG DNEC1
3rd Temporary Prospective Gain (TPG3) Expected NEC	UPG DNEC2

This chart shows the data elements available on our file. Other data elements were available and could have been added if desired.

Paygrade Distribution of the Data[1]

Number of cases

16000

14000

12000

10000

8000

6000

4000

2000

0

1   2   3   4   5   6   7   8   9
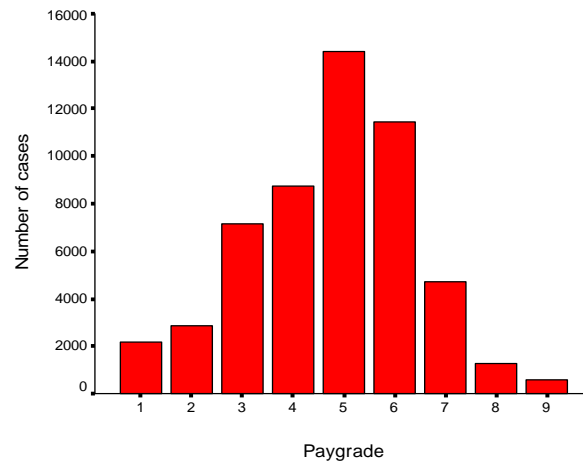
Paygrade

_____
1. Selected sample of 53,334 cases.

This slide shows a distribution in paygrade for the sample. The largest number of members are in paygrade E5. Very few cases are shown for lower grades, as would be expected, since we have restricted the sample to those assigned to jobs requiring a "real" NEC.

You Can Monitor Costs[1] of Orders by Month

Month orders generated (2005)

Average cost $4,865

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1. Costs as seen by NPC (i.e., PCS + TDI costs).

This slide shows costs as seen by NPC by the month the order was written. The average cost is $4,865, which includes PCS and Temporary Duty In route (TDI) costs.

Distribution of DNRC Position 4 Codes

DNRC (4)	NEC utilization category based on DNRC				
	Utilized NEC	Got training	Untrained	Misc.	Total
A[a]	20998				20998
B, C, D, J, K, Z		23134			23134
L, M, Q, R, T, U			1498		1498
E, F, G, H, N, O, P, S, W,[b] Y				7704	7704
Total	20998	23134	1498	7704	53334

a. Less 2,660 cases with DNRC 0053 (SELRES to Active Duty—no NEC required).
b. 2,660 cases with DNRC 0053 added to this code.

There are 26 Distribution NEC Reason Codes (DNRC)—one for each letter of the alphabet. For analysis, we have grouped them as follows:

1. Utilized an NEC in inventory

2. Getting Training for the NEC

3. Needs training for the NEC, but is apparently not getting it

4. Miscellaneous (mostly, but not exclusively, assignments for which no NEC is required).

This slide shows how we have classified the 26 reason codes into the four large categories.

DNRC (4) Code A Usable as a Measure of NEC Utilization But Needs Work

Reuse flag from DNRC(4)	Reuse based on confirmatory data in EMF			Total
	NEC in inventory	Training for NEC	No training or inventory confirmation	
NEC in inventory	15751 (75%)	1206 (6%)	4041 (19%)	20998 (100%)
Training for NEC	4251 (18%)	15887 (69%)	2996 (13%)	23134 (100%)
Misc.	1281	168	7753	9202
Total	21283	17261	14790	53334

In this slide, we address the question of whether we can trust the DNRCs to identify NEC reuse.

This cross-tabulation breaks the data vertically—by category defined by DNRCs—and horizontally—by categories based on confirmatory data in EMF. Ideally, both categories should agree, but the sources agree on only 15, 751 cases (i.e., about 75 percent of the time).

In about 25 percent of the cases, orders are coded as having the DNEC in inventory, yet no confirmation can be found in EMF that the Sailor has the NEC in inventory or is even in training for it. This appears to be, in part, due to Detailers entering a DNRC of "A" when they should have used "S" for substitutable NEC.

In another 25 percent of the cases, orders are coded as not having the NEC in inventory when the EMF indicates that the Sailor actually has the NEC in inventory. This group is probably not as much of a problem as it might seem because it can be understood in terms of delays in recording NECs that were recently received in training.

In our view, the only practical way to monitor NEC reuse in the short term is to use the existing DNRC data that are entered by Detailers. We note that the number of NEC utilizations (21,283 versus 20,998) is of no practical significance. Detailers should be urged (and trained) to use DNRCs properly.

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**Percentage of Orders by Category**
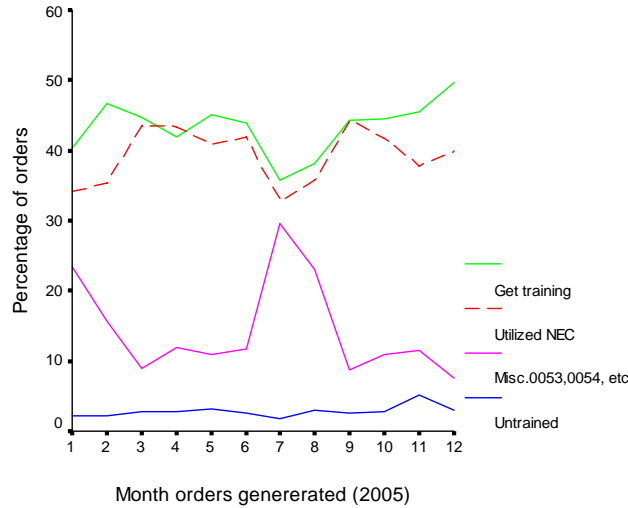
This slide shows the percentage of orders that fall into the four large categories of DNRC codes by the month the orders were generated.

The top line (green) shows those orders that included training, and the broken line (red) shows those in which the Sailor was able to use an NEC from inventory. Both lines are rather stable over the year. The percentage of orders using an NEC from inventory for the year was about 39 percent.

The third line (pink) shows orders that fall into the miscellaneous category. This category peaked in July and August due a surge in orders using special accounting codes, such as 0054 (pregnancy) and 0053 (SELRES to active duty). Neither of these assignments requires an NEC.

The bottom line (blue) shows those orders that need NEC training but appear to not be getting it. This group represented about 3 percent of the total but increased to about 6 percent in November 2005.

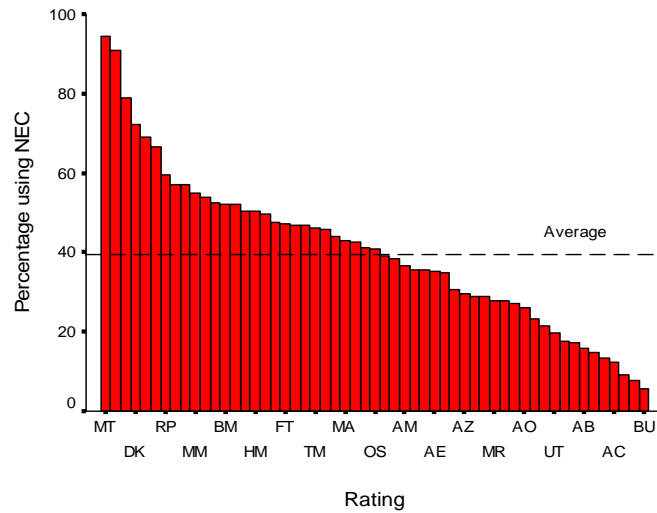**Percentage Using NEC From Inventory Varies Greatly by Paygrade**
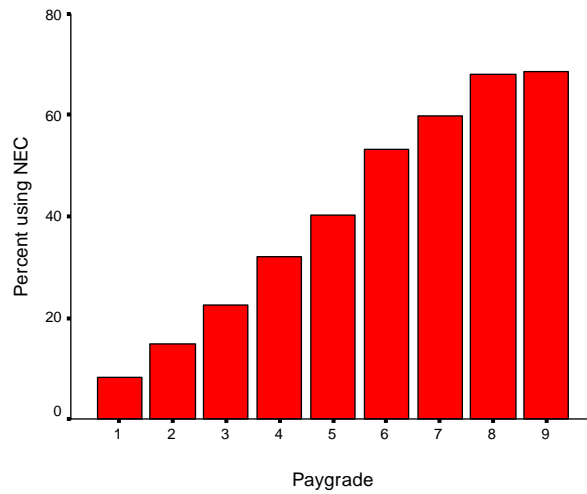
This slide shows the NEC reuse rate by paygrade.

As we would expect, the NEC reuse rate is very small for the lower paygrades and increases to near 70 percent for grades E8 and E9.

Clearly, the Navy is successfully reusing a great deal of the knowledge and experience resident in its career Sailors.

31

Percentage Using an NEC From Inventory by Rating

This chart shows the percentage using an NEC from inventory by rating. All ratings are shown, but only a few can be identified on this chart. Clearly, NEC reuse varies greatly by rating.

The average reuse rate is 39 percent. In subsequent slides, we will break the data into approximately equal thirds to allow the display of more detail.

Percentages for junior ratings (SR, SA, SN, etc.) and for very low population ratings (LI, LN, JO, PC, etc.) are not shown.

**Percentage Using an NEC From Inventory by Rating (Upper Third)**
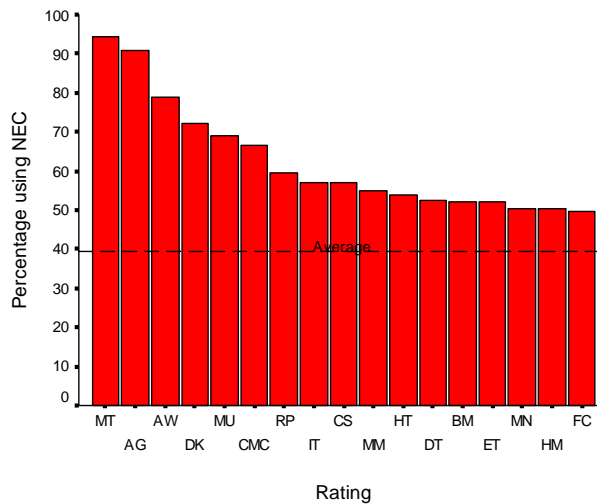
This slide shows NEC reuse for the top third of ratings. In each rating, the NEC reuse rate exceeds the overall average of 39 percent—in most cases, by a wide margin.

These ratings with high NEC utilization include Missile Technician (MT), Aerographer's Mate (AO), Aviation Antisubmarine Warfare Operator (AW), Disbursing Clerk (DK), Musician (MU), Command Master Chief (CMC),[1] Religious Program Specialist (RP), Information Systems Technician (IT), Culinary Specialist (CS), Machinist's Mate (MM), Hull Maintenance Technician (HT), Dental Technician (DT), Boatswain's Mate (BM), Electronics Technician (ET), Mineman (MN), Hospital Corpsman (HM), and Fire Controlman (FC).

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1. We combined the ratings of CMDCM, CNOCM, and FLTCM into one we call CMC.

Percentage Using an NEC From Inventory by Rating (Middle Third)
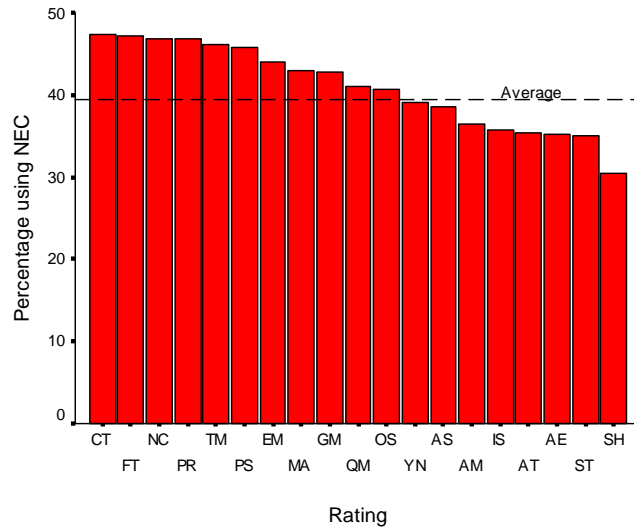
This slide shows ratings in the middle third.

These ratings include Cryptologic Technician (CT), Fire Control Technician (FT), Navy Counselor (NC), Aircrew Survival Equipment (PR), Torpedoman's Mate (TM), Personnel Specialist (PS), Electrician's Mate (EM), Master-at-Arms (MA), Gunner's Mate (GM), Quartermaster (QM), Operations Specialist (OS), Yeoman (YN), Aviation Support Equipment (AS), Aviation Structural Mechanic (AM), Intelligence Specialist (IS), Aviation Electronics Technician (AT), Aviation Electrician's Mate (AE), Sonar Technician (ST), and Ship Serviceman (SH).

Percentage Using NEC From Inventory by Rating (Lower Third)
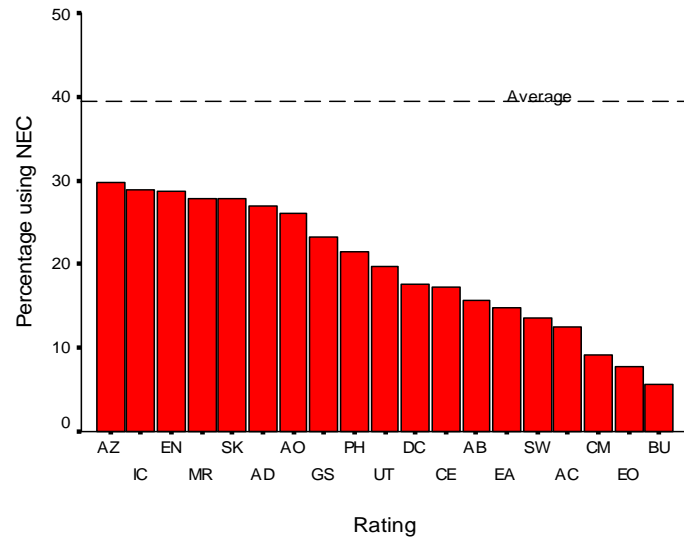
This slide shows ratings in the lower third. All are far below average.

These ratings include Aviation Maintenance Administration (AZ), Interior Communications Technician (IC), Engineman (EN), Machinery Repair (MR), Storekeeper (SK), Aviation Machinist's Mate (AD), Aviation Ordnanceman (AO), Gas Turbine Systems Technician (GS), Photographer's Mate (PH), Utilitiesman (UT), Damage Control (DC), Construction Electrician (CE), Aviation Boatswain's Mate (AB), Engineering Aide (EA), Steelworker (SW), Air Traffic Controller (AC), Construction Mechanic (CM), Equipment Operator (EO), and Builder (BU).

Percentage Using an NEC From Inventory by Numeric NEC Groupings
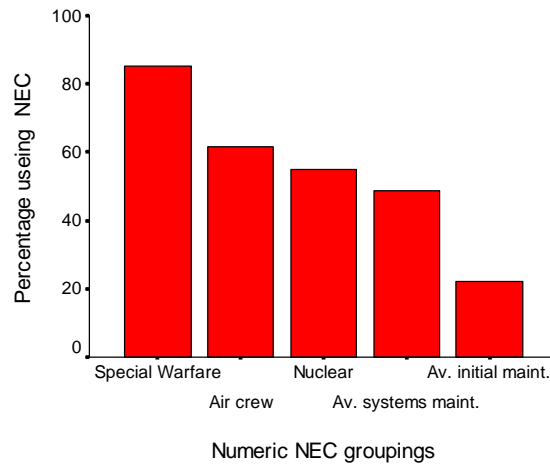
Some numeric NECs are often collected into functional groups. The percentage using their NEC is shown for those groups in this slide. The Special Warfare grouping has the highest use rate at about 82 percent. The Aviation Initial Maintenance grouping has the lowest level—about 20 percent.

**Percentage of Orders That Apparently Need, But Are Not Getting, Training**
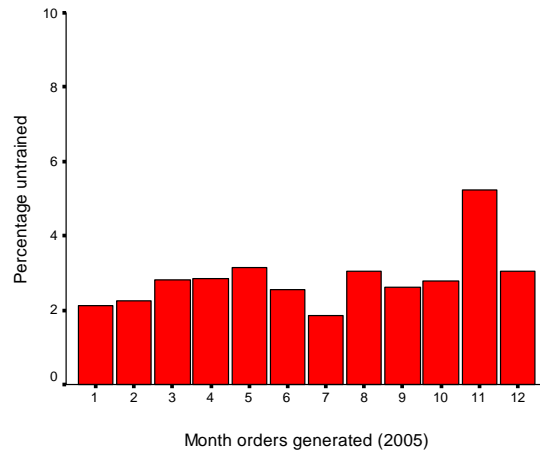
This chart highlights a small but important group of Sailors. It shows the percentage by month of Sailors needing but not getting training. When these Sailors show up at their receiving command, they will not be the "full-up round" that the command expects. Although the overall percentage is only 2 to 3 percent, the effect is concentrated in some ratings, as shown on the next slide.

Ratings With Largest Percentages of Orders That Need, But Are Not Getting, Training

Rating	Description	Percentage untrained
SH	Ship Serviceman	27.3
SK	Storekeeper	15.2
EN	Engineman	13.0
AC	Air Traffic Controller	10.5
AD	Av. Machinist's Mate	8.5
AO	Av. Ordnanceman	8.4
CS	Culinary Specialist	7.6
GS	Gas Turbine Sup. Tech.	6.9
EM	Electrician's Mate	5.5
CT	Crypto. Tech.	4.1

This slide shows the ratings with the largest percentage of Sailors in need of, but not getting, training. More than 10 percent of Sailors assigned to the Ship Serviceman, Storekeeper, Engineman, and Air Traffic Controller ratings apparently do not have the specified training. Perhaps they will be sent to school after they arrive at the receiving command; perhaps they will not. In any event, they are not the full-up round that the receiving command rightfully expects.

What Percentage of NEC Utilization From Inventory is Reuse vs. Initial Use?
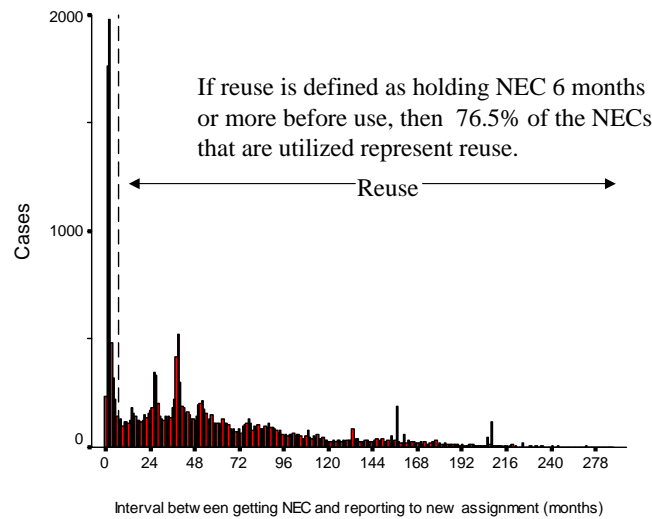
This slide shows the interval between the award date for an NEC and the use of the NEC. It appears that there is a spike in NEC use during the 5 months after award. We consider this spike to be initial use of the NEC. We consider all intervals of 6 months and longer to be reuse. Although 6 months is somewhat arbitrary, it appears to be a reasonable break point.

Regression Analysis[1] of Total Cost of New Assignment

Model	R	r^2	Change in r^2	Significance
Paygrade	.409	.167	.167	.000
Paygrade and rating	.443	.196	.029	.000
Paygrade, rating, and NEC reuse[2, 3]	.449	.201	.005	.000

_____

1. PCS + TDI per diem = F (paygrade, rating, and NEC utilization).
2. Reuse is defined as holding NEC 6 months or more before getting new assignment.
3. Regression coefficient indicates that reuse saves $918 per set of orders.

Considering reuse to be those holding an NEC for 6 months or longer, we carried out a regression analysis to estimate the effect of reuse on total cost (to NPC) of the assignment.

This slide summarizes our regression analysis of total cost (PCS and TDI) for the new assignment. The equation we estimated follows:

Cost = F (paygrade, rating, and NEC reuse)

The summary indicates that all variables were statistically significant, but only paygrade and rating have a major impact on the explained variance. Note that the effect of NEC reuse explains only 0.5 percent of the observed variance. However, even this small amount is measurable; it amounts to a saving of $918 per order for those who reuse an NEC.

Clearly, a major factor in cost is the distance between the old and new duty station. That cost was not included in our equation—hence the rather low percentage of total variance explained. However, that omission is not expected to significantly affect the accuracy of the cost effects attributable to paygrade, rating, or NEC reuse.

Total Cost[1] by Paygrade by NEC Reuse
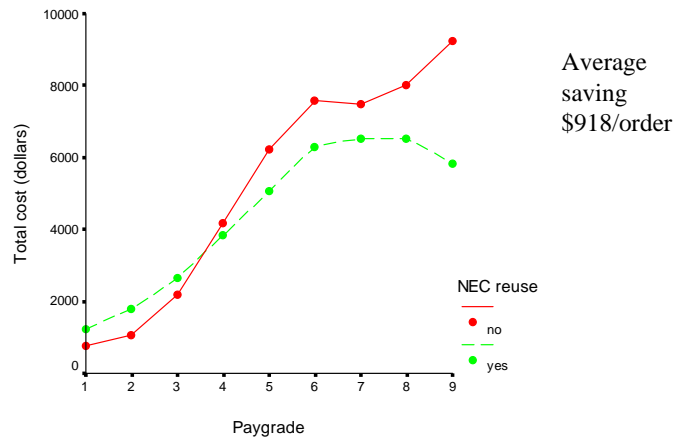
1. Costs as seen by NPC (i.e., PCS + TDI costs).

This chart illustrates the total cost (PCS + TDI per diem) to NPC. Reuse is estimated to save about $918 per set of orders. It appears that the savings only start to become realized at paygrades E4 and above.

Although we denote this as "total" cost, the term is somewhat misleading. It does not include the considerable cost of the schoolhouse and instructors. It also does not include the "opportunity cost" of a member spending time retraining vice performing productive work for the Navy. If these additional costs were included, the estimated savings to the Navy from NEC reuse would be much larger and the rationale for NEC reuse stronger.

Estimating Current-Year NEC Reuse

- Estimated current-year NEC reuse =

    – Percentage of current-year assignments requiring NEC that use NECs from inventory, multiplied by

    – Fraction of current-year assignments from inventory that held the NEC 6 months or more before arriving at new assignment

- Estimate = (39.4%) x (0.765)= 30.1%

We can also use our definition of reuse to estimate the percentage of NECs that were reused vice simply used.

The estimate is the percentage of current-year assignments requiring an NEC that use an NEC from inventory, multiplied by the fraction of current-year assignments from inventory that held the NEC for 6 months or longer before arriving at the new assignment.

The result is (39.4 percent) x (.765) = 30.1 percent as our estimate of NEC reuse during CY 2005. Recall that this is a cross-sectional estimate for one year. An estimate from a longitudinal analysis covering a Sailor's entire career might yield a different reuse estimate.

Hard vs. Easy Way of Doing This

- Hard way
  - What was just presented
  - Build database from 12 end-of-month snapshots from EAIS or EMF
  - Merge the files to keep the most recent "duplicate" record
- Easy way
  - Use most recent end-of-month snapshot
  - Results are almost as good and certainly good enough

As mentioned at the outset, there are two ways to do the cross-sectional analysis—the hard way and the easy way.

We have just described the hard way. It involves building a database from 12 end-of-month snapshots from EAIS or EMF. Then the files must be carefully merged to delete all "duplicate" records (keeping only the most recent record). This results in the best possible cross-sectional data set.

The easy way is to use only the most recent monthly snapshot. It may seem strange that 1 month of data is almost as good as 12 months' worth. However, recall that these records—although volatile—stay on the file until the Sailor arrives at the new duty station. Because many Sailors don't report to the new duty station for many months, they appear on the current snapshot file even though their orders were generated months ago. This gives us enough data to see back in time from a single current snapshot. The resulting data are almost as good as the full-year data and certainly good enough for this type of analysis.

Comparison of Data Sets (Full-Year vs. December Snapshot)
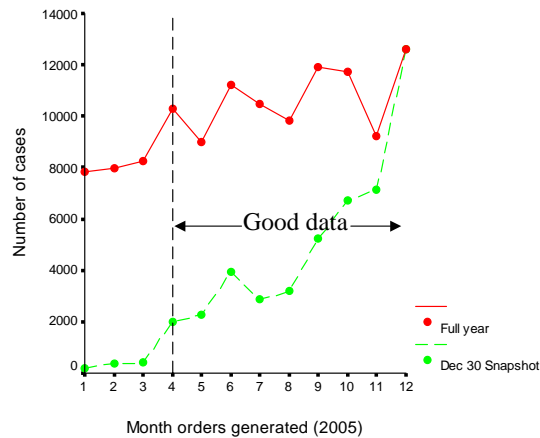
This slide shows the number of cases by month in which the orders were generated from the full-year data set and from the December 30 snapshot. Although the number of cases in the snapshot fall off, there are still about 2,000 cases per month back through the fourth month (April). This gives us nine months of good visibility in the rear-view mirror.

Comparison of NEC Utilization Rates (Full-Year Data vs. December Snapshot)
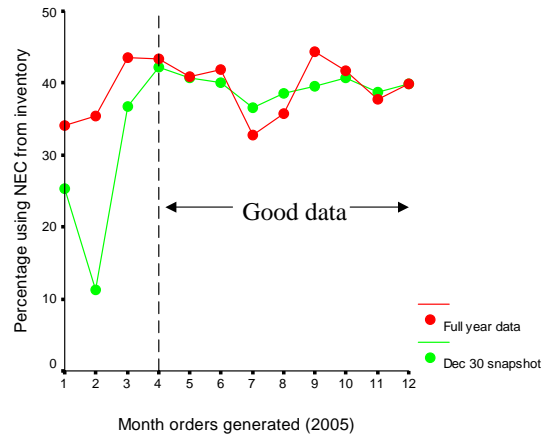
This slide compares the NEC utilization rates from the full-year data set and from the December 30 snapshot. They agree very well 9 months into the past. That should be fine for monitoring NEC utilization.

Summary

- The detailing process seems to be working, but it should be routinely monitored because of its importance.

- The current IT system does not directly support tracking and optimization of NEC utilization. However, data are available that could be used to monitor the detailing process in near real time.

- In examples of how this could be done, we found:
  - CY 2005 NEC cross-sectional utilization from inventory is about 40%
  - CY 2005 NEC cross-sectional reuse is about 30%
  - NEC reuse and cost of orders vary greatly with paygrade and rating
  - NEC reuse saves NPC about $918 per set of orders
  - About 3% of orders need, but do not get, NEC training.

Although the detailing process seems to be working, because of its importance to both performance and perception in the Navy, it should be monitored to ensure satisfactory outcomes for all parties.

The current IT system does not directly support tracking and optimization of NEC utilization, but data are available that could be used to monitor the detailing process in near real time. We presented examples of how this could be done and found the following:

- CY 2005 NEC utilization from inventory is about 40 percent.

- CY 2005 NEC reuse is about 30 percent.

- NEC utilization varies greatly by paygrade and rating.

- NEC reuse saves an estimated $918 per set of orders.

- About 3 percent of orders need, but do not get, NEC training. Rates are much higher for some ratings.

Summary (continued)

- Cost seen by Detailers underestimates total cost to Navy.
  - CNET schoolhouse and Sailor opportunity costs are not visible
- Match of NEC on requisition and on orders should be monitored.
- Comprehensive monitoring of detailing process should be included in future spirals of JCMS.
- Care should be exercised in replacing NEC by Human Capital Objects.
  - Complexity should not exceed capability of Detailers to function with critical systems hard down.
- Whatever measure eventually replaces NECs as a measure of qualifications and job requirements should be monitored, just as we have suggested for NECs.

Total cost as seen by Detailers is underestimated because it includes neither the cost of the schoolhouse nor the opportunity cost of members being retrained vice working in a productive job. Hence, the real value of NEC reuse is underestimated.

The Navy should examine and monitor the match between the NEC on requisition and on orders. We have not examined this issue in detail, but there is reason to believe that it needs attention.

Comprehensive monitoring of the detailing process should be included in future spirals of JCMS.

Replacing NEC by Human Capital Objects must be done carefully. Complexity should not exceed the capability of Detailers to function with critical systems hard down.

It appears that eventually NECs will be replaced by some other measure of qualifications and job requirements. Whatever that measure is, it can and should be monitored in much the same way as we have described for NECs.

Backup Slides

Short Term: EAIS, D-16 Screen

PAGE 16 PENDING ORDERS

SSN xxxxxxxxx NAME DOE JOHN D. ORIG N404EJ1 CNTL NO 3575

STATUS INITIAL ORDERS ON FILE MOD NO 00

RATE AM1   DTG 230324Z DEC 05

DET UIC 66058 CNATTU WI WA   ULT UIC F 55140 VAQ 142

EDD 061100 ATC MWI ACC 100   EDA 061218 ATC MWI ACC 100

CIC ALDK712B ASGNRSN YYY ASGNRT PRD 0901 RSN AA

DELREP 30 OBLISERV 0712   DNEC1 8332   DNEC2 SS 2

ADDITIONAL ASGNRSN Y3   DNRC1 B00A   DNRC2

$ OPTAR N404EJ1   MPN COST 000000   O&MN COST 000000   DEPS COSTED 00

TYPE MOVE OPR

COURSE CDP CLASS ENEC CLCVN GRAD ACC AUIC ATC INT

This is an example of an EAIS D-16 screen.

The D-16 screen captures data on persons who have been detailed but have not yet reported to their new duty station. As such, it contains up-to-date information on how detaining is being done right now. The information is perishable (i.e., it is scrubbed after the Sailor reports to the new duty station), but we will see in later slides that it is adequate to monitor what has been going on during the last nine months.

Important data elements to capture included date, rate, DNEC1, DNEC2, DNRC1, DNRC2, MPN cost, and O&MN (TDI per diem) cost.

Short term: JCMS

At this time, it is not clear what data can be captured from JCMS. If possible,
however, the Preference, Skills, and PCS cost indicator lights from the detail should
be captured and monitored.

Reuse vs. Retraining

- If a Sailor gets training for orders, NPC pays
- What is the decision tree?
  - Maximize use of existing NECs
  - Retrain in local area if possible
  - Retrain out of area only if necessary
- Not all costs are considered in the decision
  - Considered:
    - PCS
    - TDI (per diem) but only at the very end of the process
  - Not considered:
    - Opportunity costs (salary and benefits while training vs. working)
    - Schoolhouse, instructor, and equipment costs

The reuse versus retraining decision is an economic decision. If the Sailor gets training for orders, NPC pays the bill.

The only costs considered in the decision are those paid by NPC—that is, PCS and Temporary Duty In-route (TDI) per diem costs.

Not considered, but also costly to the overall Navy, are opportunity costs (i.e., salary and benefits of a Sailor who is training rather than doing productive work for the Navy). Also not included is the cost of the schoolhouse and the instructors.

Units at full rate/rating capacity for the foreseeable future (detailing window) are encouraged to use their own training dollars to send one of their Sailors to NEC training to fill NEC vacancies. Two problems arise: unit-level training funds are often "tighter" than the Navy-wide funds, and the loss of a person already filling a billet for an extended period of training time is a burden that commands typically are not willing to bear.

Long Term

- Address EPMAC concerns about adequacy of underlying data
- Refine the indicator lights
  - We understand that a POLICY light is currently planned
  - Modify SKILLS light to be green if Sailor has required NEC or is getting required training en route
  - COST buttons should reflect total cost
- Provide standardized monitoring output of all four indicator lights for Detailers and supervisors
  - Show percentage of orders with each indicator color per month for each group of Detailers (rating) and for all NPC

We suggest the following long-term actions:

1. Address EPMAC concerns about the adequacy of data

2. Refine the JCMS indicator lights

    • We understand that a POLICY light is currently planned.

    • Modify SKILLS light to be green if Sailor has required NEC or is getting required training en route.

    • SKILLS light will, of course, need modification to accommodate replacement of NECs by Human Capital Objects.

    • COST button should reflect total cost.

3. Provide standardized monitoring output of all four lights for Detailers and supervisors

    • Show percentage of details with each indicator color per month for each group of Detailers (rating) and for all NPC.

Percentage Using NEC From Inventory
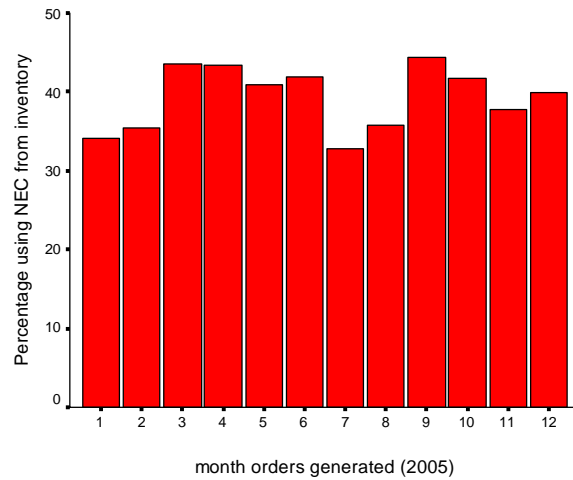
This slide highlights the percentage of orders using an NEC from inventory shown in the previous slide. We will focus on this group for the next two slides.

NEC Background

- NEC codes identify a non-rating-wide skill, knowledge, aptitude, or qualification that must be documented to identify both people and billets for management purposes
- EPMAC is the sole NEC award authority
  - Award based on coursework or OJT
- Types of NECs
  - Entry series
  - Rating series
  - Special series
  - Other
- NEC code relationships
  - Principal NEC
  - Component NEC
  - Related NEC

NEC codes identify a non-rating-wide skill, knowledge, aptitude, or qualification that must be documented to identify both people and billets for management purposes.

The Enlisted Personnel Manpower Analysis Center (EPMAC) is the sole agent with authority to award NECs.

There are many types of NECs. We will focus on Entry series, Rating series, and Special series.

Several NECs function as ratings. That is, they are entirely closed loop (sea-shore), or transitory closed loop (sea-sea or shore-shore), for an entire career. Examples of these include the nuclear field and special warfare (SEALs, divers, and EOD).

The aviation community has some interesting types of NECs that span the domain of aircraft types and identify Naval Air Crew for different aircraft types and missions.

Important code relationships are defined among NECs. Principal NECs identify stand-alone skills or abilities. Component NECs are prerequisites for Principal NECs. Related NECs are similar to Principal NECs but are not prerequisites.

Distribution of DNRC Position 4 Codes (ver2)

DNRC(4)	NEC utilization code category				Total
	Utilized NEC	Got training	Untrained	Misc.	
A	20998			2600[a]	23658
B		20769			20769
C		40			40
D		397			397
E				500	500
F				2	2
G				1291	1291
H				4	4
J,K		12			12
L			91		91
M			1148		1148
N				1073	1073
O				467	467
P				1	1
Q,R			110		110
S				369	369
T			143		143
U			6		6
V				163	163
W				1171	1171
Y				3	3
Z		1916			1916
Total	20998	23134	1498	7704	53334

a. Distribution code 0053.

There are 26 Distribution NEC Reason Codes (DNRCs)—one for each letter of the alphabet. For analysis, we have grouped them into four large categories:

1. Utilized an NEC in inventory

2. Getting training for the NEC

3. Needs training for the NEC, but is apparently not getting it

4. Miscellaneous (mostly, but not exclusively, assignments for which no NEC is required).

This slide shows how we have classified the 26 DNRC codes into four large categories.

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CNA