AIR FORCE BAD ACTOR PROGRAM

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AIR FORCE LOGISTICS MANAGEMENT AGENCY

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The Air Force lacks clear and adequate guidance to define bad actors so that maintainers or managers at all levels can identify bad actor candidates. Lack of such guidance may cause repeated and excessive maintenance actions and adversely impacting the timely repair and visibility of poor performing repairable assets in the field and at the Air Logistic Centers (ALC). Additionally, each depot is using a different system to collect maintenance data. An effectively managed bad actor program will reduce maintenance man-hours and provide valuable data to our depots and contractors for repairing and improving our aircraft systems.

The objectives of this project were to evaluate Air Force policies concerning the bad actor program, evaluate current information systems for "user friendliness", availability of data for use in tracking and identification of bad actor parts, and access to the data and identify any programs or information systems that may be benchmark candidates for expansion Air Force wide.

The study concludes that the Air Force does not have, nor is it capable of having with today's system, an effective bad actor program. To have a successful bad actor program, the Air Force should deal with collecting the correct bad actor data and should develop an integrated system to manage the process at wholesale and retail levels.

Recommend that if the Air Force wishes to continue its policy of having a bad actor program, it must develop a system which identifies bad actor parts throughout the wholesale and retail processes. The bad actor process must be able to identify by serial number which items are potential bad actors and be able to inform users and managers of this situation.
Executive Summary

Problem:

The Air Force lacks clear and adequate guidance to define bad actors. Lack of such guidance may be adversely impacting the timely repair and visibility of poorly performing repairable assets in the field and at the Air Logistic Centers (ALC). Additionally, each depot is using a different system to collect maintenance data.

Objective(s):

1. Evaluate Air Force policies concerning the bad actor program.

2. Evaluate current information systems for "user friendliness", availability of data for use in tracking and identification of bad actor parts, and access to the data.

3. Identify any programs or information systems that may be benchmark candidates for expansion Air Force wide.

Analysis/Results:

Six areas were examined for this study: Technical Order 00-25-258. Air Force Bad Actor Program, Field and Major Command Perceptions, Air Logistics Center Concerns, Data Errors, Data Systems, and Air Logistics Center Bad Actor Programs. We were unable to evaluate the effectiveness of the bad actor program, since there are no metrics for measuring effectiveness or data for performing a cost benefit analysis. We did review current policies, procedures and made several recommendations to improve the management of the bad actor program.

Conclusions

If the Air Force is to successfully manage the bad actor program, pertinent information needs to be available to those who work the maintenance process. Logistics data systems must pass bad actor data from organizations who have the information to those who use it.

We conclude that:

1. The absence of an education program creates a perception at field units that there is no bad actor program at the ALCs. A misperception within the bad actor program has caused several problems and causes the program to be run ineffectively.

2. Lack of access to all available data systems is a problem:
   a. Various "stove-piped" data collection systems makes identifying bad actor items across MDS's nearly impossible.
   b. Lack of access to repair data from base and depot level data systems prevents equipment specialists from identifying and controlling repair actions on bad actors.
   c. Lack of a single office within the ALCs for gathering maintenance data has contributed to equipment specialists and engineers making decisions concerning potential bad actor candidates with only partial maintenance data information.

3. Lack of a single point of contact for bad actors at HQ AFMC to maintain and enforce bad actor policy has contributed to the fact that there is no standardization policy for bad actors policy within AFMC.
Recommendations

Short Term

1. Review edits in CAMS and REMIS so that all maintenance data is accurately captured.  
   (OPR: HQ USAF/ILM)

2. Incorporate T.O. 00-25-258, *Air Force Bad Actor Program*, into T.O. 00-20-2, *Maintenance Data Collection System*; there is no need to have a separate T.O. for bad actors. Add a bad actor program chapter to T.O. 00-20-2 stating the definition of bad actors, characteristics of program, and responsibilities of each agency.  
   (OPR: HQ AFMC/LGM)

3. Establish a single point of contact for the Air Force bad actor program at HQ AFMC to do the following:
   a. Ensure program is functioning at all levels of maintenance.
   b. Be the focal point for problems associated with the program, for both the field and ALC levels.
   c. Brief program status to weapon system managers, product improvement meetings, and provide overall visibility of program to all levels of maintenance.  
   (OPR: HQ AFMC/LGM)

4. Establish a single point of contact at each ALC to accomplish the following:
   a. Ensure the program is working within the guidelines at their level.
   b. Ensure that equipment specialists have access to all available data information to make good decisions concerning potential bad actors.
   c. Gather bad actor program performance and cost data for HQ AFMC single point of contact.  
   (OPR: HQ AFMC/LGM)

5. Establish a program similar to O0-ALC’s GateKeeper at each ALC to provide information from G021 and all data systems available to equipment specialists. This central office would ensure equipment specialists have all data available to make decisions concerning a potential bad actor.  
   (OPR: HQ AFMC/LGM)

6. Establish an education program where the ALC program managers from the respective weapon systems brief field level units on their bad actor program. This would provide feedback and show them that bad actor parts are being looked at and worked.  
   (OPR: HQ AFMC/LGM)

7. Create a method for the ALC developed data systems to feed maintenance data to REMIS. This would ensure that all maintenance data is collected in one central location and available to all users.  
  (OPR: HQ AFMC/LGM)

Long Term

1. Establish a centralized Air Force data repository (such as IMDS) with serialized item tracking. Additionally the ALCs data collection systems must be able to interface with this central data repository to track entire life history of the item.  
   (OPR: HQ USAF/IL)
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Introduction

Background

For the purpose of the study we have defined "bad actors" as follows: 1. A line replaceable unit (LRU) or shop replaceable unit (SRU) that has a failure rate (both on aircraft and in support shop) significantly higher than identical items with the same stock number. Sometimes referred to as "lemons", these items are constantly in the repair pipeline at either the base or depot level; 2. An individual item that fails on the aircraft, but is repeatedly declared bench-checked-serviceable (BCS) or retest OK (RETOK) at either the support shop or the depot repair facility. Bad actors are items that consume more than their proportionate share of maintenance resources.

Problem Statement

The Air Force lacks clear and adequate guidance to define bad actors so that maintainers or managers at all levels can identify bad actor candidates. Lack of such guidance may cause repeated and excessive maintenance actions and adversely impact the timely repair and visibility of poor performing repairable assets in the field and at the Air Logistic Centers (ALC). Additionally, each depot is using a different system to collect maintenance data. An effectively managed bad actor program will reduce maintenance man-hours and provide valuable data to our depots and contractors for repairing and improving our aircraft systems. The Air Force is spending too much time repairing bad actors. These items should be among the first assets retired.

Objectives

The objectives of this project are:

♦ Evaluate Air Force policies concerning the bad actor program.

♦ Evaluate current information systems for "user friendliness", availability of data for use in tracking and identification of bad actor parts, and access to the data.

♦ Identify any programs or information systems that may be benchmark candidates for expansion Air Force wide.

Methodology

We used inputs from subject matter experts from the Senior Non-Commissioned Officer Academy (SNCOA) concentrated study area (CSA) problem solving class, field level personnel, MAJCOM functional managers, ALC System Program Directors and existing documentation to determine the current policies which govern the bad actor program and the program's effectiveness.

We performed site visits to Ogden ALC (OO-ALC), Oklahoma ALC (OC-ALC), and Warner Robins ALC (WR-ALC) to document existing bad actor programs noting which programs contain the types of data required for a successful bad actor program.

We analyzed existing bad actor programs and benchmarked programs that may be candidates for a successful bad actor program.
Analysis

OVERVIEW

After visiting three ALCs and looking at their bad actors programs we determined that all three ALCs do, in fact, have bad actor programs. However, each has a different means of tracking and determining potential bad actors. Additionally, there does not seem to be any system in place to track bad actor program cost effectiveness or metrics to track success or failure of the program. Specific observations are discussed below.

I. Misperceptions

1. The perceived effectiveness of the Air Force bad actor program depends upon which organizational level is examining it. SNCOA inputs indicated that field-level units think the program is broken. Field level perceptions include:

- Current data systems are not adequate to identify and track bad actors
- ALCs developed their own bad actor programs without clear guidelines
- Program is driven by field-level units not the ALCs

Additionally, not everyone at the base level is aware of the bad actor program. While intermediate level (support shop) personnel were aware of the program, the shops we contacted did not have a copy of the Air Force Bad Actor Technical Order 00-25-258. These shop personnel understood how the bad actor program worked and who to contact if they had a problem. On the other hand, the SNCOA CSA identified that flightline technicians were unaware or knew very little about the bad actor program. Even if they were aware of the program, they did not know how it worked. This problem is further compounded because there is no single point of contact for the bad actor program at HQ AFMC or the ALC’s.

Clearly, there is a need for all levels of maintenance to be aware of the definition and characteristics of a bad actor especially under a two-level maintenance concept. Specifically, under 2LM, failure and troubleshooting on the aircraft will be the only documentation available to the equipment specialists and engineers at the ALCs to make decisions concerning potential bad actors. Therefore, flightline technician awareness, involvement and proper documentation is crucial.

On the other side of the spectrum, MAJCOM functional managers, ALC managers, and contractors believe the bad actor program is working and requires only minor improvements to make it function well at all levels. In fact, our site visits revealed a bad actor program at all the ALCs.

2. A bad actor item is a ‘lemon’ but some personnel also define a bad actor as a ‘population problem’. There is a misperception of what is a potential bad actor. The following Air Force definition as stated in Technical Order 00-25-258, Air Force Bad Actor Program, outlines what a ‘lemon’ bad actor is:

Bad Actor—An individual serialized LRU or SRU that repetitively enters the repair cycle at a rate significantly higher than the total population of items with that same national stock number or part number. Some characteristics of Bad Actors are:

- Lower MTBF than the general population.
- Fails on the system but is repeatedly declared Bench-Checked-Serviceable (BCS) or Retest Okay (RTOK).
- Has a history of failures that indicates a latent, unidentifiable defect.
This definition is being used by ALC personnel we contacted during our site visits. However, there is a perception among equipment specialists that different systems and subsystems have different operating and failure characteristics. Therefore, each equipment specialist or engineer refined the basic definition (relating to number of BCS or RETOK actions on an LRU) to meet the needs of the items they managed.

As stated earlier, there is also a 'population problem' bad actor. The perception at the field levels that the high RETOK rates with the ALR-56M RTWS system is less than satisfactory and is a bad actor problem, is in fact a 'population problem'. Several things impacted the failure of the ALR-56M RTWS and this problem was spread across the entire population and not just a few specific LRUs:

a. The system has gone through several hardware and software changes since installation on the F-16 aircraft. This has given the technicians at the field level a perception that the items are not very reliable and the configuration (software and hardware) is always in a state of change.

b. Aircraft wiring on the F-16 has caused several problems with the reliability of the ALR-56M RTWS system, driving several engineering change proposals.

c. Accurate and detailed documentation concerning failed LRUs from the field level maintainer continues to be a major problem for both Warner Robins ALC and Loral. Poor documentation from the field units cause potential bad actors not to be identified.

d. Warner Robins ALC did have a system for tracking potential bad actors within the ALR-56M RTWS

II. Data Systems and Errors

1. There are currently six systems in use today to track and identify bad actors. Some examples are: Smart Shop, Programmed Depot Maintenance Scheduling System (PDMSS), Reliability and Maintainability Information System (REMISS), Tactical Interim Core Automated Maintenance System (CAMS) and REMIS Reporting System (TICARRS), Avionics Two Level Information System (ATLIS), and Quality Assurance System Database (G021). Table 1 shows strong points of several systems being used. REMIS is the only centralized data base that provides a complete maintenance history across MDSs. But only two of these data systems feed REMIS: TICARRS at Ogden ALC in the F-16 avionics shops and ATLIS at Oklahoma ALC in the two-level PACER LEAN avionics shop.

The following example highlights the need for a centralized data base. Aircraft items can be used on multiple mission design series (MDSs) and can be managed by more than one ALC. Dependency on a system like TICARRS to determine bad actor candidates limits the tracking of items to F-16/F-15 units. Ogden ALC, and Warner Robins ALC. TICARRS cannot provide a complete maintenance history for items across different MDSs. On the other hand, equipment specialists who use REMIS can retrieve maintenance history across MDSs because REMIS is not MDS specific. An example is the LN-39 Ring Laser Gyro Inertial Navigation Unit (managed by Oklahoma City ALC), a unit that both the A-10 and F-16 use. This is not a single occurrence, there are several LRUs on the F-16/F-15 that are used on other MDSs.

Another system used by equipment specialist for bad actor tracking is G021. The problem with relying only on G021 is that no data is fed to any other central maintenance database system. This system is for deficiency reporting only and data is not readily accessible to all users.

There are two systems used by the field to report bad actors, CAMS and CAMS for Mobility (G081). CAMS is used by MAJCOM to document maintenance actions while CAMS for Mobility is used by Air Mobility Command to perform the same task. Both systems accumulate field level maintenance data, which is used for a variety of purposes including reporting bad actors through the Quality Deficiency Reporting (QDR) process. Of the two, only CAMS has automated the transmission of QDR data to G021. TICARRS and REMIS. CAMS for Mobility reports QDR data by keypunching G081 data into the G021 record layout and transmitting the resulting file to the G021 system. Interestingly, some ACC units have opted to use this reporting method over CAMS. The net result is to reduce the reporting to REMIS and TICARRS, which in turn handicaps AFMC's ability to identify bad actors.
GO81 provides no useful maintenance data to equipment specialists for bad actor tracking when interfaced with REMIS. The interface between GO81 and REMIS does not include serial number tracking information or narrative information on the item. Therefore, when information is needed from a unit using GO81, direct access to GO81 is required.

The lack of an Air Force central maintenance data base hinders an effective Air Force Bad Actor Program. Each equipment specialist interviewed felt that the data they were using was providing them with the best information to make decisions concerning bad actor items. However, if equipment specialists at Ogden and Warner Robins ALC use REMIS with their current program they will have a better picture of the actual maintenance history for the parts they are tracking. If Oklahoma ALC would augment their current bad actor program identification programs with GO21, they would have a better all round picture of the actual maintenance history to include deficiency reporting actions.

<table>
<thead>
<tr>
<th>ALCs</th>
<th>Systems</th>
<th>Strong Point</th>
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<tbody>
<tr>
<td>Ogden</td>
<td>TICARRS</td>
<td>- Feeds REMIS and ensures complete maintenance history of item</td>
</tr>
<tr>
<td></td>
<td>G021</td>
<td>- Depot inputs repair data for deficiency reports and provides complete</td>
</tr>
<tr>
<td></td>
<td></td>
<td>deficiency history of item</td>
</tr>
<tr>
<td>Oklahoma City</td>
<td>REMIS</td>
<td>- Provides maintenance history for items across all MDSS</td>
</tr>
<tr>
<td></td>
<td>ATLIS</td>
<td>- Feeds depot maintenance data to REMIS; ensures complete maintenance</td>
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<tr>
<td></td>
<td></td>
<td>history of item</td>
</tr>
<tr>
<td>Warner Robins</td>
<td>G021</td>
<td>- Depot inputs repair data for deficiency reports and provides complete</td>
</tr>
<tr>
<td></td>
<td></td>
<td>deficiency history of item</td>
</tr>
<tr>
<td></td>
<td>Smart Shop</td>
<td>- Provide depot maintenance history to depot repair shops</td>
</tr>
</tbody>
</table>

2. The current Air Force information system for collecting maintenance data, REMIS, is a good tool for bad actor tracking because it tracks items by serial number. However, due to errors within the REMIS data base, a portion of base level avionics support shop maintenance data was missing from REMIS. A comparison was done of TICARRS and REMIS data for selected avionics work unit codes, over a six month time frame. The data showed that 5 percent of the flightline information was in error between the two systems and that 11 percent of the documented avionics support-shop maintenance was also in error. The possible errors between the two systems could be data edits employed by both systems. The edits within REMIS allow for no errors while TICARRS will look at several different elements of the record to determine if the record is truly in error. Due to REMIS having tight edit checks and CAMS having few, the possibility of not capturing a complete maintenance history exists. Thus equipment specialists and engineers who are using only REMIS data might be making decisions concerning potential bad actors with incomplete information.

III. Air Logistics Center

1. The ALCs have some concerns with bad actors they were receiving from the field. Specifically, field units were cannibalizing SRUs out of potential bad actors to repair other LRUs. The carcasses being received at the ALCs are now full of bad SRUs and the LRUs are no longer in the configuration they were in at the time of failure. This makes it virtually impossible to accurately troubleshoot that bad actor LRU. The ALCs may be wasting time and money trying to troubleshoot bad actor LRUs in this condition. Additionally, SRUs from the bad actor have migrated to other LRUs. Cross-canning of SRUs from a potential bad actor jeopardizes the integrity of the item as a bad actor exhibit and can no longer be inducted into the bad actor process. There is also a possibility that
problems exhibited in the original bad actor have now migrated to other LRUs due to the cross-canning of bad actor SRUs possibly causing the problem to be spread across several LRUs. So, what does the Air Force do to solve this problem? Education is the key to solve this problem. The ALCs with MAJCOM support need to educate the field level maintenance people on the results of cross-canning potential bad actors and the time and money being wasted at the ALCs trying to fix these items.

2. All three ALCs made efforts to identify bad actors. Ogden ALC uses a program called GateKeeper that helps both equipment specialists and engineers gather the required data to identify potential bad actors. A flow diagram of this process is included in the Appendix. The GateKeeper, upon receiving a deficiency report, retrieves data from G021 and TICARRS and recommends if the item warrants a bad actor study. This initial recommendation (along with the data) then goes as a complete package to the equipment specialist for final recommendation. The GateKeeper gathered all of the required data for the equipment specialist and engineers to provide an initial recommendation concerning this potential bad actor. This process saves time for equipment specialists and engineers; they did not waste time collecting data. We recommend this program in all the ALC’s bad actor programs.

3. Oklahoma City ALC’s use of ATLIS within the Two Level Avionics Pacer Lean Shop provides maintenance technicians and supervisors with the required data to identify potential bad actor items. ATLIS is an excellent data collection tool; it feeds maintenance data to REMIS thereby capturing the entire maintenance history of the item. Warner Robins ALC placed a sticker (called PACER ACTOR) on all of its repaired avionics bad actor items. The sticker provides points of contact at the ALC if the item fails for the same previous failure or if the item fails shortly after installation on the aircraft. This program is a carry over from Tactical Air Command’s bad actor program and works well in the F-15 avionics community.

IV. Ideal Bad Actor Program

An ideal bad actor program requires the following:

1. A centralized data system that has all LRU maintenance history data available to all users.
2. A coordinated effort between all levels of maintenance to be able to troubleshoot the problem.

Ideally, (in the short term) REMIS would be the centralized data system for LRU maintenance data history. Base level narratives would provide specific information such as failure information from the technical order, aircraft failure codes and LRU failure codes. This would replace the current data seen in our data systems such as LRU ‘bad’ or ‘broken’. Depot level maintenance actions would also exist in REMIS. Each ALC would have a single point of contact for the bad actor program and also have an office similar to the “GateKeeper”. Ideally the GateKeeper office would consolidate REMIS and G021 information for the equipment specialist and engineers for working potential bad actor LRUs. Policies concerning bad actors would be established by HQ AFMC, and would be outlined in T.O. 00-20-2, Maintenance Data Collection System, in a Bad Actor Program chapter. All of these actions are relatively easy to implement (as well as not expensive) and would make the current program run more effectively.

In the long term, IMDS would be the central database. The GateKeeper office would no longer be necessary because the equipment specialist or engineer would have all of the information from IMDS (one source). HQ AFMC would still provide guidance and maintain the Bad Actor Program chapter in the technical order.
Conclusions and Recommendations

Conclusions

If the Air Force is to successfully manage the bad actor program, pertinent information needs to be available to those who work the maintenance process. Logistics data systems must pass bad actor data from organizations who have the information to those who use it.

We conclude that:

1. The absence of an education program creates a perception at field units that there is no bad actor program at the ALCs. A misperception within the bad actor program has caused several problems and causes the program to be run ineffectively.
2. Lack of access to all available data systems is a problem:
   a. Various “stove-piped” data collection systems makes identifying bad actor items across MDS’s nearly impossible.
   b. Lack of access to repair data from base and depot level data systems prevents equipment specialists from identifying and controlling repair actions on bad actors.
   c. Lack of a single office within the ALCs for gathering maintenance data has contributed to equipment specialists and engineers making decisions concerning potential bad actor candidates with only partial maintenance data information.
3. Lack of a single point of contact for bad actors at HQ AFMC to maintain and enforce bad actor policy has contributed to the fact that there is no standardization policy for bad actors policy within AFMC.

Recommendations

Short Term

1. Review edits in CAMS and REMIS so that all maintenance data is accurately captured.
   (OPR: HQ USAF/ILM)

2. Incorporate T.O. 00-25-258, Air Force Bad Actor Program, into T.O. 00-20-2, Maintenance Data Collection System: there is no need to have a separate T.O. for bad actors. Add a bad actor program chapter to T.O. 00-20-2 stating the definition of bad actors, characteristics of program, and responsibilities of each agency.
   (OPR: HQ AFMC/LGM)

3. Establish a single point of contact for the Air Force bad actor program at HQ AFMC to do the following:
   a. Ensure program is functioning at all levels of maintenance.
   b. Be the focal point for problems associated with the program, for both the field and ALC levels.
   c. Brief program status to weapon system managers, product improvement meetings, and provide overall visibility of program to all levels of maintenance.
   (OPR: HQ AFMC/LGM)

4. Establish a single point of contact at each ALC to accomplish the following:
   a. Ensure the program is working within the guidelines at their level.
   b. Ensure that equipment specialists have access to all available data information to make good decisions concerning potential bad actors.
   c. Gather bad actor program performance and cost data for HQ AFMC single point of contact.
   (OPR: HQ AFMC/LGM)

5. Establish a program similar to 00-ALC’s GateKeeper at each ALC, to provide information from G021 and all data systems available to equipment specialists. This central office would ensure equipment specialists have all data available to make decisions concerning a potential bad actor. (OPR: HQ AFMC/LGM)
6. Establish an education program where the ALC program managers from the respective weapon systems brief field level units on their bad actor program. This would provide feedback and show them that bad actor parts are being looked at and worked. (OPR: HQ AFMC/LGM)

7. Create a method for the ALC developed data systems to feed maintenance data to REMIS. This would ensure that all maintenance data is collected in one central location and available to all users. (OPR: HQ AFMC/LGM)

**Long Term**

1. Establish a centralized Air Force data repository (such as IMDS) with serialized item tracking. Additionally, the ALCs data collection systems must be able to interface with this central data repository to track entire life history of the item. (OPR: HQ USAF/IL)

**DISTRIBUTION:** Refer to attached Standard Form 298.
APPENDIX

Decision Flow Process for F-16 Avionics
Ogden/SPO Managed LRUss