MAINTENANCE HUMAN FACTORS TECHNICIAN TRAINING: GET IT RIGHT THE FIRST TIME!

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Selling MX Human Factors Training to Technicians: Not an Easy Job!

"This had better be good"

In ones and twos, technicians slowly wander into the classroom. A few offer a greeting but most simply make their way to the chairs. The back of the room fills first. Most ignore the instructor, talking with coworkers and sipping on coffee. A few fold their arms, lean back in their chairs and eye the instructor warily. The message is unspoken but clear; "This had better be good." 0800 arrives. After a short introduction, technicians are hit with the question: "How many of you are glad to be here?" No one speaks. Some look down. A few exchange knowing glances. The rest just continue to stare. Another human factors training class begins.

"Selling" human factors to maintenance technicians can be a daunting task. Having endured a multitude of tried and failed improvement programs over the years, it is no wonder this program appears as simply more of the same. "Flavor of the Month" is the term most often heard. Others compare it to a bad case of indigestion with the wistful words. "This too shall pass."

And yet, as the day progresses, a transformation begins to take place. At first, the strained silence is broken only by short, obligatory answers to prepared instructor questions. By hour two, the dialog level begins to rise as technicians warm to the importance of the topic. By 11 a.m. the room is buzzing with the chatter of small groups working together to analyze human factors that have contributed to various incidents. By the end of the day, skepticism has turned to enthusiasm. Negativism is replaced by comments like, "This training was great", "Superb course", and "We should have started this a long time ago". So positive is the response that the statement "The quality of the training was excellent" receives an average rating of 4.7 (out of a possible 5) from technicians (FSB *End of Class Report Data*, 11/2001).

The Total Program

More than just training

Technician support is essential to any successful human factors error-reduction program. As the previous paragraphs illustrate, however, this support is not automatic. Garnering this support involves more than just training. It involves the implementation of a total program in which certain conditions must both exist and *be evident*. These conditions include the following:

- A practical, team-based approach to the issue of reducing errors
- Support from management

• A clear, fair and consistently applied discipline policy

A practical, team-based approach to the issue of reducing human error

Overcoming the technician stereotype of programs like human factors as "Charm School" or "Hug-a-Tree 101" requires the program to have a practical utility that any technician can readily understand and in which they can actively participate. Implementation of an errorreduction process (such as the Boeing MEDA Process) can provide just such practical utility. With this process, when an incident occurs, technicians are involved in both identifying human factors that contributed to the incident as well as recommending strategies to reduce further occurrences. This process removes technicians from the cross hairs of "Who made this error?" and instead encourages them to take part in a team working to discover why the error occurred. Participating in the process allows technicians to come face to face with the practical reality of human factors, how these factors contribute to errors and their role in preventing future incidents. *Support from management*

At the conclusion of human factors training, the most frequently heard negative comment is not "This won't work" but rather "This sounds great but will our management support and follow through with it?" The vision of management and technicians working together to identify and eliminate the factors that lead to errors seems improbable to many MX personnel. Given the track record of some aircraft maintenance organizations in this area, their skepticism is understandable. A strong initial statement of support, delivered personally by a ranking company manager, and accompanied by consistent follow-through over time is required to overcome this skepticism and encourage technician support and participation.

A clear, fair and consistently applied discipline policy

When the MEDA Error Investigation Process was first introduced to the airline industry, it struggled. The reason? The process relies on MX personnel to provide critical data about the factors that caused the error. If these same personnel are unsure, however, as to how the collected data is to be used, it is a natural human response to be less than forthcoming. For this reason, it is vital that a human factors error reduction program include a policy that does not punish MX personnel for unintentional errors. While the complexities of this subject are beyond the scope of this paper, suffice it to say that this is an issue that must be appropriately addressed and communicated to MX personnel.

The Training Program

Introduction

As previously mentioned, MX personnel are naturally skeptical of these types of "soft skill" classes. I have found the wisest approach is to not to ignore this skepticism but rather to address it head on through the use of a vigorous and well-reasoned introduction. To this end I pose to the class two questions: (1) "What is human factors?" and (2) "Why should I care?"

The first question addresses skepticism that springs from a misunderstanding of the topic itself. HF is a huge subject. Even under the best conditions, defining the term can be a messy job. Clear, practical definitions of terms such as "human error" and "MX error", accompanied by real-life examples, can begin to build the case that this is perhaps, after all, a topic worthy of attention.

Achieving a high level of "buy-in", however, requires a convincing answer to the second question, "Why should I care?" Strong evidence in both the areas of aviation safety and

economics are needed Properly presented, this evidence leaves no doubt in the mind of the MX professional that this is a topic that both requires and is worthy of their support.

Contributing Factors

Any successful effort to reduce MX errors must address the issue of how various human factors contribute to these errors. The assumption that most maintenance errors have identifiable causes is fundamental to this effort and is a concept that must be well understood by MX personnel if they are to effectively participate in the program. To this end I employ, once again, two questions: (1) "What are contributing factors?" and (2) "How do contributing factors lead to errors?"

In keeping with the educational principle that an instructor should never tell students what he/she can help them discover for themselves, I allow the class to answer the first question on their own. To do this I divide the class into groups of two or three. I then give them a common MX error situation, such as a valve installed incorrectly, and ask them to think of as many possible factors as they can that could have contributed to this error. In a matter of only a few minutes, most groups have amassed a list of 10 to 20 factors. A brief discussion of their responses suffices to provide a very satisfactory answer to the question, "What are contributing factors?"

To address the second question, I begin by borrowing shamelessly from Dr. James Reason and his ingenious "Swiss Cheese Illustration". This illustration, accompanied by one or two real-life examples of how a chain of factors contributed to an actual incident, provides a clear answer to the question, "How do contributing factors lead to errors?"

Error Investigation Process

It is vital that MX personnel understand the error investigation process. This understanding is critical for two reasons: (1) It allows MX personnel to actively and effectively participate and (2) a proper understanding of the program can significantly reduce fear (and all its negative effects) the first time a technician is called to participate in an investigation.

Active participation in the error investigation process by MX personnel is vital to the program's success. Technicians are invaluable "eyes and ears" for detecting factors that lead to errors. In addition, when an incident occurs, the personnel involved in the incident are probably the most likely source of helpful information related to the error. A proper understanding of both the "how" and "why" of the investigation process is essential.

The best method I have found for achieving this objective is the use of case studies. Case studies of incidents provide the opportunity for MX personnel to participate in an investigation in a non-threatening way. Working alone or in groups, students use the investigation tool (in our case, the MEDA checklist) to identify factors that contributed to the incident. This exercise, followed by a class discussion, provides an excellent method to familiarize MX personnel with both the purpose and the method of error investigation.

Why Versus Who

"The purpose of error investigation is not to determine who made the error but rather why did this error occur." This statement forms the foundation of any effective teamwork between management and MX personnel in the effort to reduce errors. It is vital that a MX organization have a discipline policy that is clear, fair and consistently applied and does not punish personnel for unintentional errors. It is equally important that the nature of this policy and management's commitment to follow the policy be communicated to MX personnel. The human factors training program provides an excellent opportunity to do this.

Personal Error Reduction Strategies

Once technicians grasp the nature of human factors in MX, understand how the program works and have at least some degree of confidence that management plans to follow through, the next step is to arm them with personal strategies they can use to reduce errors. Whether we call them "strategies", "safety nets" or some other term is not important. What is important is that we provide MX personnel with practical steps they can take to reduce errors. Personal strategies might include eating a good breakfast, getting enough sleep or resisting negative peer pressure. On an organizational level, strategies may involve better communication processes, initiating provides an ideal opportunity to bring up these subjects, discuss them and provide practical strategies technicians can take with them and use.

Summary

Reducing human errors in maintenance requires more than just training. It requires a total error-reduction program. Training, however, is an important part of that program. Properly conducted, HF training convinces maintenance personnel of the value of the program and communicates clearly their role in helping the program to succeed. Improperly conducted, this training merely reinforces technician skepticism or fails to provide them the practical "tools" essential to program success. For this reason, when it comes to human factors training, get it right the first time!