

tied in with fundamental elements of human behavior that go beyond a good day's work for a good day's pay.

Again, the Detroit automobile makers provide an example of an increasingly cooperative relationship between management and labor. In many cases, management has given up a certain degree of policy control while labor has sacrificed pay and fringe benefits, all for the common good of the organization. It took a financial disaster for both sides to recognize that their respective fates were inseparable.

We must be cautious, however, about placing too much emphasis on the traditional role of union leadership. Many indicators suggest that union members are becoming as alienated from their leadership as they have traditionally been from management. According to the June 24, 1980, Wall Street Journal "Labor Letter", workers voted to repudiate their unions in 75 percent of the 1979 decertification elections nationwide, the second highest percentage in 30 years (figures are not available for 1980-1981). Furthermore, in a survey published in the Journal's "Labor Letter" on May 16, 1980, the number of union members favoring laws that state workers cannot be required to join a union or pay dues rose from 43 to 72 percent. These and other signs show that employees themselves must be dealt with directly in solving major human resource problems. Union representatives, though elected, should no longer be viewed as being capable of speaking for their membership in all matters.

Another important task to be completed in the early stages of this effort is to convince the policymakers of the importance of the undertaking. Without their continuing support, the comprehensive and time-consuming job of human resource improvements cannot take place. At the core of this selling job is the familiar trade-off between long-term goals and short-term, day-to-day responses. Unlike private enterprise, we do not have an objective improvement measure like the profit margin to help us monitor success. Our criteria will be much less tangible and therefore less likely to be understood by the policymakers. However, a nationwide, coordinated approach should be helpful in this regard.

Organizationally, the bus maintenance industry must establish a coordinated, comprehensive approach. Human resource problems are shared by many properties, and the needed solutions are too complex for a piecemeal attack. Entities such as UMTA or APTA provide the type of organizational structure needed. In fact, there probably exist committees or subgroups at both of these agencies that have been charged with such responsibilities.

SUMMARY AND CONCLUSIONS

The human resource problem in bus maintenance has developed over many years. The decline of the workplace environment and the increasing complexity of the organizational structure are major contributors to this condition. Diminishing worker skills, or the perception of diminished skills, and motivational deficiencies have also had significant impacts on labor's effectiveness. Research indicates that workers' changing view of the job and the concomitant need for self-actualization and self-esteem also influence the present situation.

Better on-the-job reference material improves the motivation and self-esteem of the mechanic while also improving vehicle reliability. Enlarging the scope of the traditional supervisor's role to include an awareness of changing job values and difficulties related to worker motivation also helps overall human resource management. Furthermore,

standardizing personnel practices and clearly defining departmental objectives and priorities through supervisory staff improve staff harmony.

Once the industry confirms these findings nationwide, a series of pilot programs can be developed in order to refine improvement actions. It may then prove cost effective to set up regional "schools" where managers and supervisors can be taught these techniques and be provided with the appropriate written documentation to take back to their bus properties.

REFERENCES

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Workshop Report

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Participants in Workshop 3 identified the following eight problem areas in their review of the topic, human resources for maintenance:

1. Performance measurements and standards,
2. Technical information and training,
3. Line-level maintenance supervisors,
4. Upper-level maintenance managers,
5. Motivation,
6. Upper-level management awareness of maintenance needs,
7. Training packages, and
8. Communication.

All were felt to warrant action. High priority was assigned to performance measurement, training, and line-level supervision. Medium priority was assigned to technician motivation and communication skills of upper-level maintenance management. Lower priority was assigned to upper-level management's awareness of the importance of maintenance, training packages, and interproperty communication.

PERFORMANCE MEASUREMENTS AND STANDARDS

Problem

The general lack of performance standards in maintenance hampers both training and planning. The associated lack of performance measurements makes it very difficult to quantify the effects of improvement techniques, such as better management techniques and better maintenance training and information packages.

The need for computerized performance measurements and standards is especially acute in maintenance because of management's general lack of interest in maintenance and maintenance-related variables. One way to communicate effectively with

upper-level management is to show the effect of budget and manpower allocations in dollar terms or in other system-level parameters meaningful to upper-level management (miles between road calls, missed runs, etc.). Computerization is important to ensure timely measurements and feedback.

Although many properties share the problem, discussions indicate that some properties have developed effective standards and measurements. In addition, it was generally agreed that the problem is not unique to mass transit. Therefore, it appears reasonable to assume that organizations in other industries will have solution concepts or techniques that would be readily applicable to mass transit properties.

Solution

The workshop group suggested that UMTA fund a survey of both transit properties and other industries regarding application of "work standards" and measurement techniques. This survey should pay special attention to the abuse of work standards and to making managers sensitive to the dangers of such abuses.

Time-related work standards are especially vulnerable to misuse or abuse by managers. Workers often feel that such standards can rapidly lead to pressure to perform faster without compensatory pay. Studies have shown that error rates are far more important to maintenance than time of performance. Consequently, standards that emphasize time only without considering errors could lead to counterproductive techniques.

It is also important to recognize that many maintenance errors today are being committed by experienced technicians. Thus, standards should not merely reflect the current work of experienced technicians but should reflect a level of performance achievable with proper maintenance information and training.

A prime example of how work standards can be used effectively is the program at Seattle Metro, where the standards are used to establish productivity measures and diagnose problems rather than apply pressure to individual workers.

Due to the potential for abuse in this area, the dissemination of the survey results should be restricted to a training program designed specifically to communicate the concepts and techniques to interested parties; that is, in disseminating the information by a noninteractive method, there is too great a potential for misuse of techniques. Therefore, the training technique should be communicated by specific training programs or extensive workshops that would provide ample opportunity to communicate the dangers of abuse and misuse.

TECHNICAL INFORMATION AND TRAINING

Problem

Maintenance manuals in mass transit do not provide the information necessary to support (a) entry-level training and/or (b) journeyman technician performance on the job. As a consequence, training tries to overcome the problem through extensive application of standard training techniques. Experience in other fields indicates that such an approach will not meet the maintenance needs of mass transit: Technicians prepared in this manner normally have a relatively high rate of errors due to overreliance on memory and/or their knowledge of fundamentals.

The military has recognized the interaction between maintenance information and training. The U.S. Army is committed to a new type of manual that

will be usable on the job. All new systems require the use of these simplified manuals and integration of the manuals with training. Both the U.S. Navy and Air Force are moving in the same direction.

The military has learned that problems of poor maintenance performance cannot be resolved without first providing maintenance information (e.g., procedures) that can be used on the job. However, this information is necessary but not sufficient; training and other components of the personnel subsystem must still be adjusted to take advantage of the availability of usable maintenance information.

As more equipment technologies are applied to mass transit vehicles, the problem is expected to become even more severe.

Solution

The workshop group felt that UMTA should continue the program for solving the maintenance manual problem by applying JPAs and related techniques. Transit properties should learn how to integrate such information packages with training to (a) help overcome the temptation to avoid training by providing simplified manuals and (b) help technicians to learn to rely on the manuals rather than on their memory. Also, manufacturers and vendors should be required to deliver JPAs or their equivalent with the equipment as a useful supplement to other manufacturers' manuals, training programs, and service bulletins.

LINE-LEVEL MAINTENANCE SUPERVISORS

Problem

In many transit operations, not enough is known about what criteria should be used to select line-level maintenance supervisors and/or how to train them effectively. In many cases, technicians are promoted to the supervisory level based on their technical capabilities but fail as supervisors due to inadequate "people skills". Similarly, new supervisors often encounter difficulties in supervising others due to either inadequate technical knowledge or erosion of such knowledge.

In contrast, some properties have been quite successful in both identifying and training line-level maintenance supervisors. Therefore, there is a need to both find and communicate proven selection and training techniques.

Solution

The workshop group suggested that UMTA fund a project to survey transit properties for working solutions and develop a means of communicating this information to all other properties. An example of a potentially effective approach is the "lead man concept" being tried at Seattle Metro and the "supervisory trainee concept" being tried at Denver RTD. Both approaches provide an opportunity to observe the potential of an individual before selecting him or her for a supervisory role. The training method thus serves as a selection process as well.

UPPER-LEVEL MAINTENANCE MANAGERS

Problem

Some of the problems attributed to the lack of awareness of maintenance-related variables by upper-level management can also be attributed to upper-level maintenance managers who do not have proper communication skills. This need is often cited by the managers themselves. The lack of proper

communication skills compounds the problems of "inadequate allocation of resources for maintenance", especially for properties with upper-level managers who are biased against or ignorant about maintenance.

Solution

The workshop group suggested that UMTA sponsor the development of a training package that can be implemented in different modes. This package should focus on the necessary communication skills, including the type of data needed to get the attention of upper-level management. The package should be distributed to all interested properties, including existing management training programs.

MOTIVATION

Problem

There are severe problems in motivation and attitude among maintenance technicians, problems that are significantly greater in some properties than in others. This variance between properties would indicate that management awareness and techniques can resolve some of the problems. However, it is recognized that even the best of management techniques will not completely solve the motivation problem. In addition, it is recognized that the problems are not unique to transit maintenance technicians. Nevertheless, a solution specific to transit maintenance is needed.

A significant part of the motivation problem seems to stem from low self-esteem, which in many cases is reinforced by both the physical surroundings and management's attitude toward maintenance.

Solution

The workshop group called for a survey of the maintenance technician population in mass transit to clearly identify the specific nature of the problem and its causes. Currently, there is a wide range of opinion regarding the magnitude of the problem, its nature, and its causes. A professional survey would help to make the problem visible and therefore subject to investigation. This survey should also include other industries, searching for management and other related techniques to solve the problem. The project should develop a means of disseminating the information to interested parties and properties.

UPPER-LEVEL GENERAL MANAGEMENT

Problem

There was general agreement that a significant part of the human resource problem in maintenance stems from upper-level management's lack of awareness of maintenance-related variables. In the eyes of many, "upper-level" management consists of not only the general manager but also those with fiscal control and responsibility and the board of directors when it is active in the budget allocations for maintenance and maintenance training. The problem is generally manifested in inadequate budget allocations. However, there are other manifestations, such as a general lack of sensitivity to maintenance-related problems that often negates advancements made by lower-level managers. An example of this would be failure to complete a preventive maintenance task because of pressure by upper-level management to dispatch a given number of buses.

Solution

It was generally agreed that the problem of upper-level management's lack of awareness of the importance of maintenance is sufficiently great that a "one-shot" solution, such as a seminar or workshop, would not be adequate to solve the problem. In addition, there is a need to constantly reinforce the importance of maintenance and maintenance-related variables through various means of delivery. Therefore, the workshop group felt that UMTA should develop a basic package of materials that can be delivered in different modes, such as articles in journals normally read by upper-level managers, UMTA meetings including panels that require interaction between general managers and maintenance managers, and video simulation programs that would allow managers to visualize the consequences of their decisions--e.g., what happens when preventive maintenance is bypassed--and that could be introduced at transit meetings and subsequently used in regional training centers or even by individual properties. The solution should include a detailed implementation plan that can be manned by different organizations.

TRAINING PACKAGES

Problem

There is limited information on what training packages or materials have worked and/or are available. Due to the general training problem, various organizations (including individual properties, vendors, schools, and consultants) have developed training packages and materials to meet specific needs. Some have worked quite well, whereas others have not worked. Thus, merely having information about what is available will not be of much use to a training director. Information about both the accessibility and the usefulness of these materials is important to training directors of mass transit properties.

Solution

The workshop group called for UMTA sponsorship of a survey on both the availability and the usefulness of training programs, materials, and concepts. Copies of the materials should be obtained and evaluated to aid potential users. Because it is anticipated that the evaluation will take some time, it is important to provide information first about what is available and provide an update on the usefulness of the materials as they are evaluated.

COMMUNICATION AMONG TRANSIT PROPERTIES

Problem

Each transit property is faced with a multitude of problems related to maintenance and maintenance training. Many of the problems are shared by other properties, but there is no ready or effective means of communicating such information.

Solution

The workshop group saw a need for UMTA to sponsor a study to examine the common information needs of transit properties and to design a multichannel system or technique for meeting those needs.