

CONSTRUCTION LABOR MOTIVATION

**A CONSTRUCTION INDUSTRY COST
EFFECTIVENESS PROJECT REPORT**

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I

SUMMARY

Construction labor *can* be motivated. This is important because dwindling productivity is a major problem confronting construction today. Productivity has decreased every year for the past decade, in part because of increasing design complexity, more rigorous federal and state regulations and socio-economic changes affecting the work force. Our findings indicate that a highly motivated workforce enhances productivity and project effectiveness.

The changing work force in the construction industry is particularly significant. We have a very bright, well-educated and independent work force. This new work force demands reforms in the traditional rigidities of construction organization, and changes in levels of responsibility and authority, supervisory roles, communication networks, interpersonal relationships and reward systems.

It is often difficult to accentuate the positive side of worker motivation, but it is essential to eliminate the negatives, which may be more potent psychologically. Surveys at major construction projects have yielded a significant list of demotivators. The most common are: lack of material, project confusion, communication breakdowns, rework, unavailability of tools and equipment, disrespectful treatment, lack of recognition, little participation in decision making, lack of cooperation among crafts, incomplete engineering, restrictive or burdensome procedures and regulations, poorly trained foremen,¹ and restrictive work practices in labor agreements.

Our findings indicate that foremen are often unable to motivate the average craftsman today. But they also suggest that craftsmen will motivate themselves given the right conditions and opportunity. So the construction manager's role in improving the productivity of the work force on construction projects must be to make sure that supervisors at all levels are sufficiently skilled in handling subordinates that they can satisfy the craftsman's need for a sense of achievement, his wish to be wanted, and his desire to account for something. We also found a need for more direct communication between the craftsmen and site management. The chain of command in today's labor agreements, from superintendent to general foreman to foreman to pusher to craftsman, has grown too long and, on large projects, often involves too many people to let instructions get through accurately.

¹ Traditional words foremen, craftsmen, etc., include female as well as male workers.

The organization should not be so rigid as to prohibit communication that may skip intermediate links in the chain. Supervisors must be allowed, through personal contact, to help create attitudes among the construction workers that will make them want to become members of a construction team and not just nameless numbers .

Effective first-level supervision by foremen is generally considered to be prerequisite to efficient performance by any work group. They control, influence or have the greatest impact on most of the ingredients of productivity. When the potential for productivity improvement is examined, the need for more highly motivated, cost conscious and responsible foremen crops up repeatedly.²

Construction work studies and measurements of how workers use their time have been conducted to weigh the effectiveness of management and supervision. Work sampling has disclosed that as little as two to four hours per eight-hour day are spent on productive work— actual welding by welders, for example. In some cases it has been found that waiting or other idle time consumes 30% of the work day. These delays are primarily the responsibility of management and/or supervisors.

We believe motivational techniques for improving construction productivity must cover a wide field. They must include owner management, contractor supervisors, and organized labor. Productivity restraints by both management and labor also must be overcome if the worrisome decline in construction productivity is to be arrested and reversed.

A construction labor motivation program is needed. The basic requirements of the program should be:

1. A competent administrator to organize, plan, control and carry out the program.
- 2 Activities that are fully understood and acceptable to all participants.
3. Financial commitment by the owners and a willingness to recognize workers.

The program should be flexible to change with time, to maintain interest and to fit the situation on each individual project.

² The need for proper selection and training of first and second level supervision is discussed in Report C-3, "Contractor Supervision in Unionized Construction" and Report A4, "First and Second Level Supervisory Training" The Business Roundtable, 1982.

II

INTRODUCTION

Productivity in the U.S. is not keeping pace with that of many other countries. Quantity as well as quality of production has become a major area of concern for many manufacturers. The construction industry is among those faced with reports of low productivity by its work force. In nuclear power plant construction, for example, studies have revealed an annual productivity loss of 5% per year over the past decade (reference No. 33). Since construction labor amounts to an average of 25% of the direct capital costs of a project, ways and means must be found by the industry to arrest declining productivity.

Many items contribute to falling productivity, i.e., ineffective management and supervision that leaves material unavailable when it is needed, incompetence in staff personnel, delays in transmitting engineering information, communication breakdowns, rework, the unavailability of tools and equipment, lack of recognition and little participation in decision making by foremen and their crews. On the union side, restrictive work practices in collective-bargaining agreements hamper contractors' efforts to employ and deploy their labor force efficiently.³ Also in the union sector, productivity problems are worsened by the fact that foremen and general foremen are members of the same bargaining unit as the employees they supervise. This is frequently cited as a major reason why the management role of foremen is limited and often ineffective, especially on large construction projects built by transient contractors—that is, contractors who are not locally based. In these situations, the motivation and actions of foremen often conflict with management's efforts to improve productivity.

One area for concern in this multi-faceted problem is worker motivation. Construction workers seem to take less pride in their work than was true in past years. The work ethic seems to have weakened considerably, possibly because of social welfare programs, unemployment benefits or, at least in some years, economic prosperity.

The nature of construction work also may have changed in recent years to reduce worker morale. During the 70's, the increasing number of "super projects" involving high technology brought new

³ See Report C-4, "Constraints Imposed by Collective Bargaining Agreements", The Business Roundtable, 1982.

management problems. Some workers, suddenly found themselves in work environments they did not understand, some work took on the appearance of repetitive factory-type labor. Workers might be employed for years on a single project, though they might prefer more mobility and more variety. In any case, a lack of worker motivation appears to be a factor in reduced productivity, increased absenteeism, and increased turnover.

A study team was formed and asked to do two things: 1) develop a better understanding of what motivates construction workers, and 2) devise specific programs that can be used on construction job sites to enhance efficiency and productivity.

III

HOW STUDY WAS MADE

This study focuses on the most common demotivators and on techniques that increased productivity through improved motivation.

Since many studies on this topic have already been published, the study team decided further field research would largely duplicate what is already available. A contract was given to the University of Texas to conduct a literature review of motivational subjects which could be used to improve construction productivity. Under the terms of the contract, Dr. John D. Borcharding, University of Texas, along with Dr. Jimmie M. Hinze, University of Missouri, performed a search for relevant articles and other reports covering motivation techniques both inside and outside the construction industry. They took special pains to identify methods used in other industries—but not in construction—as a possible source of new ideas to motivate construction workers. The considerable experience of the study team members in this field naturally shaped the findings.

IV

FINDINGS

Although some unique motivational programs were found, the vast majority can be grouped into five primary categories: goal setting, incentives, positive reinforcement (i.e., recognition for a job well done), worker participation, and work facilitation. The following presents a dissertation on each of the five categories discussing first their use in other industries and then their application to construction.

Goal Setting

In Other Industries: A successful program begins with a carefully established goal. Goals should be set at a high but attainable level because low ones lead to low performance. If the chance of falling short of the goal is high, the goal may provide no incentive to perform. Naturally, workers must accept a goal in order to be moved by it. Acceptance is more probable if workers participate with management in establishing it. The goal should be specific and the measure of performance should be linked directly to it. It is imperative that all workers be treated fairly in the setting of goals.

Monitoring worker performance in relation to the goal is important; workers need to hear how they are performing. Some companies post information on the current results of production. Many feel that such a feedback arrangement prompts workers to set new goals for themselves. Feedback may also foster competition between workers.

One reason cited for the success of goal setting programs is that the goals give workers direction. They know what is expected of them and as a result have a clearer focus on what has to be done. One study showed that the presence of a supervisor adds to the clarity of focus.

Why do workers strive to attain goals? Tangible rewards such as bonuses, time off, etc., are obvious reasons. But if such rewards are to motivate, they must be regarded as valuable or desirable by workers. Some authorities contend that rewards or incentives do not motivate by themselves without the existence of goals. Oddly enough, the converse is not true: many goal setting programs have succeeded in the absence of incentive pay or other tangible rewards. As a result some researchers consider that bonuses are not very important.

Goal setting can also be viewed as an integrated version of all the major motivational techniques. Goal attainment may lead to tangible rewards or reward in the form of recognition (positive reinforcement). The establishment of meaningful goals frequently uses another element—worker participation.

In the Construction Industry: The best way to set goals is for management to agree on attainable targets, based on the best historical performance for both quality and productivity. Unfortunately, few studies have been published about construction firms that have used this technique. But the following two examples suggest some advantages of goal setting in construction projects:

Sixty 17- to 23-year-olds were hired to work individually on a two-hour construction task. They were assigned to one of two pay conditions (piece-rate or hourly) and one of three goal setting conditions (no goal, quantity or quality). As expected, the method of payment was found to affect quantity performance and effort; goal setting affected quantity and quality performance and direction of behavior (see reference No. 26 in appendix).

Individual goals may be meshed with organizational goals through such rewards as money, promotion, work environment, praise or recognition. Yeargin Construction Company of Greenville, South Carolina, used company goal setting to encourage new and higher working standards among its employees. The philosophy was: "What's good for our customer is good for us". New construction jobs secured by Yeargin meant more work for its employees (reference No. 32).

Incentives

In Other Industries: Incentives are usually defined as tangible rewards that are given to those who perform at a given level. Such rewards may be available to workers, supervisors, or top managers. Whether the incentive is linked directly to such items as safety, quality or absenteeism, the reward follows successful performance.

Many companies feel that pocket money is no longer a good motivator. Others contend that small rewards such as toasters and blenders do not motivate. Many companies therefore offer profit-sharing plans or bonuses that may increase the annual pay of a worker by 25% or more. Still other companies have abandoned monetary rewards and instead offer lavish trips to such places as Europe and some Caribbean islands. Because of the expense, these programs require careful monitoring. Some companies merely reward good producers with an extra day off with pay. Other concerns reward top performers with better working conditions.

Since incentive programs aim to increase workers' performance levels, the measure used to decide if a reward has been earned should be carefully set. The performance level must be attainable or workers won't try to reach the goal. That fact underscores the usefulness of having workers themselves contribute their ideas about what constitutes a reasonable level of performance.

Despite fairly wide use of incentives, some common pitfalls persist. One involves incentives tied to a level of output in which inputs are ignored. For example, a worker in a prefabrication shop may increase his output of widgets (to gain a reward) at the expense of wasting more material. An incentive scheme may also fail if the measure of success ignores quality or safety. An obvious problem exists when an incentive is applied to work that is machine paced. Incentives should be clearly linked to performance, but not all incentives can be clearly tied to objective criteria. Some incentive rewards are issued on the basis of a subjective assessment by a superior on the merit of particular workers. This method, in particular, may alienate workers who do not win rewards.

In the Construction Industry: Profit sharing appears to be the most frequent type of incentive program among construction companies. But the effectiveness of company-wide incentive systems is virtually impossible to determine. A University of Texas study issued in 1980 pointed out two drawbacks inherent in profit-sharing programs: 1) profit is controlled more by outside than inside forces, and 2) such rewards are irregular and infrequent (reference No. 19)

Worker Participation

In Other Industries: Worker participation has been hailed by many companies as a successful way to boost productivity. The consensus is that active involvement in managerial decisions gives workers stronger feelings of loyalty to a firm. Almost any changes that affect the working conditions of workers are apt to be more readily accepted if the workers have been consulted in advance in more than a perfunctory way .

Worker participation is not only widely used, but has several forms. The most common method is the suggestion box whereby workers write suggestions on a piece of paper for management review. If the suggestion is adopted, the worker is commonly given a part (often 10%) of the resulting first year's savings. This system has many known successes, but it is not without problems. For example, the repeated rejection of a worker's ideas will eventually damage his self-esteem; jealousy may result if one worker receives a cash bonus; a foreman may resent a

subordinate who comes up with good ideas; labor unions may resist some suggestions on the grounds that they may eliminate jobs. It is also possible that savings in one work unit may cause added expenses for another. If a top reward is too large, a worker may abandon (or curtail) his ordinary work effort in hopes of coming up with a suggestion box bonanza.

The Scanlon Plan is more comprehensive. It is based on mutual labor-management sharing of goals, problems and ideas. It places considerable responsibility on management to make sure that labor is adequately informed about internal matters so meaningful proposals for changes can be made. The plan is carried out through labor-management committees which evaluate suggestions that are then sent to management for *all* workers.

A more sophisticated arrangement for tapping worker creativity is quality control circles, or more simply, quality circles. These are work-management programs that function through labor-management committees (the quality circles), thus enabling workers to effect their own work environment. This may be the most effective way yet devised to tap worker creativity and improve both job satisfaction and productivity. Goals are set by senior management but the path to reach those goals is defined by consensus, starting at the bottom of the organization.

Quality circles come with several variations. Volvo, the Swedish automaker, is well known for letting workers set their own pace, encouraging worker suggestions, and using job rotation to reduce monotony. A similar plan in Britain (Imperial Chemical Industries) encourages workers' suggestions, lets workers plan their own work and has even resulted in the elimination of jurisdictional disputes.

Another form of worker participation is regular monthly meetings between rank-and-file workers and top managers. These meetings are usually conducted by an outside consultant, because it has been discovered that some workers feel uncomfortable with the "big boss" at the podium.

Some worker participation programs try to eliminate traditional attitudes about worker classes. Rushton Mining, a coal mining operation in Pennsylvania, lets its workers handle matters involving productivity and grievances, while foremen are in charge of safety. Workers were all paid the same high wage regardless of seniority or classification. Job rotation was freely accommodated. Company profits and workers wages rose with this system. Similarly, a dog food

plant operated successfully in Kansas with minimal supervision of its workers. The workers made their own job assignments, set their own coffee breaks, interviewed prospective employees and voted on raises for workers. Indeed, several companies let their workers be involved in setting wages. Roman Company, in the state of Washington, has used a system whereby if a worker announces a desire for a raise fellow workers observe the work performance for a week or so and vote whether to give the raise. Success has been noted with this plan, but some critics feel the outcome of votes on pay increases hinges more on personality than merit.

In the plans reviewed, we found many and varied benefits. Workers who are actively involved in decisions that affect them are more receptive to change, work harder as they develop more enthusiasm, become more loyal to the employer, do not suffer from job alienation, experience greater job satisfaction, and show increased morale and creativity. Employers benefit from better worker-management relations, increased productivity and increased profits. This atmosphere of participation, of course, is also needed in engineering and management teams.

In the Construction Industry: We endorse structured work-management programs through labor-management committees or quality circles, because they let workers identify and *solve* work problems. Quality circles programs lead, among other things, to cost-saving ideas, more job satisfaction, a more cohesive work unit, and improved quality control (references 23 and 24).

Writing in the American Society of Civil Engineers' *Construction Journal* (reference No. 6), John D. Borcharding, a consultant to this study team, notes that construction may be the only Industry where participative decision making should occur naturally because of the challenge of the work environment. Foremen have to make many day-to-day decisions; they must also participate with project management in establishing such jobsite policies as coffee breaks and crew sizes. Journeymen have an opportunity to participate in method selecting decisions and help to mesh the work done by different trades.

Construction Contracting magazine reported in 1979 (reference No. 13) that more than 50% of the work force believes it has a right to share in decision making about issues that affect them. In a recent productivity improvement survey of more than 500 managers, employee participation programs were ranked as the most effective way to boost productivity in construction (reference No. 31).

Positive Reinforcement

In Other Industries: Positive reinforcement is also known as behavior modification, where desired behavior is rewarded. In most plans, the rewards consist of praise and compliments from supervisors. Naturally, this does not cost the company money—except for whatever is required to train supervisors to remember that a pat on the back, when deserved, should not be forgotten. There are numerous cases where such homely praise has brought improved productivity and reduced absenteeism.

Positive reinforcement programs stress only the positive aspects of behavior. In theory, negative or undesired behavior should not bring threats or punishment. The idea is that workers yearn for signs of approval from their supervisors and will change their behavior in order to receive it. Positive reinforcement programs generally include elements of work measurement, management-by-objective, and productivity improvement, as well.

Some critics contend positive reinforcement is manipulative and therefore demeaning. Others argue that workers will distrust a system that is manipulative; distrust, of course, would hinder the program. Other critics feel that praise alone will not motivate all workers. So some advocates of positive reinforcement suggest that other rewards also be added. If verbal praise becomes a frequent event, its impact naturally diminishes over time. Supplementing praise with other rewards such as better job assignments, public recognition (awards at dinners), private recognition (personal letters), and time off with pay adds strength to the technique.

Many companies have had successful experience with positive reinforcement, though the programs vary considerably from company to company. It is not clear that verbal praise alone for good performance will have a long range success record. Embellishments appear to increase the likelihood of success.

In the Construction Industry: On average, craftsmen receive little or no recognition for their efforts (reference No. 19). But studies based on extensive interviews indicate that it is very important for workers to know that management formally recognizes their work and especially that management appreciates extraordinary efforts (reference No. 12).

Non-monetary recognition appears to be more effective than financial incentives for construction, because of the many difficulties associated with the latter, notably, of course, union objections.

There appear to be only a few existing monetary incentive programs, mostly in residential construction. Non-monetary programs can include craftsman-of-the month awards. Individuals or crews can be recognized for outstanding quality and productivity by commendation letters or stickers - a subtle form of adult merit badge (reference No. 2). An entire project can be recognized by banners, posters or newsletter articles aimed at instilling a sense of pride in the job.

Construction executives should reconsider motivational programs that recognize extra effort and resolve problems that lower productivity. The key elements of current construction management motivations include: 1) improved management efficiency and effectiveness, 2) eliminating demotivators and minimizing productivity constraints, 3) more planning and training, 4) improved communication through newsletters, poster, meetings, etc., 5) recognition, awards and monetary incentives (references No. 15, 18, 24, 28). Some craftsmen may be less concerned about the dollar value of an award than with the visibility and prestige it confers.

Work Facilitation

In Other Industries: Published literature on this topic of motivation does not clearly fit into the previously described categories. By reviewing some of the techniques listed below it can be concluded that worker facilitation seems to be a strong factor in worker motivation.

1. The employer should show a greater trust of employees.
2. Job content should be improved.
3. Work should be made more interesting.
4. Workers should be educated about the need for productivity and the importance of profit if a company is to offer continuing or repeated employment.
5. Pay should be increased as a worker's skills improve.
6. Employers should be strict about enforcing performance requirements.
7. Workers should feel good about the employer.
8. There should be no artificial barriers to communication between workers and management.
9. Workers should be given authority to work on their own time.
10. Salary reviews should be held irregularly to stimulate enthusiasm; regular raises tend to be taken for granted.
11. Workers should be kept appraised of the performance levels of other workers, because such work crews tend to compete.

12. Workers should be able to have a sense of contribution to the final product.
13. Employers should provide company sponsored recreation.
14. Work units should be as small as possible.
15. Employer groups and unions should restructure bargaining agreements so that some restrictions to worker productivity can be eliminated.

In the Construction Industry: Construction workers can best be motivated through the satisfactions inherent in construction work itself (reference No. 14). Dissatisfaction must be eased before any added motivators become effective because an individual construction worker will not be motivated if he is strongly dissatisfied (reference No. 5).

For journeymen and apprentices, managerial insistence on good workmanship should provide considerable motivation. Though a productive day may leave some workers physically exhausted, there are offsetting benefits such as good social relations on the job. Demotivation is caused by strained interpersonal relationships among crew members and unfair job assignments, and usually result in a poor work performance.

Job motivators for foremen should include the challenge of running the work, maintaining the job schedule, good workmanship, the physical taking shape, and good work relationships within a crew (reference No. 22). Job demotivators would include uncooperative workmen, union problems, lack of initiative in workmen, lack of management support (i.e., absence of engineering information or the timely availability of materials and equipment) (reference No. 5).

General Motivation Techniques In Construction

The key to motivating construction craftsmen and foremen appears to be organizing the project and its resources to let individuals be productive. More than anything else, this promotes job satisfaction and provides an incentive for individuals to increase their productivity.

One of the most important perceptions for management in devising ways to hitch worker motivation to improved productivity is to understand that a lot of items if mishandled can produce

the opposite result from that intended (reference No. 16). Consider safety and project planning, for example, both generally regarded as motivating forces. Handled poorly, however, they can turn into demotivators. A Department of Energy study, published in 1978 by the University of Texas (reference No. 12) points up these possibilities. Based on questionnaires and interviews with more than 1,000 craftsmen at 12 large industrial construction projects, the study identified 11 motivators and 17 demotivators. Safety and project planning could be either a plus or a minus, depending on how well they were carried out. Some projects had a poor safety program and in some the job was not well planned, so these potential motivators turned into demotivators (see Tables 1 and 2).

TABLE 1
Survey Results of Motivators on Twelve Construction Projects

MOTIVATORS	PROJECTS											
	A	B	C	D	E	F	G	H	I	J	K	L
Good craft relations			1*			2	2		1	1		
Good orientation program	3	3	1		1	1	1	2				2
Good safety program		1*	1	1*	2*	3		2*	2			
Work itself	2		2	2	2		3		2			2
Overtime					3		3					
Pay			2	1	1	2	2	2	2		2	2
Recognition				1*	1*							
Goals defined			1	1	1		1					
Open house & project tour	2	1		2								
Well-planned project						2*	2*	1*				
Suggestions solicited			1*		1*	1		2*	1			

KEY: 1 = somewhat important * = demotivator and motivator
 2 = major importance
 3 = extremely important

TABLE 2
Survey Results of Demotivators in Twelve Construction Projects

DEMOTIVATORS	PROJECTS											
	A	B	C	D	E	F	G	H	I	J	K	L
Disrespectful treatment		3	3	2		1			3	3		2
Little accomplishment			1		2					2		
Material availability	2	2	2		3	1	1	2	1	2	1	2
Tool availability	2	1	2		2			1	1	1	1	2
Redoing work	1	1	1	1	1				1	1	2	2
Crew discontinuity	1		2		1		2					2
Project confusion	1	1	1	1	1	1	1	1	1	1	1	1
Lack of recognition	2	2		1*	1*		1	1			1	
Productivity urged but no one cares	1	1	1								2	2
Ineffective utilization of skills	1	1					2	1			2	
Incompetent personnel	1	1	1	1	1		1	1	2	2	2	2
Lack of cooperation among crafts	1		1*					1			3	3
Overcrowding		1			1							
Poor inspection programs		1		1					1	1		
Communications breakdown	1	1	1	1	1	1		2	2	2	2	2
Unsafe conditions	1	1*		1*	2*		2	1*		2		2
Lack of participation in decision making	1	1	2*	1	1*			1				

KEY 1 = somewhat important * = demotivator and motivator
 2= major importance
 3= extremely important

The study underscores the crucial importance of eliminating the negative—that is, demotivators. Motivators such as the work itself or clearly defined goals are less effective when such negatives as disrespectful treatment or unavailability of materials, tools and equipment are present. On the other hand, even when no specific motivators are provided, but when these demotivators are eliminated, workers fall into a more productive routine. When both sets of needs are met, workers feel that their jobs are challenging and important and generally are prompted toward higher productivity (reference No. 12 and No. 20).

Communication

The role of communications in construction is especially critical. If you cannot communicate with the worker, you can't do much to change his work attitudes. Of the eleven "motivating factors" I listed in the Department of Energy study of motivation and productivity of craftsmen and foremen on large projects, six are essentially matters of communication: 1) good working relationships among crafts, 2) an adequate orientation program, 3) a good safety program, 4) recognition, 5) goals defined, and 6) suggestion solicitation. Of 17 "demotivating factors" listed, six involve a lack of communication: 1) disrespectful treatment, 2) project confusion, 3) lack of recognition, 4) lack of cooperation among crafts, 5) communication breakdown, and 6) no participation in decision making.

Numerous forms of communication — newsletters, questionnaires and interviews, and quality circles have been used in recent years to improve communications with craftsmen. Formalized feedback systems such as the Foreman Delay Survey (see Table 3), give management a chance to evaluate its own performance, identify problems, discuss solutions, and take steps to keep the job within the budget and schedule. Simply stated, the Foreman Delay Survey is a daily account of problems that create delays in the work and which the foreman may not be able to directly control.

Training

A firm's greatest asset is its people. Training is one key to superior performance (reference No. 8). Training can increase productivity, morale, reduce the load on supervisors, improve safety, increase organizational stability and flexibility (reference No. 10).

In developing highly qualified people, it helps to offer vocational and supervisory training facilities, especially when free tuition or greater promotional opportunities are offered to workers and foremen who enroll.

**TABLE 3
Foreman Delay Survey**

CRAFT:

NAME OF FOREMAN:

GENERAL FOREMAN:

(DATE) DAILY EVALUATION:

NUMBER IN CREW:

PROBLEMS CAUSING DELAY

	MANHOURS LOST		
	Number of Hours	X	Number of Men = Manhours
1.a Waiting for materials (warehouse)	_____		_____
1.b Waiting for materials (not received or not ordered)	_____		_____
2. Waiting for tools or tools not available	_____		_____
3. Waiting for equipment	_____		_____
4. Equipment breakdowns	_____		_____
5.a Changes/redone work (design errors)	_____		_____
5.b Changes/redone work (prefabrication errors)	_____		_____
5.c Changes/redone work (field errors)	_____		_____
6. Move to other work area	_____		_____
7. Waiting for information	_____		_____
8. Interference with other crews	_____		_____
9. Overcrowded working areas	_____		_____
10. Plant coordination/authorizations	_____		_____
11. Other _____	_____		_____
_____	_____		_____

COMMENTS: _____

Elements of Work Itself

In construction, the work itself—that is, the building of a structure for all to behold is a key motivator for all levels of management and the work force. Therefore, a well planned project seems to be the first — and most important — step to achieve good productivity. Unfortunately, on large industrial projects, craftsmen often receive only minimal amounts of information about their work. Duplication of effort, numerous modifications to plans, and schedules that consistently slip make it difficult to maintain a motivated workforce. On large power plant projects, changes in design and problems with material availability are considered the major demotivating factors (reference No. 12).

With effective pre-planning, the availability of materials will be checked before workers are assigned to an area so workers do not start in one location only to have to be shifted to another location. Care in this respect should improve worker motivation and productivity and help promote a high level of accomplishment.

Most foremen and craftsmen take considerable pride in the work they do. Having to rip out their work and redo it can be extremely discomfoting. In fact, if it is extensive, redoing parts of a project may be the worst demotivator of all.

Craftsmen view overcrowded conditions and crew interference due to extensive rework as demotivating. Worse, such problems can create hostile feelings as a result of the frustration. Design standardization can help to minimize rework and improve morale (reference No. 12).

Organizational Structure of a Project

Many projects are short lived and involve only a few levels of management in their hierarchy. But on large and lengthy projects, deep hierarchical structures can create communication problems that may demotivate the work force (reference No. 3).

The larger the project, the narrower the responsibility of foremen. Decision making is thus pushed upward in the hierarchy and may eventually cause some communication and motivation problems (reference No. 4). Samelson and Borcharding's study of motivating foremen on large construction projects supports this conclusion by indicating several barriers that arise from the size and complexity of projects, and which are regarded as demotivators by foremen (reference No. 22).

Large construction projects usually lack intrinsic motivators for the workers such as a feeling of accomplishment, and understanding of the work itself. Workers feel they are small cogs in a big wheel, treated as mere numbers (reference No. 12). Most lengthy projects are more complex than

brief projects. This complexity also reduces satisfaction because individuals feel less identification with the total job (reference No. 1) . Given the depersonalized character of large projects and narrow work assignments, efforts at motivation must be intensified. The creation of formal motivation programs is frequently justified for projects even smaller in scope.

Social Activities

Social activities can help overcome demotivation because of the lack of identification on projects. Involving families on a project tour is a useful motivational tool which increases the pride of craftsmen in their work. A dinner for selected awardees is a very effective way to give recognition to the work force (references No. 15 and No. 28). Sports teams, project manager luncheons, or fishing trips can be good techniques to develop more harmonious relationships between management, supervisors, and the work force.

Extended Work Hours

When engineering is not progressing fast enough to let construction proceed on schedule, many demotivators are apt to plague on-site work. Engineering drives the schedule and is the key to materials procurement. So any delays can cause lost time for much of the work force. Improving the flow of engineering to a project can have a very positive effect on worker motivation . Where overtime me is required for engineering work in the office, the most productive plan is ten hour days, if they are limited to no more than eight days in a row (reference No .11) .

In construction, three alternatives to five regular 8-hour days per week could be considered for improving motivation and productivity. One is a work week of four 10-hour days without overtime (reference No. 25). Ival R. Cianchette, the 1980 President of the Associated General Contractors, said four work days of 10 hours each would lower daily start up costs, reduce equipment down-time, speed project completion, help level out peak manpower loads, reduce absenteeism and tardiness, cut the number of days lost due to bad weather, and reduce the amount of energy workers consume in commuting to work. Many open shop companies perform virtually all their projects on this four-ten schedule. They have found four-tens "extremely effective and successful" with improved moral, increased productivity, and reduced absenteeism and turnover (reference No. 25).

A second alternative is flexible working hours. For example, if the work force completes a major portion of the work ahead of schedule, they would receive time off in recognition of their extra effort. Allowing craftsmen time off leaves them free to pursue other activities during their bonus time (reference No. 9). One large plumbing contractor has used an incentive arrangement under which each worker was responsible for a certain amount of output per day; when he reached that amount, he was free to go home and would still be paid for an 8-hour day (reference No. 29). Finally, rolling four-tens dovetailed into a project operating 7 days a week may be the most feasible of the work week schedules that are also significant motivators and which attract craftsmen, while at the same time, reduces on-site population and cuts overall construction time and equipment requirements. Executives at the Riverbend Nuclear Project report that the work force there is very supportive of this arrangement.

Union Influences

In an *Engineering News Record* special report, 23 formerly unionized companies indicated that union wage and fringe benefit rates had troubled them most. But, many explained that the problem was not the wage itself, but rather, that pay was not based on merit and did not vary with the skills and motivation of the individual. Journeymen interviewed by ENR agreed that when working union, there is no incentive to work harder than others who cannot, or will not, work as hard (reference No. 27).

Pickets, for whatever reason, are extremely expensive for management. The owner loses whether an extended strike results or not. Contractors may schedule work in a less efficient manner to avoid picketing problems (reference No. 26). Many tradesmen, on the other hand, put a high value on their union experience, especially the training. Union contractors can set up labor-management committees to improve productivity and publicize the advantage of union construction (reference No. 27).

Safety Considerations

If top level management expresses strong concern for project safety, this can be a motivator for workmen. Potential savings on insurance rates should reinforce a moral obligation by management to provide a safe work environment. Well-kept, safe areas and a display of management concern for the well being of their employees may move craftsmen and foremen to perform more productively. Conversely, unsafe conditions and unnecessary injuries can result in decreased worker morale and high absenteeism and turnover (reference No. 12).⁴

⁴ This subject is discussed in Report A-3, "*Improving Construction Safety Performance*", The Business Roundtable, 1982.

Safety incentive programs in which foremen are rewarded for the safety record of their crews have proved to be very helpful in improving the morale of both supervisory and non-supervisory men on the job (reference No. 21). Other significant motivators include proper orientation of new workers, job safety meetings, and a show of awareness by the superintendent of potential problems that may result in an accident (reference No. 17). Safety instruction and safety equipment such as steel-toed boots, gloves, or safety glasses reduce the likelihood of injuries. All of these, too, can be motivators.

Absenteeism and Turnover

The Department of Energy study (reference No. 12) indicated that the absenteeism and turnover are a relatively minor concern to workmen. Still, they can have a major impact on total project productivity. High rates of absenteeism are a concern, however, to individuals who had to carry extra work loads to compensate for missing crew members (reference No. 7).

B.L. Whyte found that low job satisfaction resulted in high absence from work and high turnover (reference No. 30). Thus absenteeism and turnover can be viewed as effects of motivational activities or demotivational concerns. The cost of motivational programs is often justified by the reduced absenteeism and turnover. For example, the cost of Fisk Engineering and Construction's Big Cat Program On eight projects has been more than paid for by the reduction in absenteeism and the reduced costs associated with hiring fewer workmen. David Weatherford, program director, indicated that it required \$500 per employee to process paper work plus two to three weeks of each new employee's time to learn the job. Again, the figures on attendance and turnover measure the motivational effort that is financially justified. Moreover, awards for good records are perhaps the most effective method to decrease absenteeism or turnover.⁵

V

CONCLUSIONS

Five general motivational techniques — goal setting, incentives, work facilitation, positive reinforcement, and worker participation — have been widely used to increase productivity. Most of them seem to be applicable to manufacturing and construction. Of the five, goal setting is

⁵ This subject is discussed in Report C-6. "Absenteeism and Turnover", The Business Roundtable, 1982.

perhaps the least used technique in construction. Ingenuity in adapting the principles of goal setting to the construction industry may prove very rewarding. The use of incentives, such as financial incentives, in the construction industry is also limited. Although incentives are known to exist in the open-shop sector, as a general rule, unions have opposed the use of this technique.

All motivational techniques applied successfully in manufacturing are not necessarily effective in construction. The construction industry is different; the differences should be recognized. Construction workers get job satisfaction from seeing their efforts produce permanent structures. Assembly-line workers, in contrast, do not generally feel much if any identity with the resulting product. This makes construction workers easier to motivate in one marvelous way: facilitating work is a strong motivator. A construction worker will often be highly motivated if he gets proper instruction, equipment, tools and materials to do his job properly. On the other hand, if the work is not well planned or if its progress is interrupted by lack of essential tools or materials, a worker not only may cease to be motivated but may turn 180 degrees and be demotivated. It is essential that construction workers be permitted to accomplish their work without avoidable hindrances.

Positive reinforcement, which should always be used, is probably the least expensive motivational method available. It recognizes that the workers have egos and that "feeding" those egos can provide very beneficial results. More simply, a pat on the back from a supervisor can have a big payoff.

Worker participation in plans for the detailed execution of construction projects are exceedingly important for optimum performance. Some worker suggestions may fail to recognize the potential overall impact of the suggestions on the entire project, but all ideas presented to management should be given thoughtful consideration.

An evaluation of four motivational programs (see Table 4) successfully aimed at improving construction productivity shows there are many routes to the goal. If the programs have a common flaw, it appears to be too little stress on eliminating constraints and demotivators. Such efforts should be an integral part of all motivational programs (references No. 15, 18, 24, and 28).

TABLE 4

Evaluation of Four Successful Productivity Improvement Programs

Categories	"SCAT-CAT"*	"Tops"*	"Powerful* Producer"	" Super-Bee"*
Scope of Program	Narrow topic: design standards.	Maximize innovative thinking.	Attendance, performance, safety.	Broad approach: total project problem-solving.
Evaluation of Effectiveness	Best due to narrowly defined program	Result - oriented, Well defined.	Difficult due to big size of job.	Not individual performance-oriented.
Awards	Simple, inexpensive, but effective			
	Competitive nominal awards to everybody who attended the meeting		Competitive awards based on attendance and productivity.	Not award oriented.
Training	Specific training targeted on well-defined scope.	Minimal training Maximum utilization of existing resources.	Some training involved.	Maximized formal training program.
Union or open shop	Open	Open	Union	Open
Key new techniques	Manuals made for crafts.	Evaluation of good suggestions. Foreman delay surveys.	Foreman evaluation of craftsman's effort.	Quality circles timelapse, foreman delay surveys, questionnaires & interviews.
Structure	Remove demotivators by changing worker attitudes and using awards.			Method improvement training and timelapse.
Uniqueness	Situation of training needed for design standards.	Suggestion system	Positively accentuated	Adhered to concept of participate decision-making.
Reason for success	Technical aspects in the programs's design and the awards were linked directly to the performance of craftsmen and foremen.			
Weakness	Not sufficient in themselves because different construction projects have a different environment and measurement is a problem.			
Recommendations	1) Objectives have to be stated specifically, written down, and be flexible. 2) More effort should be aimed at solving problems that adversely affect production because this is a key motivator of worker's attitudes and thus affects productivity.			

*Names used by contractors and owners to identify special motivation programs on individual construction projects

To sum up:

1. A motivated work force can exert major influence on the success of a project.
2. A sufficient supply of information, equipment, tools, materials, energy and space as a result of detailed planning for the needs of every crew are crucial factors in the smooth performance of work. They also have a major influence on the motivation of both craftsmen and foremen.
3. Creating a satisfying environment through adequate safety facilities, effective organization and even social activities will increase morale among workers.
4. Necessary training, proper recognition, and appropriate communication will help to give a work force higher skills and develop good will to do a better job.
5. Participative decision making through quality circles is probably the most effective single method yet devised to improve the motivation of craftsmen and foremen beyond what would normally be accomplished on a well managed project.
6. Well defined productivity improvement programs should be developed for large projects to increase morale and allow more work to be accomplished.⁶
7. Efforts to minimize labor turnover and absenteeism on the job help to maximize labor productivity.
8. The psychological effect of well managed job sites is one of the most significant contributors to high productivity.
9. Where appropriate, consideration should be given to such ideas as flexible working hours and rolling work weeks of four tenhour days.
10. Financial incentive programs should be approached with great caution, considering the variability in the construction environment and difficulty of measuring worker performance.

To carry out a successful labor motivation program, the following ingredients are important:

1. **Management Involvement:** The site management, including both owner and contractor supervisors, must be completely supportive, enthusiastic, and understanding of the motivation program .
2. **Demotivators** should be identified and corrected as soon as possible. The Foreman Delay Survey (see page 16 and Table 3) is a valuable tool—for spotting many of the time wasting mistakes that can sap workers' spirit. Successful results have been achieved with

⁶ See Report A-1, “*Measuring Productivity in Construction*”, The Business Roundtable, 1982.

the FDS by having the foreman fill out the form each day for one week per month; the task usually requires only about 5 or 10 minutes per day. Feedback and management action is required to maintain the effectiveness of a Foreman Delay Survey.

3. **Organization:** The program should have an individual identified as its administrator. A permanent steering committee should help to maintain the program's direction and effectiveness. Consultants from the behavioral sciences field may be used effectively in planning and carrying out programs.
4. **Foreman Training** in job planning, scheduling and motivation should be considered. The attitudes of workers are greatly influenced by the effectiveness of their foremen, who, in many instances, were outstanding craftsmen but may have had limited training in managerial techniques.
5. **Communication:** Open and effective communication is essential for a successful motivation program. Besides oral communication, newsletters, bulletin boards, etc., have proved effective and should be used.
6. **Recognition:** Good work should be recognized and receive suitable publicity, or other public show of appreciation.

VI

RECOMMENDATIONS

It is fully recognized that contractors have the primary responsibility for the execution of onsite work activities of their craftsmen. Owners, on the other hand, have a self interest in these matters because of the direct effect on the cost of these activities. The following recommendations establish the basic role of owners and contractors in order to obtain a cost effective construction labor motivation program.

For Owner Action:

1. Enthusiastically support a labor motivation program. Provide site management supportive of motivation concept principles.
2. Assist in eliminating demotivation items such as late design, design changes, work environment, etc.
3. Establish clear, open and effective communication systems to the project.
4. Provide representation on the site motivation steering committee.
5. Provide opportunities for recognition for efficient work practices.

6. Insist on and/or provide good working conditions.
7. Insist on and support an effective safety program.
8. Consider the use of consultants to assist in program development and implementation.

For Contractor Action:

1. Implement a construction labor motivation program and provide site management supportive of motivation concept principles.
2. Establish a steering committee.
3. Effectively choose and train first and second level supervision .
4. Incorporate the use of the Foreman Delay Survey (Table 3) concept to identify those demotivators affecting the workforce. After identifying demotivators, the contractor should diligently pursue opportunities for eliminating the demotivators and provide feedback information to the foremen and crew.
5. Provide open communication lines. Consider project orientation, newsletters, suggestion boxes, bulletin boards, etc.
6. Provide and maintain good working conditions.
7. Establish an effective safety program.
8. Formally recognize efficient work practices.

VIII

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