Final Report

EVALUATION

OF

MORALE AND PRODUCTIVITY

AT

THE WATTS BAR NUCLEAR PLANT
(Tennessee Valley Authority)

Presented
by

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INTRODUCTION

Overview

The present report (following Post-test 2) presents the status of attitudes and beliefs at Watts Bar Nuclear Plant after implementation of the planned intervention was reported as being completed. It serves as the final report, and provides information about the current situation as well as about comparisons with the Pretest Diagnostic Survey and the Post-test 1 Survey.

The Introduction will consist of a brief review of a) the total program to improve communication up to the time of Post-test 1; b) results of Post-test 1 and comparison with the Pretest Diagnostic Survey; and c) both planned and unplanned changes at Watts Bar since our initial contact with the situation. The Results and Discussion section will then present the Post-test 2 results, comparisons of the Pretest results with the Post-test 1 and Post-test 2 results, and a discussion of those results.

Program to Improve Communication.

The conditions at Watts Bar Nuclear Plant in the summer of 1981, as reported by TVA management to Patricia Smith of the Bowling Green Industrial Relations Center and Robert Dunbar of the MacDonald Motivational Research Center, included several factors which management considered highly undesirable. Morale was low; productivity was behind schedule; turnover was increasing, especially among technical and engineering personnel; and the atmosphere of trust in management and pride in TVA which had reportedly prevailed in earlier years seemed "to have been replaced by mistrust and lack of identification with organization" (Diagnostic Evaluation Report, pp. 1-2).

We submitted a proposal, accepted by TVA, suggesting the administration of three surveys, a pretest and two post-tests. Thus, after identifying the relevant question areas through semi-structured interviews, the first of the three surveys was administered (see Appendix C of the Diagnostic Evaluation Report) to provide the information needed to propose an appropriate intervention. The Diagnostic Survey was completed in July and August of 1981.

As we indicated in the Diagnostic Evaluation Report and the Progress Report, three groups of variables must be considered in analyzing a complex personnel system: Input, Outcome, and Mediating Variables (Personal Characteristics) (see Figure 1 for schematic

outline of variables included in the study of WBNP). "The characteristics of the job, the supervision, the reward system (including the supervision, etc.) can be considered as Inputs into the situation. The individual's behaviors can be considered as Outputs. The feelings and hopes of the individual must also be considered as Outputs. All such results can be called Outcomes. Certain specific characteristics of the individual mediate the relationships between the Inputs and the Outcomes, and therefore may alter their relationships to each other" (Diagnostic Evaluation Report, pp.1-3). The Input Variables are potentially under the control of TVA; in contrast, the Mediating Variables are independent of any control by TVA, and the Outcome Variables can be changed only by changing the Inputs.

In summary, analyses of the interrelationships between Input and Outcome Variables from the Pretest Diagnostic Survey indicated that there was clear evidence of inadequate feedback and recognition of performance, and limited definition of what was expected on the job, (For a complete discussion of the Diagnostic Pretest results, see Diagnostic Evaluation Report.) Since each of these Input Variables could be improved by a single communication system involving recording and evaluating performance, a modified Behaviorally Anchored Rating Scale (BARS) system was recommended as an intervention.

The intervention was described in detail in the Progress Report. Briefly, the first part of the intervention involved (1) supervisors observing and recording specific job-related behavior on Behavioral Observation Note Entries (BONEs), and (2) supervisors evaluating and discussing each BONE with the employee soon after the observation. At the time of Post-test 1, the first part of the intervention involving BONEs training for supervisors had been implemented. Supervisors, however, had not as yet been exposed to BARS in relationship to BONEs and were not generally aware of the relevance of BONEs to effective recognition of performance. They viewed BONEs as a complete system rather than as a <u>step</u> in achieving better observation and communication.

BARS were to be based on the supervisors own choice of dimensions and of examples to anchor those dimensions. They were to aid the supervisors in discussing what he or she expected in job behavior. Although the scales had been built, they had not been put into full use at the time of Post-test 2.

Long delays and difficulties were encountered, because of the major problem with organizational line of command which was discovered at middle management levels. This problem will be discussed in more detail later in the Introduction.

Post-test 1 Results

The Progress Report based on the Post-test 1 Survey presented and discussed the changes from August 1981 to August 1982 on the Input and Outcome Variables. The main findings from the Progress

Report will be summarized briefly in this report to help clarify the comparisons and relationships investigated in this Final Report.

To assess the effectiveness of the planned intervention, the analyses of the Post-test 1 data presented in the Progress Report had included only those employees who had actually received one or more BONEs (approximately 700 employees). The Post-test 1 analyses attempted to estimate the direct influence of the planned intervention.

Comparisons of the Input Variables measured at the Pretest sessions and Post-test 1 session indicated that small but significant changes in the perceptions about the jobs had occurred, at least for the employees included in that analysis, all of whom had received at least one BONE. On eight of the Input Variables, a significant increase in scores occurred from the Pretest to the Post-test 1 (see pp. 21-23 and Figures 5, 6, and 7 of Progress Report). These variables were Task Variety, Feedback, Goal Clarity, Goal Setting Feedback and Evaluation, Participation in Goal Setting, Job Definition, Recognition of Performance, and Communication of Work Changes. The increases in the scores on the Input Variables can most reasonably be attributed to a joint effect of the BONEs and the clarification of the supervisory responsibilities which resulted from the attempt to identify supervisors who observed behavior sufficiently to enable them to write and discuss BONEs.

Related to the noted changes in the Input Variables were changes in certain Outcome Variables (see pp. 17-20, and Figures 2, 3, and 4 of Progress Report). Small but statistically significant increases were noted for the scores on Supervision and Co-worker satisfactions, Identification with the Work Organization, Trust in Management, and Trust in Fellow Employees. Scores on Intention to Quit showed a significant decrease (improvement) from the Pretest to Post-test 1 sessions.

The increase in satisfaction with Supervision seemed to be directly related to the BONEs treatment and the accompanying clarification of supervisory responsibility. The other changes, however, were probably multiply determined, and, therefore, were not attributed solely to the intervention and changes in the Input Variables.

Two special scales or variables, Number of BONEs Received and Clarity of Supervisory Responsibilities, were developed especially for the Post-test 1 survey to evaluate whether the extent of exposure to the intervention was related to the changes in the Input and Outcome Variables. Even after statistically controlling for the contaminating factor of level in the organization (see pp. 24-25 of Progress Report), there was a pattern of significant correlations between the number of Bones received and several important Input and Outcome Variables. Most of the significant relationships were with the same variables that had improved between the Pretest and Post-test 1 (see p. 26 of the Progress Report for those variables which were significantly related to number of BONEs). A similar pattern of

correlations, again after controlling for level in organization, was also found involving the variable Clarity of Supervisory Responsibility (see pp. 27-28 of Progress Report). The effects of the Number of BONEs received and changes in Clarity of Supervisory Responsibility were found to be separate and independent; each, however, was related to improved employee attitudes. When the two effects were combined, the increase in the Outcome Variables was substantial, particularly for two variables: Satisfaction with Supervision, and Trust in Management. Perceived Feedback also increased, on the Input side. The relationships were greater than expected considering the short time of exposure to BONEs, the absence of any adequate measure of quality of BONEs, and the recency and incompleteness of the changes in the organization intended to clarify supervisory responsibilities.

Based on Post-test 1 data, it was concluded that there had been favorable changes since the Pretest session. First, mean scores for relevant Input and Outcome Variables had significantly improved since the Pretest session for those employees who had received BONEs. Secondly, scores on the Input and Outcome Variables were correlated with the best estimate available of the extent to which each individual had been exposed to each aspect of the intervention. The mean scores were still not very high, still much lower than national norms on the Job Descriptive Index for example. However, based on the Post-test 1 results, it was expected that the effects of the intervention would continue and that the introduction of the BARS scales and their relationship to BONEs would contribute further to favorable changes.

Changes That Have Occurred at Watts Bar

The planned first part of the intervention, BONEs, has already been summarized in the Progress Report. The planned changes that have occurred since the Post-test 1 will now be summarized followed by a discussion of the various unplanned events that have occurred throughout the total program.

Use of BARS

A complete description of the development of the BARS is contained in the Progress Report (see pp. 8-9). The resulting scales cover the principal areas considered important by the TVA supervisors. These are: Relating to Supervisor (RS), Planning Work Activities (PL), Considering "Feelings" and Ideas of Subordinates (CS), Accepting and Adjusting to New and Existing Policies and Procedures (P & P), Interacting with Co-Workers (CO), Working Accurately (ACC), and Using Time Effectively (TM). It was expected that the number of scales actually used would be smaller than the number developed, particularly for certain jobs, so that fewer could eventually be presented to the supervisor.

For each BONE a supervisor wrote, he was to choose the BARS scale most appropriate for that BONE, locate the position on the scale which best described the evaluative level of the BONE, and mark that scale value on the BONE. Both the supervisor and subordinate would have a copy of the BARS scales. The scales, then, would serve as a basis for talks between supervisor and subordinate concerning relative strengths and weaknesses of subordinate performance, as well as for specific goal-setting for the future. The BARS scales were intended only incidentally to help in the overall formal performance evaluation, and only after they had been modified and simplified according to practical use, for each particular group of jobs.

The use of BONEs for some reason was discontinued by many supervisors sometime after the first Pretest Survey. After the presentation of the Post-test 1 results the project manager reinstated the BONEs and BARS program by asking supervisors who had discontinued use of BONEs to resume use of the system. In addition, all supervisors were asked to begin using the BARS scales for rating the BONEs. The investigators assumed that that decision had generally been implemented and that most employees soon would be receiving both the BONEs and BARS. Additionally, since the Post-test 1, BONEs training sessions have been continued for new supervisors.

Several problems with the use and adoption of the BARS scales appear to have occurred. First, we understand that although supervisors were instructed specifically on how to use BARS after they were developed, the employees who received them did not understand. Based on employee comments on Post-test 2, many also viewed the scales as just another "gimmick." Also, some supervisors apparently did not understand or appreciate the scales and their potential value, or did not relate the BARS anchors to actual BONEs they observed.

The fact that some of the BARS scales had spaces without anchors presented a second problem. The gaps arose because even when supervisors did observe incidents and record them on BONEs, the incidents were rated as either very high (but not outstandingly) on the dimensions, or rated as at the extreme lower end of the unacceptable level. Perhaps these BARS scales would have been easier to use and understand if the gaps at the very top and at the middle of the scales could have been filled with anchors. We hoped that, as examples from BONEs were notated on BARS, the gaps would be filled for each job area.

A third difficulty with the use of the BARS may have been due to the general nature of the scales. Perhaps the scales would have been more acceptable and used if the anchors were more directly relevant to the particular unit or schedule of the supervisor and subordinate. Revision for specific units and schedules had been planned as more BONEs were collected and located on the BARS.

Clarification of Supervisory Responsibilities.

The Post-test 2 survey was originally planned for administration after all recommended changes had taken place and had had time to take effect. As discussed in the Progress Report, there was an unanticipated delay in initiation of BONEs at the various levels of supervision. For a considerable number of subordinates, it was not possible to identify a supervisor who had had enough contact to comment on the job behavior of the subordinate. In some cases, the person chosen to write BONEs resisted participation because he considered himself and was considered by others as a peer rather than a supervisor of the person on whom he was writing the BONEs. Initiation of BARS, and integration of BONEs with BARS, were therefore delayed for an extensive period of time. The simplification of the BONEs procedure which was to accompany the introduction of the use of the BARS has not been accomplished because the reorganization at middle management levels was not completed and we never reached the stage of simplified notation. We had intended that the BARS be used to facilitate communication up and down the line of responsibility and to form a sounder basis for personnel decisions such as merit rating. The second "post-test" was run, therefore, essentially without the use of BARS rather than with full implementation of the BARS as was originally intended.

It is unclear, at this time, to what extent attempts have been made since the Post-test 1 to continue the task of clarifying the organizational lines of supervision. The data from the Post-test 2 survey suggest that attempts to clarify the organizational lines of supervision have not been completed. This problem will be discussed toward the end of the Results section.

Misinterpretation of Progress Report.

From the comments written on the Post-test 2 surveys, it appears that the small, significant improvements reported in the Progress Report were interpreted by some as a claim for a large improvement. Those people who commented indicated that they had not seen any improvement at WBNP and suggested that we had claimed a large improvement simply so that TVA would continue its contact with us. The Progress Report clearly shows that the increases in the scores were small (see Figure 2 of the Progress Report) and still below national norms. These misconceptions could not reasonably be attributed to the formal communication of results. The report in "Watts Happening" was both cautious and accurate (10/22/82). Although these misconceptions most likely had no direct influence on the measured attitudes at WBNP, it is unfortunate that some employees seem to have misunderstood the information and conclusions presented in our Progress Report. It is also unfortunate that employees believe that continuation of the BONEs system benefit the consultants financially, instead of actually costing them money and time.

Communications Committee.

Since administration of the Post-test 1 survey, the Communications Committee was given renewed emphasis at WBNP. Questions were included in the Post-test 2 survey to aid in determining whether impact of the communications committee related to employee attitudes.

Good Neighbor Program.

Since the Post-test 1 survey, a program has been instituted to help needy families in the Watts Bar area. Thus, questions were included in the Post-test 2 survey to investigate whether perceptions about that program relate to employee attitudes.

Completion of Construction at WBNP.

Completion of construction at WBNP is approaching. Not only does this change the nature of the job for many employees, it also raises feelings of uncertainty concerning future employment. The relationship between attitudes and this uncertainty is impossible to assess.

Economic climate.

As mentioned in the Progress Report, since the intervention was started, construction on other nuclear plant sites has been stopped. The number of construction jobs in the area has diminished. These changes have been coupled with high interest rates and resultant reduction in construction work. In addition, inflation and recession have darkened the economic situation. The direct and indirect effects of these changes on job attitudes are impossible to estimate from our data. They probably intensify employees' feelings in both directions.

Transfers.

For various reasons, an unusually large number of employees have been transferred from other plants to WBNP. Whether the attitudes the transfers bring with them affect the attitudes of employees already at WBNP, or whether the transfers' attitudes are reshaped by the WBNP employees is unknown, although the latter would seem more likely. Differences between the attitudes of the two groups, new transfers versus those who have been at WBNP more than a year, are investigated and presented below.

Perceived Wage Inequities.

Since the intervention was started, there have been numerous complaints concerning pay. These complaints have been directed both at management and at the consultants, saying that neither have done anything to improve the situation. Our intent has never been to deal with wages directly, although the BONES and BARS system

used correctly has the potential to eliminate the "buddy system" and, after a period of successful full implementation, could be tied in to determinations of wages. This stage has not been reached at WBNP.

Another problem was that some employees did not recognize that the salary surveys conducted by others were distinct from our morale surveys. As a result, some employees apparently expected our proposal to address the problems of pay and promotion. We have not been consulted about this problem.

PURPOSE

The third survey of employee attitudes and beliefs at WBNP was completed in November, 1982. At that time, those employees scheduled for training in observation, recording, and discussing their observations had completed their training and were to have begun use of the BARS scales. Fifteen months had elapsed since the Diagnostic Survey in the summer of 1981.

The present report represents a summary of the status of personnel attitudes and beliefs after the proposed intervention had been introduced. This third survey permits three sets of comparisons: differences within the present sample, differences between the Diagnostic Pretest and the Post-test 2, and differences among the Diagnostic Pretest, Post-test 1 and the Post-test 2. Present attitudes and beliefs of employees will be investigated by considering the possible causes of positive and negative feelings in the individual and in the situation, including the application of the BONEs system.

Comparisons with both the Diagnostic Pretest and Post-test 1 can be used to understand changes in attitudes and beliefs. The effectiveness of the interventions can be evaluated by considering the favorable and unfavorable changes in attitudes. Unfortunately, however, as mentioned in the Post-test 1 report, other changes not directly the result of the intervention could have caused changes in attitudes. It is not possible in any simple manner to separate those changes from those due solely to the intervention. However, we will use converging evidence from both correlations of variables and changes with time to indicate the most likely and strongest influences.

Procedure for Post-test 2

A. Sample

Employees were surveyed with essentially the same instrument developed and used for the Pretest session in August, 1981 and the Post-test 1 session in August, 1982. A few tests which had

proved relatively unhelpful were dropped (mostly personal characteristics, mediating variables) and others designed for the WBNP situation were added.

Approximately 700 employees completed the questionnaires for the Post-test 2 session. The final sample for Post-test 2 can be broken down as follows:

By schedule: SA=26; SB=125; SD=147; SE=304; M=70; Foremen=8.

By Sex: Male=505; Female=170.

By Age: 18-25 years=148; 27-34 years=272; 35-41 years=129; 42-48 years=71; 49 and older=69.

By Education: High school=148; Some college=202; 2-year technical=60; Associate degree=108; College degree=216; Graduate degree=35.

By Tenure at WBNP: Less than one year=167; 1-3 years=308; 4-7 years=144; 8 or more years=70.

The proportions above do not vary significantly from those reported for the Pretest (Diagnostic Survey, p.III) and the Post-test 1 (Progress Report, p.14). The Foreman job classification, however, was not represented in the Post-test 2 sessions because they were not to be a part of the BONEs/BARS system.

The sample was primarily under 40 years old, under 7 years tenure at Watts Bar Nuclear Plant, and with some education beyond high school. The greatest number of people were classified in Schedule SE. The totals for each category are not equal due to some employees omitting questions. (Please see Appendix B, pp. 1-2).

B. Administration

The survey (see Appendix A of this report) was administered at the end of November, 1982. The appropriate number of survey booklets were sent to each work unit and completed at a time chosen by the individual within approximately four days. Anonymity was stressed although each unit checked off when a questionnaire was returned.

C. Overview of Analysis

Preparation of data tapes. An identification number was constructed using the "Information for Code Number" provided by each respondent on the last page of the survey booklet, and was posted on the computer answer sheet. The answer sheets were edited for unclear markings, etc. Matching by code numbers was not done, however, as it proved to be

unnecessary for the analyses of this report. (Differences were large enough and sufficiently clear-cut that we did not need this additional control to uncover the significant effects.)

Answer sheets were retained if more than 80% of the first 254 questions were answered. This resulted in 716 usable questionnaires.

Construction and analysis of WBNP scales. The scales constructed for the Diagnostic Survey report and the Post-test 1 report were also used in the Post-test 2 analysis. Psychometric information for each scale is described in Appendix D of the Diagnostic Survey (Pretest) report. Psychometric properties of the scales in this administration replicate those found in the Diagnostic Report; those for the newly constructed scales are also satisfactory.

Figure 1 shows the scales used in the Pretest. Some scales, particularly the mediating variables, were discarded for Post-test 1 and more for Post-test 2, because they were not contributing information of use to Watts Bar. A few scales were added to strengthen longitudinal comparisons and to investigate special programs. The "Sureness" or "Clarity of Supervisory Responsibilities" scale was retained from Post-test 1. Several new short scales were introduced for Post-test 2: Attitude toward Good Neighbor Program, Participation in Good Neighbor Program, Attitude toward Communications Committee, Attitude toward Orientation Program, Quality of Application of BONEs System, and Quality of Application of BARS. (Figures are to be found after the Discussion and Conclusion section of this report.)

The major part of the analyses for this report will describe the comparison of scores on the Input and Outcome Variables for the Pretest and Post-test 2 surveys, and the Post-test 1 and Post-test 2 surveys. Another substantial portion will concern the way in which the various scales correlated with one another at the time of Post-test 2.

The groups of Input and Outcome Variables shown in Figure 1 were treated in separate analyses. The scales were grouped according to the extent to which they rose and fell together with changes in conditions and between individuals. The main thrust of the analysis was to determine for whom and under what conditions attitudes and feelings were favorable or unfavorable.

The differences and trends in the results will be discussed in the Results section as well as some of the more interesting findings which are represented in the figures.

Summary of Open-ended responses. Respondents were encouraged to write additional comments regarding their job, Watts Bar, and TVA in the space provided at the end of the

survey. All questionnaires with written responses were read and summarized. General comments were made on 186 questionnaires, approximately 25% of the total sample. The content of the responses was put into meaningful categories or themes, e.g., feeling towards TVA management, feelings toward BONEs, pay and promotion. The number of times a theme or category was mentioned was recorded as well as any particularly noteworthy quotes. The results from the open-ended responses will be integrated into the Results and Discussion section of this report.

Summary of open-ended responses to the orientation and new employee questions. Respondents also were asked to describe briefly the orientation information they considered the most helpful and any additional information which should be provided new employees. Forty-four responded and the responses again were organized into meaningful themes or categories. The frequencies of themes were determined and meaningful quotes were summarized. The results of this content analysis will be summarized and discussed in the Results and Discussion section below.

RESULTS AND DISCUSSION

A. Overall Morale

The outstanding feature of the results is that morale and satisfactions are still very low for a large number of employees. This fact is most evident in the answers to the open-ended questions at the end of the Post-test 2 survey. ("Is there any way in which your particular situation at Watts Bar could be improved? Explain..." and "Please make any other comments you would like to make regarding your job, Watts Bar and TVA...") Approximately 25% of the surveys contained written comments and, overwhelmingly, these responses were negative. They were more frequent and stronger in tone than in either the Pretest survey or the Post-test 1 survey. Test scores also show a substantial decline on many scales since Post-test 1. For the present analysis, we first looked at the average scores on all variables for all employees combined, on the mistaken assumption that almost all would have been receiving BONEs and BARS since July. The results for this total group were so striking that we feel they should be reported here, and compared with the results for all employees both on the Pretest and the Post-test 1.

1. Pretest to Post-test 1. The first logical step in analysis was to look at the data for the total group so that all employees at Watts Bar would be included at each testing time. The reader will recall that we included in the Progress Report (first Post-test) only those employees who acutally had received at least one BONE. We have gone back to add all other employees for comparison in the present report.

a. Outcome Variables. Figure 2 shows the averages for JDI satisfactions for the Pretest and both Post-tests, as well as for the national sample. Figure 3 shows the average on Job-in-General satisfaction for the three samples (national norms not available for the JIG). Two principal points are evident; (1) scores at WBNP continued to be very much lower than for the national sample; (2) there was no significant change in job satisfaction between the Pretest and Post-test 1 for Work, Pay, Promotions, or Job in General Satisfactions; and (3) there was a small but significant improvement in Satisfaction with Supervision and Co-workers; there were also substantial improvements in Trust in Management and Intention to Quit.

b. Input Variables. General Feedback, Goal Clarity, Goal-setting Feedback, Recognition of Performance, and Communication of Work Changes also improved significantly from Pretest to Post-test 1. Job Definition actually decreased slightly.

None of these changes were numerically very large, although the changes could not reasonably be attributed to chance. (Less than five times in 100 would such differences arise by chance for all differences reported. In most cases, the differences were even greater so that they would be attributed to chance only one in 100 or one in 1000 times.)

Differences were generally larger and more consistent for those employees who had received one or more BONEs. (As indicated in the Progress Report, improvements were not large.) The reasons for the greater improvement in the BONEs group will be discussed later, below.

2. Post-test 1 to Post-test 2. All employees.

a. Outcome Variables. The drops between the last two testing sessions were, in general, greater than between the Pretest and the Post-test 2, since scores in general had first improved and then dropped. Significant decreases of scores appeared for satisfactions with Pay, Promotions, Supervision, and especially for Job in General. There was also a small drop in the Acceptance of Job Changes.

b. Input Variables. Results are mixed in this set of comparisons. Task Variety and General Feedback continued to improve significantly. Goal Clarity, Goal Feedback, and Communication of Work Changes returned to their Pretest levels.

3. Pretest to Post-test 2. All employees.

a. Outcome Variables. Scores on satisfactions at WBNP continue to be below national norms. Improvements in satisfactions and morale had almost all either diminished or been wiped out entirely by the time of the second Post-test, with the one exception of satisfaction with Co-workers, which continued to be improved. There were significant drops in satisfaction with Pay and Promotions, overall satisfaction (Job in General), and Acceptance of Job Changes.

b. Input Variables. Two measures continued to improve substantially: Task Variety and General Feedback (JCI). Recognition of Performance also continued to show slight improvement over Pretest scores. Job Definition recovered and improved.

In summary, although some measures have continued to improve, there is clear deterioration in average scores for most Pretest measures, especially since Post-test 1. This last decline seems to be global, permeating many areas. The changes are largest, relatively, for morale and

satisfaction measures. The actual means are given in the computer printout, Appendix C.

4. Individual Differences. Post-test 2.

The changes reported above are averages, for all employees. There is, however, considerable variance among individual employees. Many individuals are reasonably satisfied despite the overall average decline. For example, on Job in General (JIG), 51% answered above the neutral point on the Post-test 2. Also, even on Trust in Management, one of the scales with the lowest average scores, 28% still responded with positive Trust in Management.

Many measures were highly correlated at the time of Post-test 2. This means that those persons who reported satisfaction according to one measure (e.g. Job in General) also reported satisfaction according to other measures (e.g., Trust in Management, or low Intention to Quit). The reverse is also true -- those who were dissatisfied on one measure tended to be dissatisfied on the other measures. In general, those measures that declined together between the last two administrations also were correlated among individuals, thus indicating that at WBNP those variables are reflecting a general overall attitude, favorable or unfavorable, about the job. This feeling is not strongly related to overall Life Satisfaction or to Trust in Fellow Employees, indicating that it is not merely overall mood or temperament.

5. Intensity of Feeling.

The negative feeling toward the job situation is nevertheless quite intense, at least in some employees. There are several lines of evidence for this intensity.

a. Retrospective measures. Intensity of feeling can be estimated by asking employees to recall their satisfactions retrospectively. When people feel strongly about an aspect of their situation, their memory of the past is distorted more than when they are relatively objective and emotionally detached.

We introduced two types of retrospection. First, we asked (Q.36, second answer sheet) "Considering everything, would you say you are now more satisfied or less satisfied with your job than you were in July?" Forty-five percent stated that they were less satisfied; however, distributions show that at most, assuming all changes to be negative, our best estimate is that only 20% actually decreased their actual scores. Second, we asked employees to fill out the JDI as they would have in July. The analysis found that employees retrospective feelings about their job [illegible] their retrospective scores were much more similar to the current scores than to the scores

actually reported in July. Thus, people retrospectively reported they were much less satisfied in July than they actually were. Distortion of this magnitude is presumably evidence of strong feelings.

b. Correlation across most variables.

The strength of feeling is reflected also in the way that attitudes about one aspect of the job situation "spill over" into attitudes about other aspects of the job situation. In previous surveys, it was possible to separate rather cleanly the feelings about management from those about immediate supervision and the work itself.

This independence is not as clear for the ratings on the present survey. Almost all scores are related. One can distinguish, however, that a group of general satisfaction and morale measures are more closely related to one another than they are to the other measures in the survey. This is a very strong group whose influence impinges on most other variables. When a number of variables strongly tend to rise and fall together, we speak of this group of variables as a cluster or factor. At the heart of this general factor are such variables as satisfaction with Job in General, Intention to Quit, Identification with TVA, Work Satisfaction and Trust in Management. We will call this group the Morale factor.

Another related but distinguishable group of variables centers around Supervision Satisfaction and General Feedback. Other groups of variables can also be distinguished. We will discuss these groups of variables later as they become relevant.

Now it seems best to concentrate on the first factor, which demonstrates the general, global, decline in morale. The pervasiveness of this general factor can be illustrated by a few examples. Figures 4 and 5 show comparisons of mean scores for those persons indicating above average Trust in Management with those for persons with below average Trust. Overwhelmingly, the High Trust in Management persons were higher for Satisfaction with Work, Supervision, and Job in General. These differences are shown in Figure 4. High trust persons are also higher on Identification with TVA (IWOI; see Figure 5, first pairs of vertical bars) and lower on Intention to Quit. Significant, but smaller, correlations with Trust in Management also appeared for the other outcome variables (Satisfaction with Pay, Promotions, and even Co-workers, and also Acceptance of Job Changes). Input Variables are also correlated with Trust in Management, particularly General Feedback, Goal Clarity, Goal-setting Feedback, Participation in Goal-setting, Job Definition, Recognition, and Communication of Work Changes. These differences are substantial. Figure 5 (last three pairs of bars) shows typical small but significant relationships between general Morale and other perceptions and attitudes. One would not ordinarily expect these to be significant. That they are

significant demonstrates that the general feeling is so pervasive that even attitude toward the Good Neighbor Program, Clarity of Supervisory Responsibilities, and Attitude toward the Communication Committee are affected. These last three relationships are not, of course, large enough to explain differences in Trust in Management. The largest relationship of the three illustrated accounts for less than 10% of the variation among individuals.

The spread of general positive or negative feeling shows up in other important ways. Figures 6 and 7 show differences in Intention to Quit. A high score indicates intention to seek other work (labeled "Quit" on the charts); a low score indicates intention to stay at TVA (labeled "Stay"). Intention to Quit is highly related to Trust in Management, Job in General, and other measures of morale. Figure 6 compares "Quit" and "Stay" groups on Work, Supervision, and Job-in-General satisfaction, just as Low Trust and High Trust groups were compared in Figure 4. There were also large and significant differences between those who intend to quit or to stay in Trust in Management, Participation in Goal-setting, Goal Clarity, Goal-setting Feedback, Job Definition, Recognition, and Communication of Work Changes. Again, there are some small but significant differences on some variables which ordinarily would not be expected to be different (Figure 7, last three pairs of bars): Attitude toward the Good Neighbor Program, Clarity of Supervisory Responsibilities, and Attitude toward the Communications Committee.

Work, Supervision, and Job in General Satisfaction (Figures 4 and 6), plus Identification with TVA (IWOI) (Figures 5 and 7) and Intention to Quit are part of the cluster of measures of overall morale. The pervasiveness of this overall factor is demonstrated by large differences between mean scores on the Input and Outcome Variables where employees are grouped according to low versus high Trust in Management and low versus high Intention to Quit scores.

c. Answers to open-ended questions.

Table 1 Appendix A shows the results of the content analysis of the open-ended questions. Two of the most frequently mentioned topics confirm the pervasiveness of the overall morale factor which permeates all the attitude measures. When we classified the themes, we grouped these under either "Morale" or "Management and Supervision." A number of responses under "Miscellaneous" could also be put in this overall general factor. The frequencies for a particular theme give a rough indication of importance to those choosing to write a response. We must remember, however, that the same respondent may cover several themes or give a response that can be categorized in several ways. Moreover, several people who handed in their questionnaires together gave identical [illegible] responses, so that frequencies may be somewhat distorted.

The negative tone is obvious. The reader should bear in mind, however, that free responses tend to be negative in almost any situation, especially when the questions ask about ways in which the situation could be improved. Even so, there is a great deal of expressed dissatisfaction with management, which corresponds to the low (and decreased) scores on Trust in Management.

Distrust in management was strong on the Pretest survey, and it not only has not been alleviated, but has apparently worsened. Employees blame management for almost all unpleasant aspects of their situations, whether or not local management actually has any control of those aspects. Some examples which seem typical of these responses are:

> There are several significant problems at WBNP, i.e., harassment by Management, continued changes in management policies, rumor of RIF's, continual rework die to mistakes or lack of documentation with no actions against those responsible, merit raises designed to eliminate partiality but in reality promoting it, depressed pay raises, the BONEs system, etc. These problems are chronic and should be addressed. If management wasnt to accelerate attrition, it should be humane and RIF employees instead of harassing them into leaving.

> I don't feel all of TVA is like WBNP. I have worked at another of TVA's construction sites and it was nothing like this. The people were more productive and concerned about doing a good quality job. I feel that this was a direct result of the feelings of the upper level management. I'm not sure what this plant needs to increase productivity and morale, but I think a change in the management philosophy would help.

> Many, many changes should be made. Management should be trimmed down drastically. Excessive and "deadwood" managers should be terminated. Excessive and "deadwood" employees (both annual and craft) should be terminated. Only intelligent, hard working and qualified people should be retained.

> Every one of the problems costs TVA and the rate payer a lot of money. A drastic cost savings could be realized along with improved employee attitude, job performance, and moral if TVA would do their duty to resolve the problems. As long as TVA keeps ignoring the problems, employees attitude, job performance, and morale will continue to decline....

> TVA attempts to function without concern for the needs of its employees. This does not work in private business and it is not working here.

Mistrust in upper level management (sometimes including Knoxville) was explicit in some cases and implicit in many more. The above responses are not exceptionally strongly worded; some were even more intense. Management is an easy target when employees are dissatisfied, so these negative comments might have been expected.

It is difficult to overcome mistrust once it has been aroused. Every action of management, however benevolently intended, is viewed in a negative manner. Neither the efforts of management nor those of the consultants alleviated this mistrust among those who reported it at the time of the first survey.

B. Supervisory Communication

As we have shown above, the overall attitude toward the job situation is so strong that most scales show some correlation with each other. Closer examination, however, reveals a second distinguishable sub-group of scales. Scores on Participation in Goal-setting, Goal Clarity, Satisfaction with Supervision, Feedback and Communication of Work Changes scales tend to vary more with each other than with those scales which identify the general factor, such as Job in General, Intention to Quit, Identification with TVA, and Trust in Management. We will call this second subgroup, which consists of both Input and Outcome Variables, "Supervisory Communication," although it also includes Feedback and Goal-setting.

Means on these measures either remained constant or actually improved from Pretest to Post-test 2. This secondary group of variables also appears in the free responses, as "Communication," although some of the free responses concerned with supervisory behavior and knowledge are categorized under "Management and Supervision." Comments are uniformly negative, despite the reasonably high average test scores. Of course, the discontented are much more likely to take the trouble to write comments.

Some typical comments are:

My present situation would be greatly improved if supervisors did not let personal feelings influence decisions concerning actions on my behalf.

Supervisors worked with us to try to improve morale in our unit. I feel that low morale in this unit is due to present supervisors. They tend to "drive" employees as a group to get things done (sometimes in a very tactless manner) instead of working with us as individuals. I find it very difficult to communicate with someone regarding job-related problems/situations when I don't feel comfortable saying "good morning" to him.

> Supervisors were aware of the amount and quality of work I accomplish. Recently, our supervisors have made my unit feel that we accomplish nothing beyond sitting on our posteriors all day. They do not take the time or effort to assess the situation. Also, supervisors tend to agree and do what is necessary to make themselves look good to other top managers regardless of the fact that, in a lot of cases, it makes my job more difficult. I feel that I should be consulted before those decisions are made. I, as most people, would "go the extra mile" any time for a supervisor who makes me feel that he is aware of what I do and appreciate my accomplishments. At present, this is definitely not the case....
>
> Supervisors need to treat employees with respect and recognize them other than when something is needed, response would be greater.
>
> The BONEs/BARS system... I see no real problems with my communication and working relationships with my group leader of fellow employees. We all work very well together, we all understand each others needs, and we all try to help each other out. And you seem to be trying to correct the above mentioned problems!?! Hm, makes sense doesn't it? The real problem of mistrust, communication, and morale exists between us and upper level managers, not in the lower levels....

Fourteen respondents specifically mentioned that subordinates were treated condescendingly, like children, with lack of respect. In various ways, employees expressed their belief that management and supervisors play favorites, expect the subordinates to take the blame for the supervisor's errors, and do not know their subordinates jobs.

Communications remain a problem. Despite BONEs, feedback and verbal recognition are still requested. Apparently, some supervisors are using BONEs only for negative comments. Also, their supervisors are not, for the most part, emphasizing the usefulness of BONEs in obtaining effective two-way communication.

C. Causes of Positive and Negative Feelings and Perceptions:

A Detective Story

Why is the general feeling so strong at WBNP? The differences among individuals are very large, covering the entire range of possible scores for most scales. Management needs to know the causes of these differences. We undertook a number of different analyses to find out the reasons for the average drop in morale, and for the large differences among individuals.

For whom, or in what situations, has morale remained steady or increased? For whom, or in what situations, has morale dropped sharply?

Secondarily, what about the set of variables we have called Supervisory Communication? For whom, or in what circumstances, has satisfaction with communications increased or decreased?

We investigated a number of possible sources for the differences, one after another. We will briefly summarize the findings here. For a more detailed analysis of each investigation see Appendix B.

1. Preliminary Investigations. First, we examined the demographic variables of education, unit, schedule, and tenure. Although there were some differences on Input and Outcome variables according to education and tenure, no differences were large enough and consistent enough to account in even a small way for the big general differences in Morale or in Supervisory Communication. On the other hand, differences in units and schedules were responsible for a major part of the differences in both the overall Morale factor and the Supervisory Communication factor. The question brought out by these results is: "What is there about these units and schedules which is associated with big differences in satisfactions?"

Several other variables were investigated, to see if any of them could account for the differences in Morale and Supervisory Communication. Analyses of Transfers, the Orientation Program, the Good Neighbor Program, the Communications Committee, the approach of plant completion, and Clarity of Supervisory Responsibilities, although showing some significant differences in Morale and Supervisory Communication, again showed small and inconsistent differences and so could not account for the big differences in those two factors.

Pay and Promotion Satisfactions also were analyzed. They are undoubtedly a principal area of dissatisfaction; however, although they showed some correlation with the variables in the overall Morale factor and the Supervisory Communication factor, they correlated more highly with each other and with Recognition of Performance. Thus, they too cannot be considered the principal source of differences in Morale and Supervisory Communication.

None of these variables could account for the large obtained differences in Morale or in Supervisory Communication. We therefore turned to consider the actual effects of BONEs.

One more small but important cluster is evident. One of the very highest correlations among all the comparisons was a correlation of .60 between Co-worker Satisfaction - [illegible] Fellow Employees. The relationship is too large to be attributed

to the overall Morale factor or to the Supervisory Communication cluster, and is unrelated to Pay Satisfaction. There are large individual differences in Co-worker Satisfaction. The average overall has continued to rise. Trust in Fellow Employees also rose for the first Post-test and has not changed significantly since.

The favorable attitude toward and Trust in Co-workers is one clear-cut asset at WBNP. Management can and should build upon it.

2. Exposure to BONEs. BONEs and BARS were intended to improve two-way communication, and to eventually permit a more equitable basis for personnel decisions such as merit increases.

Open ended comments concentrated heavily on the extreme dislike of BONEs and BARS by many employees. On the basis of these comments, we assume that they have had a deleterious effect.

The free responses concerning BONEs, BARS, and the consultants are by far the most frequent comments. The content analysis is given in Table 1, Appendix A. Some typical comments are:

> The BONEs/BARS system only adds to the tons of paperwork we are required to do. Employees have known all along what their group leaders thought about them. The problem is that the people who should be able to promote or obtain merit raises for their people are the ones who have no idea what their subordinates do.
>
> What a waste of money, TVA has spent with your company. It's really sickening. We got a 3% raise (or less) but they can pay out a million dollars for you to ask us dumb questions. That's what we spend half our time doing-- Playing TVA's games. No wonder they don't have things done on time...
>
> I feel that the BONE system was dealt a fatal blow with the introduction of BARS. Why was the method of rating someone's behavior either (1) adequate, (2) superior, or (3) needs improvement eliminated in favor of BARS? Again, management has taken something simple and easy to understand and changed it for the worse. The intent of the BONE is to communicate with the employee, and I feel this communication could be done more effectively without using the BARS....

The BARS system sucks. A simple adequate or inadequate or superior better describes any given job behavior than the BARS....

I feel that the BONEs program could be very effective in a profit oriented organization. Presently, it would not work with TVA unless upper management is willing to make high impact, far reaching policy changes. Secondly, TVA must give supervisory personnel at all levels, authority to go with the responsibility assigned. Also, supervisory personnel, if given authority, should be made accountable, and a set of guide lines to make their subordinates accountable.

Recommended policy changes are: (1) The merit review process should be arranged so the subordinate has a means of progress, (2) the subordinate should be given a reason for not receiving a step or merit increase, (3) managers should be trained and evaluated on the methods and means they promote "self-esteem" and "job satisfaction" in their subordinates....

Frequently several respondents made identical responses, as if they were quoting a slogan going around their departments. The negative feeling was unmistakable. Many employees believe that the consultants are being paid for work done beyond the initial contract. The consultants, like management, are easy targets for blame for undesirable conditions beyond their control. Since there is a strong anti-BONEs faction, at least, at WBNP, we concur with management's decision not to continue the program in its original form.

Free responses were given by only a minority of employees. It was necessary, therefore, to analyze the quantitative responses of the entire sample. Thus, effects of several aspects of the BONEs system were checked.

a. Whether BONEs were received. First, it was necessary to evaluate the extent of the difference between satisfactions of the people who had received BONEs recently and those who had not. Question 32 (second answer sheet) asked: "During the past several months, estimate the number of BONEs you have received per month." First we divided the total group of employees into "BONE" and "No BONE" groups. Approximately 474 had received BONEs, but 235 had not.

b. Differences in means between those receiving and those not receiving BONEs. There are an astonishing number of large differences between the BONEs and No

BONEs groups. All differences show higher morale and satisfaction for those who have received one or more BONEs as compared with those whose supervisors have abandoned or not initiated BONEs.

For the Outcome Variables, the scores which are significantly more favorable for the BONEs group are, in order of size and consistency of differences: Satisfaction with Supervision, Trust in Management, Satisfaction with Promotions, Satisfaction with Job in General, Identification with TVA, Satisfaction with Pay, Satisfaction with Co-workers, and Acceptance of Job Changes.

On the Input side, Recognition of Performance, General Feedback, Goal Clarity, Job Definition, Participation in Goal-setting, Goal-setting Feedback, and Communication of Work Changes were all substantially higher for employees whose supervisors had given them at least one BONE. Figures 8 and 9 illustrate the size of this surprising result and led to a number of further analyses to determine why the differences obtained were in the direction opposite to that expected on the basis of the answers to the open-ended questions.

c. Increases or smaller decreases between Pretest and second Post-test for employees receiving BONEs. On the outcome side, the BONEs group still showed improvement at Post-test 2 for Satisfaction with Supervision and Co-workers, and for Trust in Management and in Fellow Employees. There was no significant change for those receiving BONEs for Intent to Quit, Acceptance of Job Changes, and Identification with TVA.

Several Input variables improved for the BONEs group, only since the Pretest: Goal Clarity, Goal-setting Feedback, and Job Definition. (Variety and General Feedback improved for both groups.)

d. Smaller decreases between first and second Post-tests for those receiving BONEs. After the improvement from the Pretest to the first Post-test, did BONEs group "hold their own" since Post-test 1, or did they simply show less decline than the no BONE employees? With few exceptions, they merely showed less decline since the first Post-test. Satisfaction with Co-workers and Trust in Management on the Outcome side showed no significant further decline. On the Input side, Variety, Feedback, Goal Clarity, Job Definition, and Communication of Work Changes actually improved, while Recognition of Performance remained about the same.

3. Quality of application of BONEs system. Did perceived quality of application of the BONEs system relate to Outcome and Input variables in addition to the effect of having received

at least one BONE? A scale for quality of application of BONEs system was constructed based on responses to Questions 193-196 and 200 (second answer sheet).

First of all, how many people reported that BONEs were used effectively by their supervisors? If we take "uncertain" as a breaking point, 71% rated at least one of these questions as less than favorable. (But 24% did have something favorable to say.) Most people said that BONEs were not used effectively by their supervisors.

Is the feeling about the quality of application of BONEs related to other attitudes and feelings? It is related to the number of BONEs actually received, but also to a long list of other variables in both principal clusters (unrelated to Pay Satisfaction, by the way). It is more closely related to these variables than the mere number of BONEs received.

Figure 9 shows the differences in satisfaction between those who felt that Bones had been applied somewhat helpfully (above the median) and those who rated the quality of BONEs application in the lower 50%. The principal Morale factor variables were related. (Pay Satisfaction was not, however, significantly related.) Thus, the way in which supervisors presented and discussed BONEs with their subordinates affected morale. Supervisory Communication variables also showed quite high relationships with this quality variable. We will not present numerous graphs to illustrate that this was an effect over and above that of mere presentation of some BONEs. Suffice it to say that the additional impact of quality was indeed significant.

D. Causes of Differences between BONEs and No BONEs Groups: Detective Story Continued

One major source of large differences in the drop in scores is clearly associated with BONEs. The BONEs themselves did not necessarily cause these differences. The only demonstrated fact is that those employees whose supervisors used BONEs and used them with reasonable quality of presentation and discussion showed higher Morale and reported greater Supervisory Communication. Before we jump to the conclusion that proper administration of BONEs significantly reduced the effect of the overall degeneration of morale, we need to check alternative explanations. Because the simple BONEs-No BONEs comparison is more objective than the quality of BONEs measure, we will use this against which to check other effects.

1. Demographics.

a. Education. Educational level was significantly higher for the BONEs than the No BONEs group. This is not surprising since the program was introduced first at the higher levels in the organization where formal

educational levels tend to be higher. It is possible that the more highly educated employees were more receptive to BONEs. However, the relationships between education and Morale and Supervisory Communication were so low and inconsistent that education cannot be a cause of the relationship between BONEs and Morale or Supervisory Communication.

b. Unit. There are differences in which units had been receiving BONEs from their supervisors, however, anonymity should be preserved. The major problem is really why they are receiving different frequencies of BONEs.

c. Schedule. The same points apply here, except that managers can be singled out as having received BONEs. Over 80% had received one or more BONEs. This group also was high on the Morale and Supervisory Communications factor.

It seemed important to make sure that the effect of BONEs was not due to the inclusion of Managers, so the analyses were repeated without them. Averages are less favorable, but differences between BONEs and No BONEs groups remain practically as large. Therefore, it is not the inclusion of managers which is responsible for the d fferences between those receiving and those not receiving BONEs.

d. Tenure. Since tenure was not related clearly to Morale or Supervisory Communication, it will not account for differences in the relation of these clusters to exposure to BONEs. Moreover, a great many of the managers were long-tenured, and their removal from the sample did not materially affect the relationship.

2. Transfers. This group did not differ significantly from others except for slightly higher scores on JIG and Identification with TVA. They also did not differ in the Perceived Quality of Administration of the BONEs system. They are not responsible for differences between BONEs and No BONEs groups.

3. Pay and Promotions. These variables, together with Recognition of Performance, form a cluster which is correlated with but distinguishable from both the overall Morale factor and the Supervisory Communication factor as described above. There are differences in satisfaction here which caused a cluster of variables to vary together. Could whatever caused that cluster (perceived inequity in salary policy, perceived failure to recognize performance, etc.) be responsible for the differences in the Morale and Supervisory Communication factors for the BONEs and No BONEs groups? We needed to statistically "get rid" of the effects of pay to see how the size of other relationships was affected. The statistical tool for doing this is partial correlation.

Essentially, we "corrected" all scores so that everyone was equal in Pay Satisfaction. We then recomputed all correlations. We expected substantially lower relationships between number of BONEs and the variables in the Morale cluster as well as those in the Supervisory Communication cluster. Surprisingly, not a single correlation decreased! It is as if Pay Satisfaction consisted of two parts, one related to perceived pay inequities and the other a spill-over from general morale. Removing the first part has no effect on the other.

It is very evident in any case that the relationship between exposure to the intervention and satisfactions is not caused by differences in Pay Satisfaction.

This does not mean that pay is not an important source of dissatisfaction. Indeed, it is an increasingly sore point with many employees. Up to now, however, it is operating independently of the BONEs system, and of the general deterioration in morale.

4. Changes that have occurred at Watts Bar. Again, we need to check whether changes other than the introduction of BONEs could be responsible for obtained differences.

a. Orientation Program. The answers to the questions about the usefulness of the orientation program (Q. 245) were less favorable for the No BONEs group.

It seems extremely unlikely that having received BONEs would cause improved attitude toward the Orientation Program. Rather, whatever led supervisors to participate in the BONEs program also must have led to more receptiveness of the employees toward the Orientation Program. Whatever the cause, the correlations between Attitude toward Orientation and the Morale and Communication variables are not large, and the effects of the Program could apply only to new employees. The Program, though helpful for many, cannot be a major cause of BONEs -- No BONEs differences.

b. Good Neighbor Program. Both participation in and attitude toward the Good Neighbor Program are practically identical for the BONEs and No BONEs groups.

c. "Watts Happening". The same applies to attitude toward "Watts Happening". It is generally favorable for both groups.

d. Communications Committee. The non-significantly better reception of the committee by the BONEs group could not account for the large obtained differences in morale between BONEs groups.

e. Approach of plant to completion. One of the variables which changes in time as tasks changed, Perceived Task Variety, did not differ significantly between groups at

Post-test 2. The other, Autonomy, actually was lower for the BONEs group. Again, the changes in tasks as the plant nears completion cannot be a cause of differences between BONEs and No BONEs groups.

f. Clarification of Supervisory Responsibilities. There was a very slight non-significant difference between the BONEs and No BONEs groups on the improvement (since July) of sureness about responsibility of supervisor. There was, however, a 10% difference (25% versus 35%) in the percent of employees reporting that they were still unsure.

Percentages can be deceiving. The difference in favor of the BONEs group in actual number reporting unsureness was only 36 employees! Clarity of Supervisory Responsibi ity is no longer responsible for an important proportion of the differences in Morale between BONEs and No BONEs groups. It cannot, for the same reasons, account for differences in the variables grouped under Supervisory Communication.

g. BARS. Little has been said about BARS. Only a few people felt that they had been used meaningfully. Of course, these were more frequent among those who had received BONEs. It appears that BARS were not generally used effectively at WBNP.

SUMMARY AND RECOMMENDATIONS

The most startling finding of this report is the continued seriousness of the morale problem at all levels at WBNP. Job satisfactions are substantially below national norms, and have declined since July. Trust in Management, Identification with TVA, and other indices of morale such as Intention to Quit have also seriously deteriorated from an already unsatisfactory level.

Supervisory Communication has lost almost all the ground it had gained by the time of the first Post-test, despite efforts to clarify supervisory responsibilities and improve communication. It is now approximately where it was at the time of the Pretest.

The declines are in the averages of all employees. They have not occurred in all individuals, units, or schedules. We have ruled out some possible causes of the declines after examination of the data. Individual characteristics such as education, as well as such changes that have occurred at WBNP such as the introduction of various programs, cannot have caused the decline among many individuals.

There is considerable discontent about pay and promotions, particularly where there has been a wage freeze or where different schedules have allegedly been applied at different levels or for new as compared with longer-tenured employees. These sources must be explored and the situation either corrected or clarified. But analysis shows that this area is not at the heart of the problem. The major problem, we believe, is the mistrust in management apparent in the initial survey.

Classification system

Perhaps the most important asset at Watts Bar which was uncovered by the present report was the continued and increasing positive feelings and trust for fellow employees. These feelings continue despite loss of trust in management. They may actually have been enhanced as the employees considered themselves more and more as "We"; and management, (including any outside consultants) as "They." It has been demonstrated repeatedly in a variety of other situations that the greater the inward solidarity of a group, the greater is its hostility towards "outsiders." Although there are complaints about "deadwood," the majority of employees have more confidence in each other than in management.

Inconsistent with feedback

Regardless of the origins of this "in-group" feeling, it should be used for the benefit of the employees and the organization. There were numerous statements from employees outlining in thoughtful detail the problems and solutions they saw at Watts Bar. These employees said that they would be pleased to discuss their observations and concerns with responsible management. They, are [illegible] not now using the Communication Committee to do so, perhaps because it does not

reach decision makers with enough impact or perhaps because it is perceived as just another gripe session.

To build on employee goodwill toward one another, there must be real participation, and, to quote, employees must cease to feel they are "treated condescendingly" or "as children."

"Participation" can be perceived merely as a buzz word. It cannot have real effects unless (1) what employees say really matters to management and employees believe that to be true, and (2) what employees say really matters to each other. One of the reasons participation has not been effective at WBNP in the past is that neither of these two critical ingredients were present. Now, at this point, the second ingredient is already present. It is time to tap the resource of positive in-group feelings. Participation involves some apparent relinquishing of power by management, but buys the power that can be gained by the support of the group.

If peers participate with their supervisor in decisions or recommendations for decisions which affect them, the supervisor gains power. If he/she in turn participates with peers and superiors at the next level, and so on, the entire chain will be strengthened. This does not mean endless meetings; informal leaders can make sure that supervisors have obtained the sense of their group. There will be informal leaders already "chosen" by the group whenever there is sufficient solidarity for participation to operate. We strongly recommend that management utilize the resource of employee confidence in co-workers.

Supervisors' responsibilities have been somewhat clarified, according to the employees, although there are still problems which must be pursued. It is especially important that employees believe that their immediate supervisors' observations are transmitted to and believed by higher levels.

A major surprise in the present report is that supervisory Communication is still approximately the same as it was at the time of the Pretest. Why hasn't it deteriorated from the Pretest, and why hasn't it lost more ground since the first Post-test? Favorable recognition seems to be in order for certain supervisors who have maintained good relations with their subordinates and strong identification with the company. These supervisors also appear to have used BONEs effectively; some of them also appear to have used BARS in a way that the employees understood them. We do not wish to try to identify these supervisors individually, but as a group their subordinates can be found in the group who have received BONEs. Subordinates of these supervisors showed less decline in morale and an actual improvement in Satisfaction with Supervision, with Co-workers, Trust in Management and in Fellow Employees, Goal Clarity, Goal-setting Feedback, and Job Definition.

Those supervisors who feel that they are working in an atmosphere of reasonable mutual trust may want to institute an informal procedure of making notes on job-relevant behavior --favorable and unfavorable-- and keep notations on their discussions with employees. Without some system, it is only natural to forget to communicate about observed behavior, particularly when it is not extreme. In view of the strong reaction against the way BONEs were used, it seems wise to abandon the term BONEs as well as the forms, and to substitute for example, a pocket notebook. It must be emphasized that it is not the format of BONEs, (or the name) that is important, but rather the careful objective, observation, and recording of behavior. This observation can become a habit which continues to aid the supervisor whatever form he uses. The supervisor should, however, set himself a schedule so that all employees are observed and talked with at frequent intervals.

Post-test 1 showed that consistent improvement accompanied use of BONEs. Even those supervisors who feel that their previous use was ineffective should re-examine their communication procedures to see if they too could profit from use of a modified procedure under another name. For BONEs to be effective, apparently the prime prerequisite is trust in management.

The necessity for trust before BONEs/BARS can be effective can be illustrated by an employee's thoughtful comment:

> "In conversation with fellow employees, I hear constant joking about BONEs, i.e. 'BONEs are for dogs.' With this attitude no program will work. This attitude is not toward the program, I feel, but toward managers, because nothing will alter their decisions or behavior toward subordinates. Thanks for your time and trouble, but without better management practices, this organization is doomed."

We do not feel that the situation is entirely hopeless. If managers try to strengthen their lines of two-way communication with subordinates, the direction of change can be shifted.

The operation of observation of behavior by the supervisor should not be isolated from consultation with the employees alone or as a group. The trust in fellow employees can spread to management if and when management is seen as valuing employees' opinions.

Comments about management's treating employees condescendingly indicates that many employees feel that management does not trust them to make decisions. Lack of trust in one direction breeds lack of trust in the other.

Salary policy is still a very sore point. It should be examined carefully, so that at least a clearer statement of policy and reasons for it can be issued. Otherwise, that particular pocket of discontent is likely to spread and lead to further deterioration in morale.

Management has a major task ahead in restoring trust. Fortunately, however, trust in fellow employees has remained fairly high throughout. If participation can be increased, if policies can be clearly stated and rigorously followed, and if employees know that stated policy is actually in effect, they will begin to trust management's motives and management's word. Unless management recognizes the importance of what employees have to say and the positive value of employees' mutual trust, then every managerial action will be viewed with mistrust and any action toward a particular individual will ripple, or spread its effect to other employees.

FIGURE 1

SCHEMATIC OUTLINE OF VARIABLES INCLUDED IN STUDY OF WATTS BAR NUCLEAR PLANT BY SURVEY

AUGUST, 1981

Input Variables

Job Characteristics Inventory:
- Autonomy
- Variety
- Feedback
- Task Identity

Scales Designed for Watts Bar Nuclear Plant
- Job Definition
- Recognition of Performance
- Merit Payment
- Communication Concerning Work Changes

Goal-setting Attributes
- Goal Clarity and Planning
- Goal-setting Feedback and Evaluation
- Participation in Goal-setting

Personal Characteristics

Relatively Permanent Characteristics:
- Age
- Sex
- Race
- Education
- Tenure at WBNP

Potentially Modifiable Characteristics:
- Survey of Attitude toward Work Autonomy
- Survey of Individual Goal Orientations
- Interest in Work Innovation Index
- Social Desirability Scale
- Survey of Life Satisfaction

Outcome Measures

Measures of Satisfaction and Morale:
- Job Descriptive Index
  - Work
  - Pay
  - Promotional Opportunities
  - Supervision
  - Co-Workers
- Job in General
- Survey of Life Satisfaction

Intention to Quit

Comment on the Questionnaire

Trust
- In Management
- In Fellow Employees

Identification with the Work Organization Index

Acceptance of Job Changes Index

Interest in Work Innovation Index

Controls:
- Social Desirability Scale
- Sex
- Race
- Age
- Education
- Tenure at Watts Bar Nuclear Plant

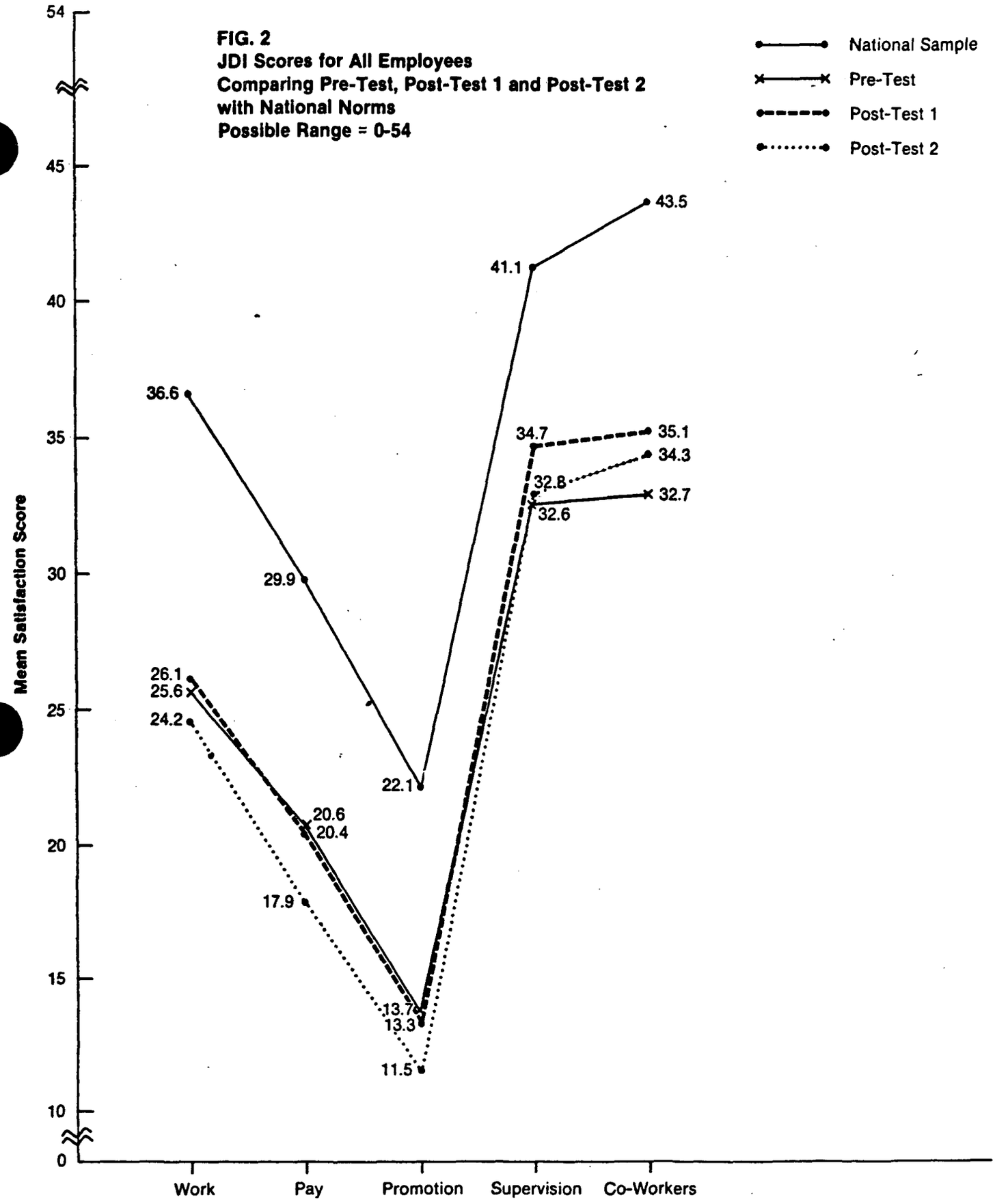


FIG. 2
JDI Scores for All Employees
Comparing Pre-Test, Post-Test 1 and Post-Test 2
with National Norms
Possible Range = 0-54
National Sample
Pre-Test
Post-Test 1
Post-Test 2
Mean Satisfaction Score
54
45
40
35
30
25
20
15
10
0
36.6
29.9
22.1
41.1
43.5
26.1
25.6
24.2
20.6
20.4
17.9
13.7
13.3
11.5
34.7
35.1
34.3
32.8
32.7
32.6
Work
Pay
Promotion
Supervision
Co-Workers
JDI SCALE

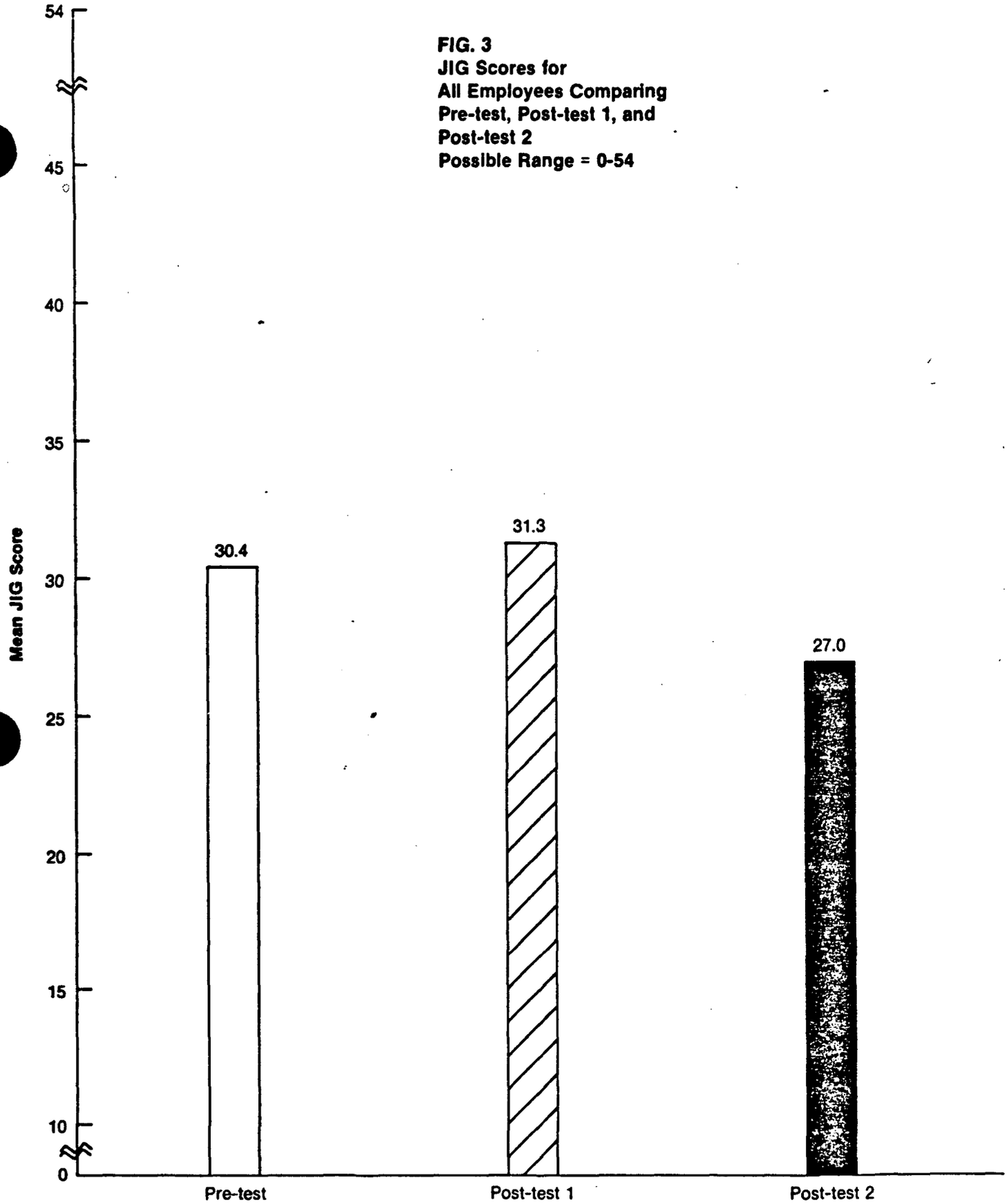


FIG. 3
JIG Scores for All Employees Comparing Pre-test, Post-test 1, and Post-test 2
Possible Range = 0-54

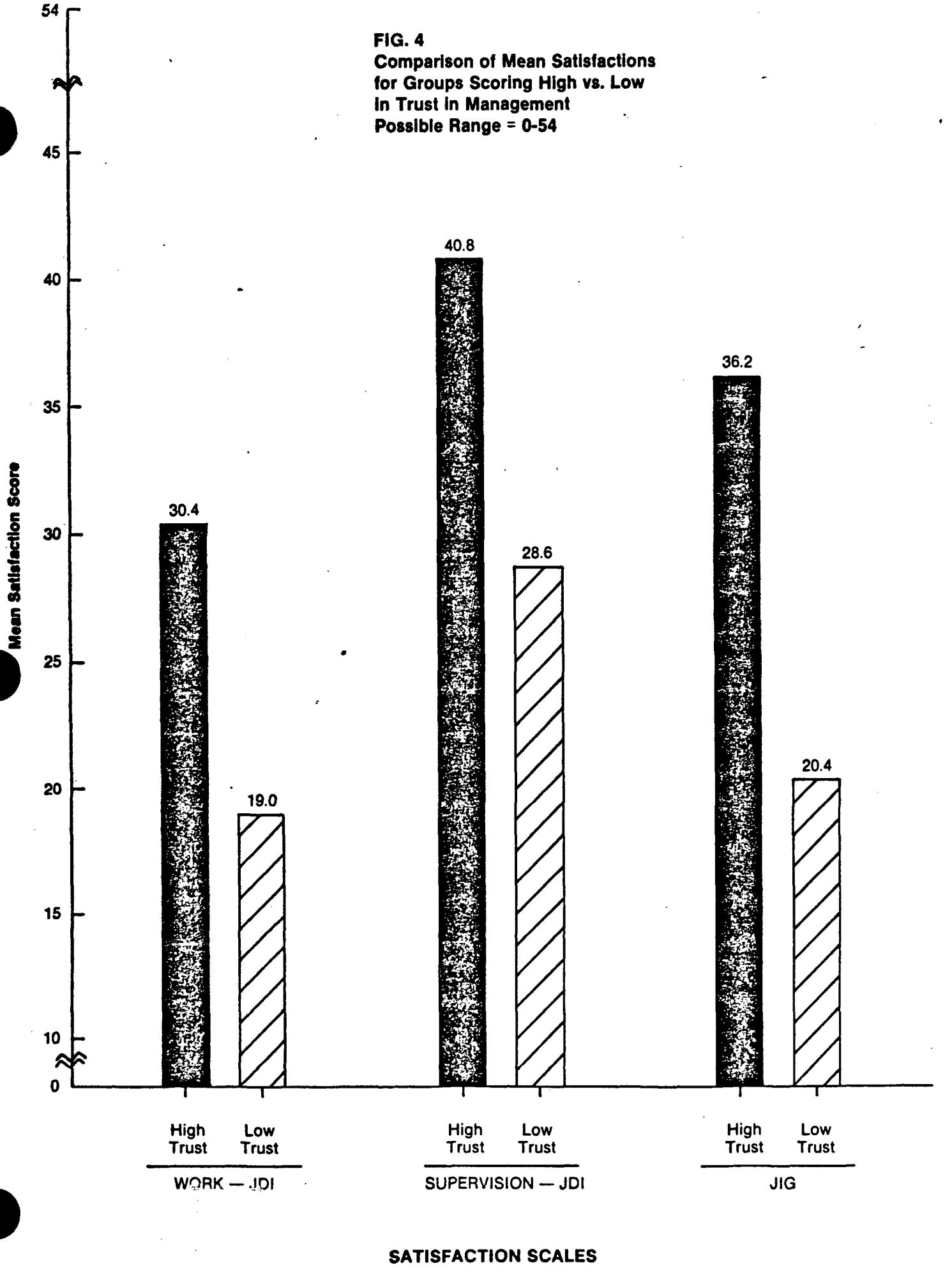
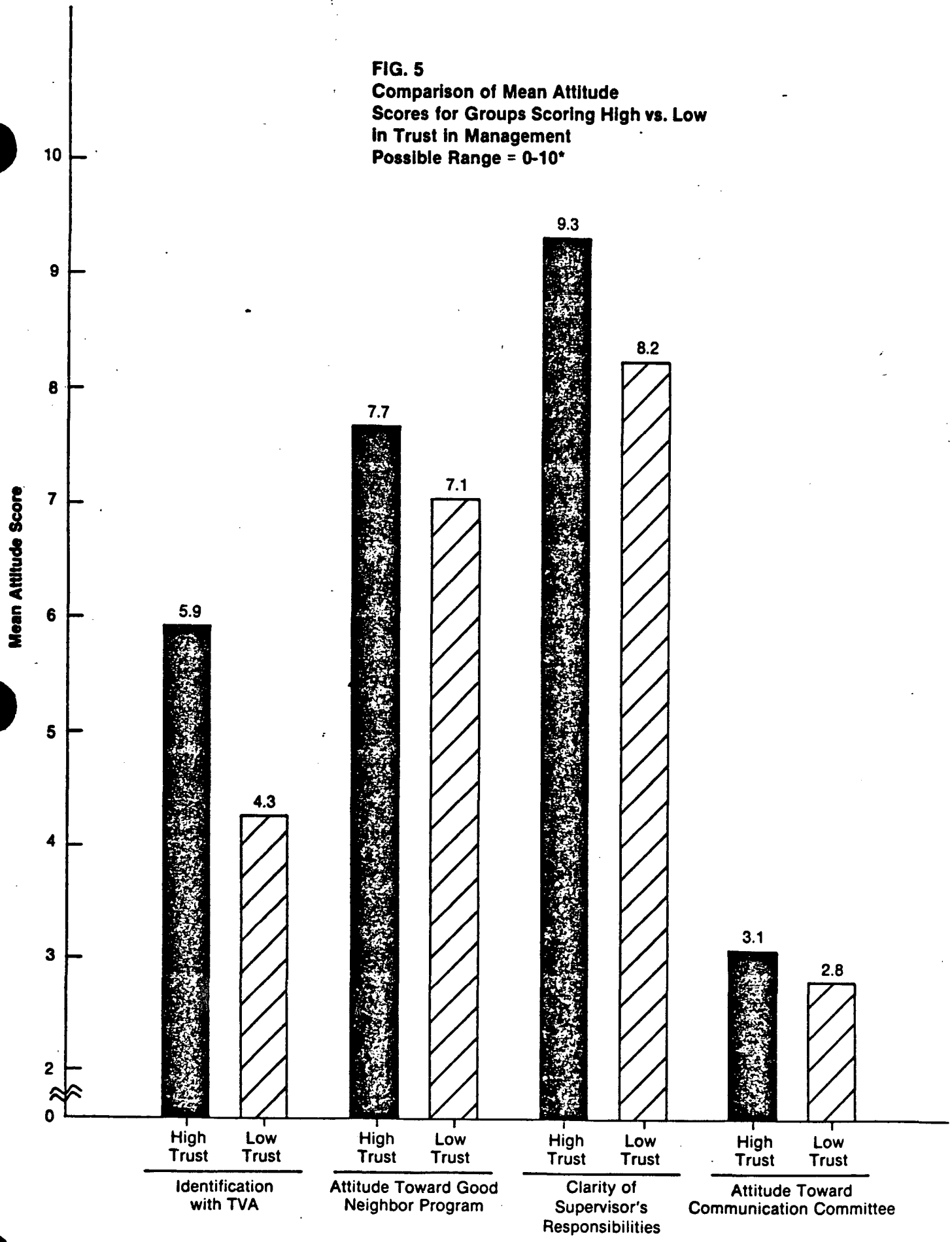


FIG. 4
Comparison of Mean Satisfactions for Groups Scoring High vs. Low in Trust in Management
Possible Range = 0-54

FIG. 5
Comparison of Mean Attitude Scores for Groups Scoring High vs. Low in Trust in Management
Possible Range = 0-10*



*All scales have been converted to a common scale for comparability.

FIG. 6
Comparison of Mean Satisfactions for Groups Scoring Low vs. High in Intention to Quit
Possible Range = 0-54

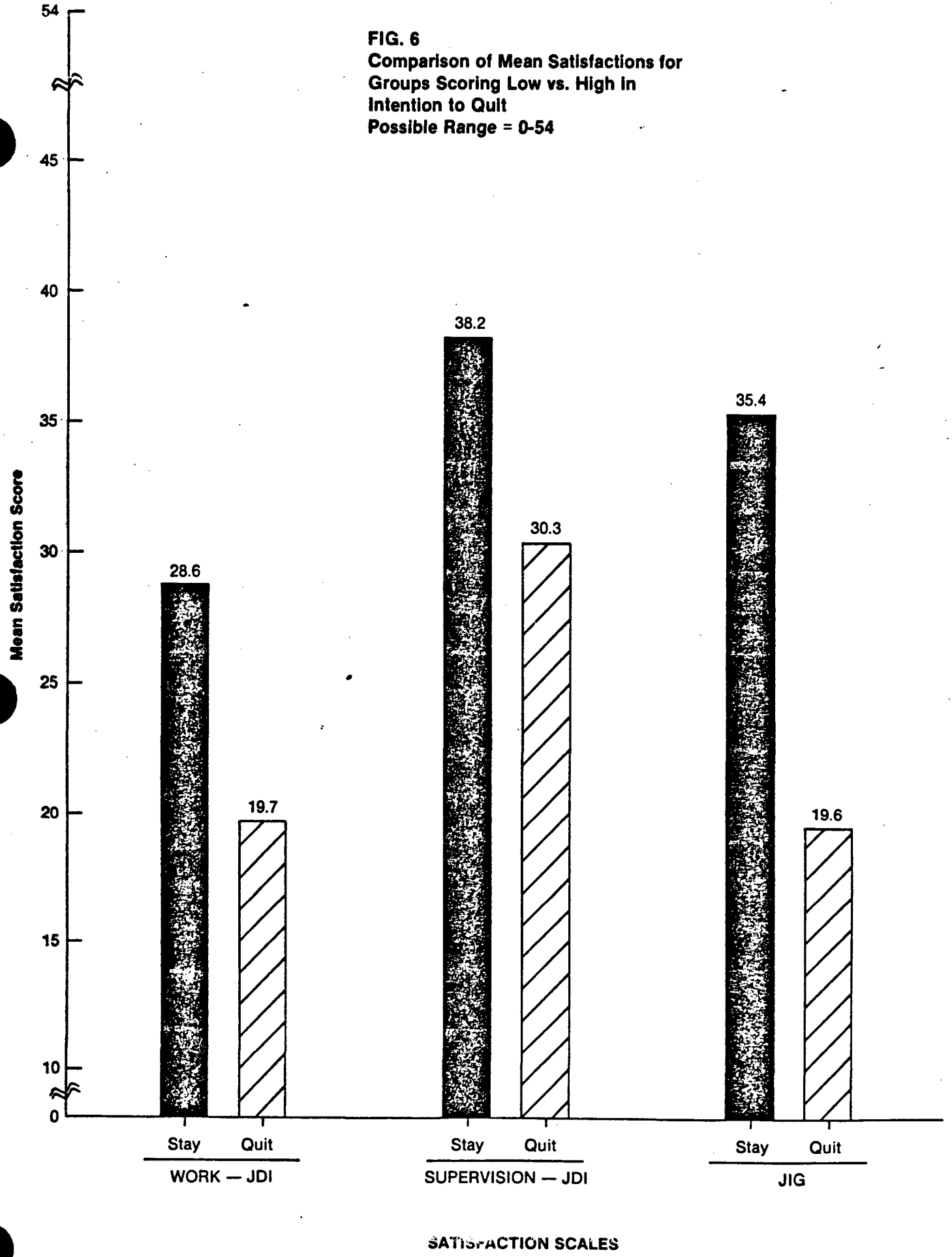
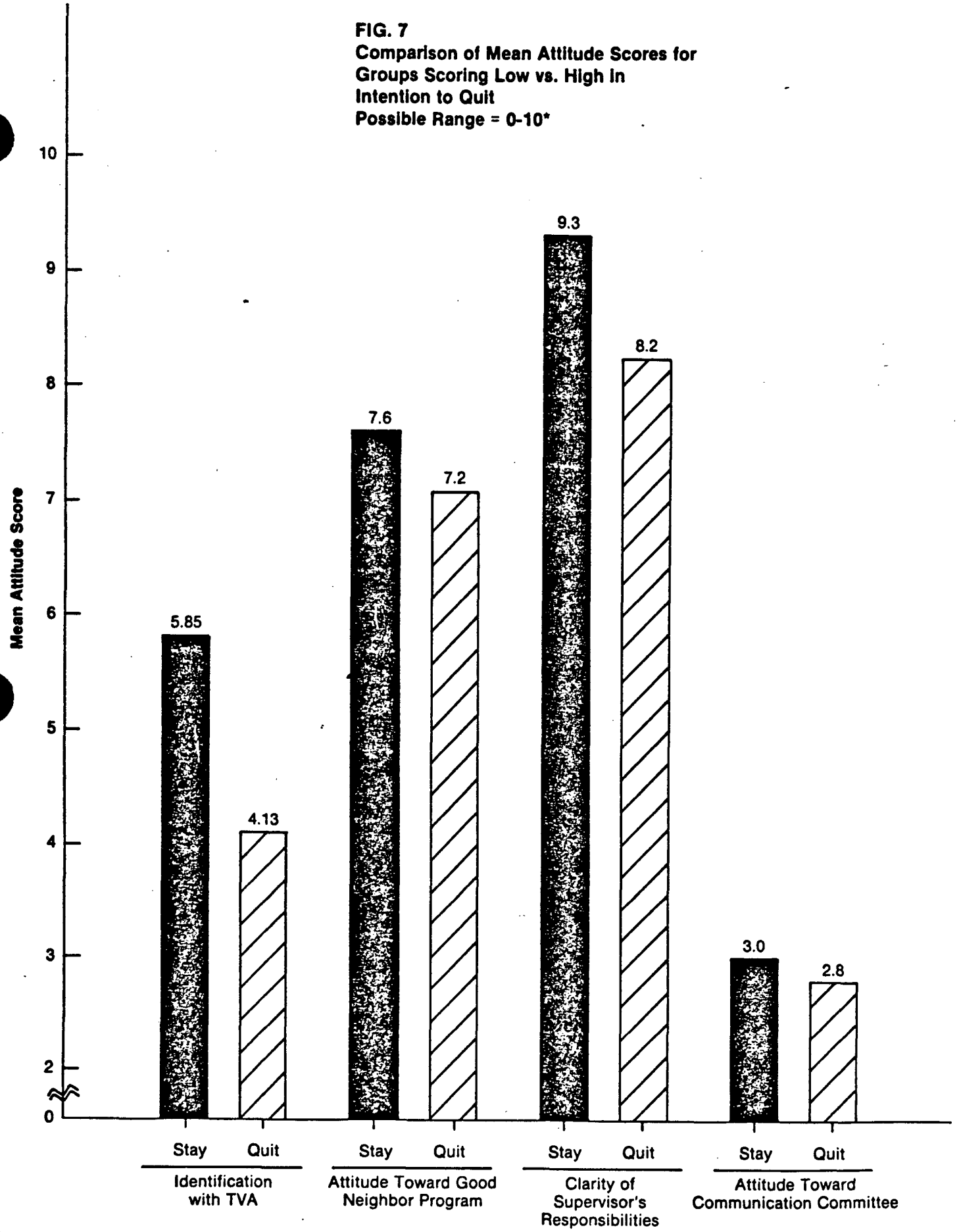


FIG. 7
Comparison of Mean Attitude Scores for Groups Scoring Low vs. High in Intention to Quit
Possible Range = 0-10*



*All scales have been converted to a common scale for comparability.

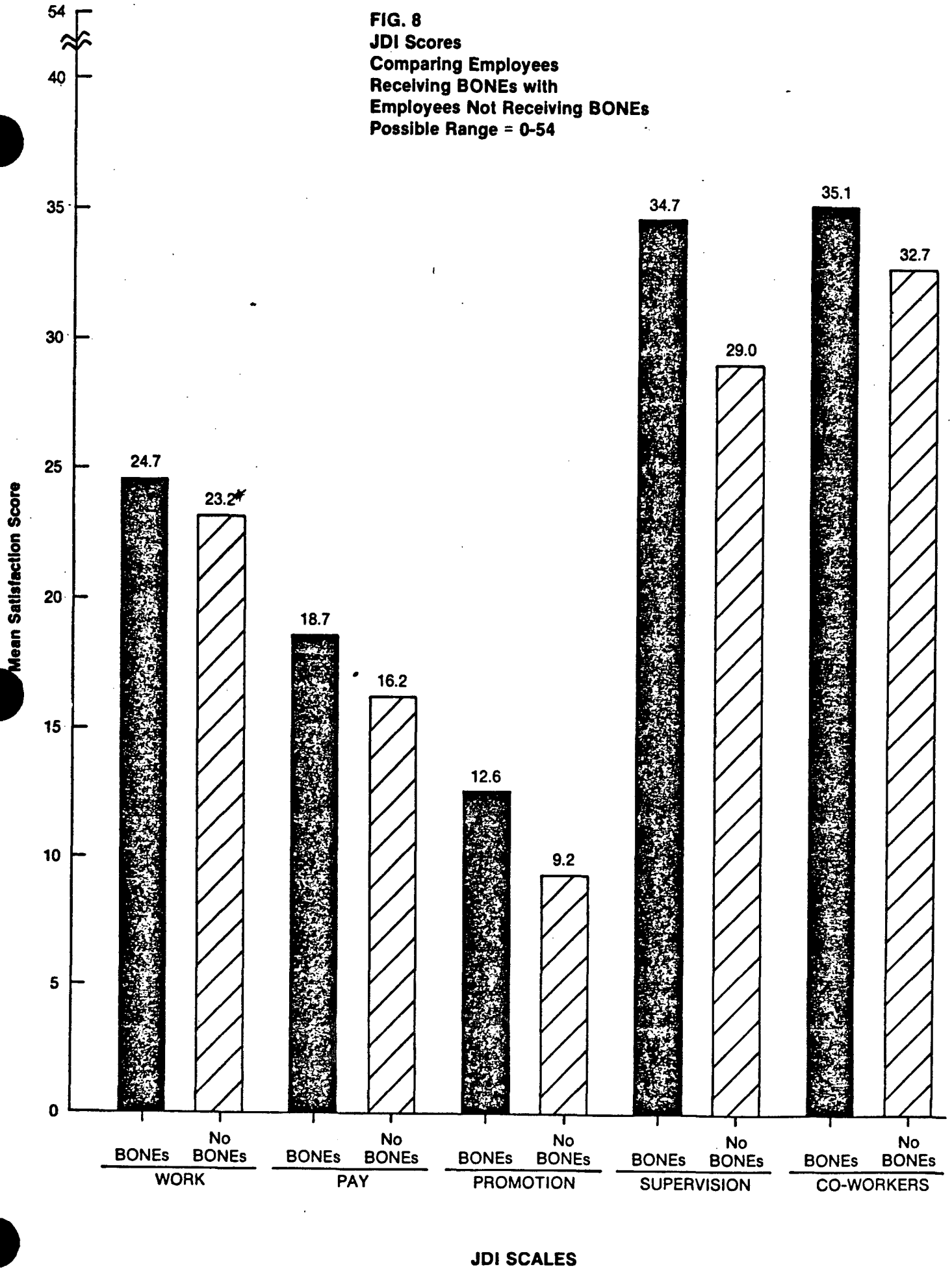


FIG. 8
JDI Scores
Comparing Employees
Receiving BONEs with
Employees Not Receiving BONEs
Possible Range = 0-54

*This difference could have occurred by chance

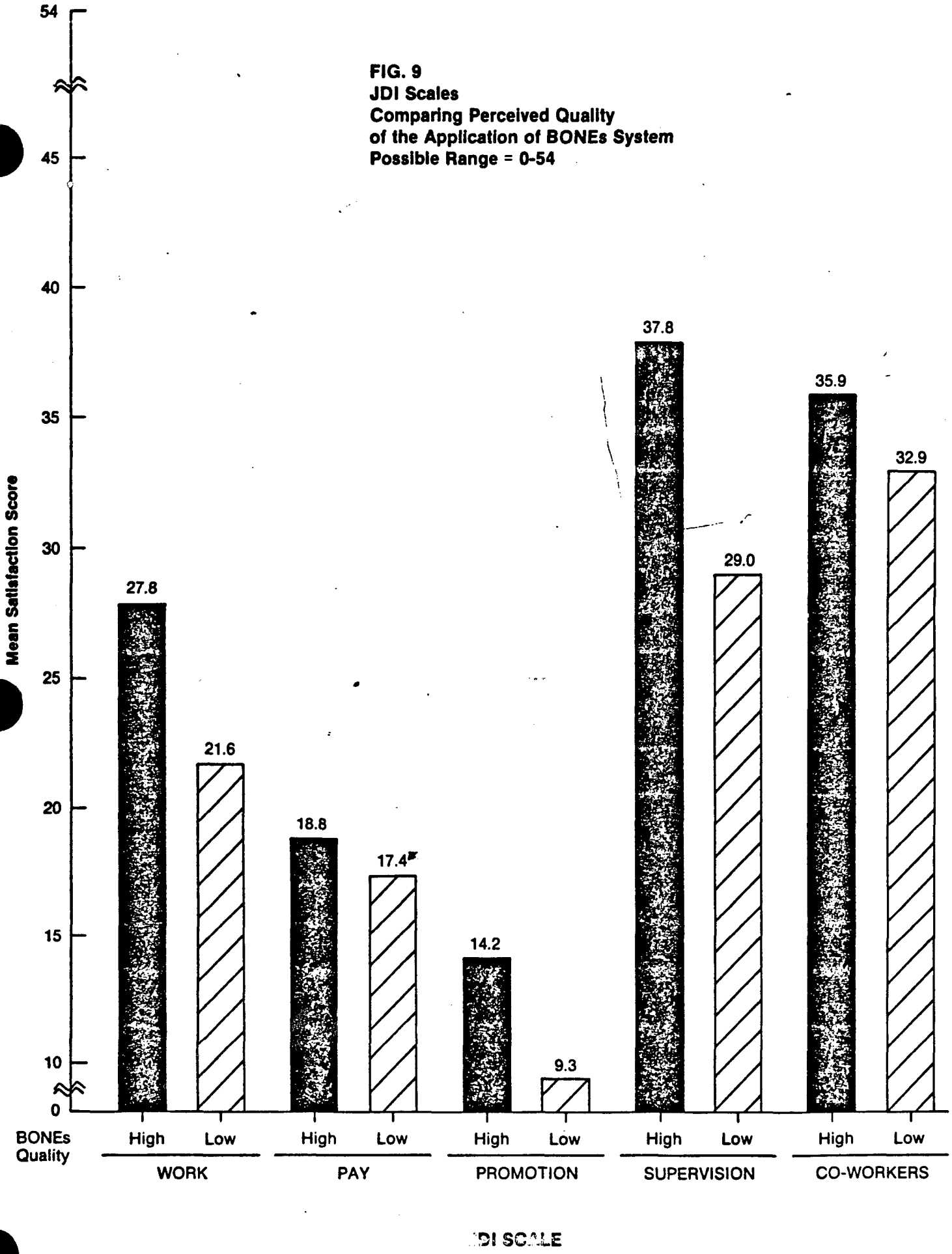


FIG. 9
JDI Scales
Comparing Perceived Quality
of the Application of BONEs System
Possible Range = 0-54

*This difference could have occurred by chance

EMPLOYEE SURVEY

WATTS BAR NUCLEAR PLANT

Administration Number 3

Developed for WBNP by

Bowling Green State University

Bowling Green Industrial Relations Center

Box 711

Bowling Green, Ohio 43402

Confidential

This questionnaire is considered confidential and you will not be personally identified.

Instructions

Please respond to the following questions by filling in the appropriate circle on the enclosed NCS answer sheet. On questions which call for *your own* opinion, please bear in mind that there are no right or wrong answers. Do not omit any questions. Please use a No. 2 or darker pencil. Be sure to give only one answer to each of the statements. Make no marks except as specifically instructed. There are places for only 200 responses on your answer sheets. Therefore, when you reach 200, you will start the second answer sheet; the subsequent questions are again numbered beginning with 1.

People on Your Present Job

Think of the majority of people that you work with now or the people you meet in connection with your work. How well does each of the following words describe these people? Consider each word and darken the answer sheet with

"A" for "Yes" if it describes the people you work with

"B" for "No" if it does NOT describe them

"C" if you cannot decide

55. Stimulating
56. Boring
57. Slow
58. Ambitious
59. Stupid
60. Responsible
61. Fast
62. Intelligent
63. Easy to make enemies
64. Talk too much
65. Smart
66. Lazy
67. Unpleasant
68. No privacy
69. Active
70. Narrow interests
71. Loyal
72. Hard to meet

Job in General

Think of your job in general. What was it like most of the time? Consider each word given below and darken the answer sheet with

"A" for "Yes" if it describes your work

"B" for "No" if it does NOT describe it

"C" if you cannot decide

73. Comfortable
74. Inferior
75. Gratifying
76. Enjoyable
77. Poor
78. Discouraging
79. Inadequate
80. First rate
81. Disagreeable
82. Would like to leave
83. Worthwhile
84. Undesirable
85. Good
86. Better than most
87. Desirable
88. Fulfilling
89. Bad
90. Pleasant

Scale of Life Satisfaction

Now think of your life in general. Considering all aspects important to you, both work and nonwork, what is it like most of the time? Consider each word and darken the answer sheet with

"A" for "Yes" if it describes your life

"B" for "No" if it does NOT describe it

"C" if you cannot decide

91. Brings out the best in me
92. Disappointing
93. Secure
94. Full of gripes
95. Content
96. Miserable
97. Satisfying
98. Would like to relive my life differently
99. Meaningful
100. Feel loved

GO TO SIDE 2 OF ANSWER SHEET

101. Got a raw deal from life
102. I feel good about myself
103. Pleasant
104. Depressed
105. Happy
106. Discouraged
107. Full
108. Boring

Please go on to next page.

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A = Strongly agree
B = Agree
C = Uncertain
D = Disagree
E = Strongly disagree

130. To me, the line of work (occupation) I'm in is only a small part of who I am.

131. I am very much involved personally in my line of work.

132. Most of my own life goals are oriented towards my line of work.

133. I am committed to my line of work.

Now think about the way you believe people should feel:

134. Work should be considered central to life.

135. Almost everything a person does should revolve around his or her job.

136. A person should live, eat, and breathe his or her job.

137. Most things in life are more important than work.

138. One should be committed to his or her job.

139. A person should be proud to tell others he or she is part of his or her organization.

140. An individual should be loyal to his or her organization.

141. One should not criticize his or her organization.

142. A person should talk up his or her organization to friends as a great organization to work for.

143. A worker should make sacrifices on his or her organization's behalf.

144. In my view, an individual's own life goals should be oriented toward his or her line of work (occupation).

145. A person's line of work should be only a small part of one's life.

146. One should be very much involved personally in his or her line of work.

147. A person should be committed to his or her line of work.

148. From time to time, changes in policies, procedures, and equipment are introduced by the management. How often do these changes lead to better ways of doing things?
A. Changes of this kind never improve things
B. They seldom do
C. About half the time they do
D. Most of the time they do
E. Changes of this kind are always an improvement

149. In general, how do you now feel about changes during the past year that affected the way your job is done? (If you feel there have been no changes in the past year, don't answer this question.)
A. Made things somewhat worse
B. Not improved things at all
C. Not improved things very much
D. Improved things somewhat
E. Been a big improvement

150. During the past year when changes were introduced that affected the way your job was done, how did you feel about them at first? (If there have been no changes in the past year, don't answer this question.)
A. Made things somewhat worse
B. Not improved things at all
C. Not improved things very much
D. Improved things somewhat
E. Been a big improvement

Instructions: Please read each statement and decide whether you (A) Strongly agree, (B) Agree, (C) are Uncertain, (D) Disagree, and (E) Strongly disagree with the statement.

A = Strongly agree
B = Agree
C = Uncertain
D = Disagree
E = Strongly disagree

174. Good performance at TVA is rewarded by praise and recognition.

175. Good performance at TVA is rewarded by pay increases.

176. Appropriate action is taken when employees do not perform adequately.

177. My supervisor knows the reasons behind job-related changes.

178. My supervisor tells me the reasons for job-related changes.

179. Public resentment of TVA is largely based upon the feeling that TVA employees are paid well for wasting time.

180. I personally believe in TVA and its objectives.

181. Management at Watts Bar is sincere in its attempts to meet the employees' point of view.

182. Watts Bar has a poor future unless it can attract better managers.

183. If I got into difficulties at work, I know my fellow employees would try to help me out.

184. Management can be trusted to make sensible decisions for the future of Watts Bar.

185. I can trust the people I work with to give me a hand if I need it.

186. Management at work seems to do an efficient job.

187. I feel quite confident that management will always try to treat me fairly.

188. Most of my fellow employees can be relied upon to do what they say they will do.

189. I have full confidence in the skills of my fellow employees.

190. Most of my fellow employees would continue to do their work even if supervisors were not around.

191. I can rely on other employees not to make my job more difficult by careless work.

192. Our management would be likely to take advantage by deceiving the employees.

Bone 193. My supervisor discusses with me the BONEs he or she has written about me.

Bone 194. BONEs have helped me communicate with my supervisor.

Bone 195. In general, the BONEs I've received have been helpful.

Bone 196. The discussions with my supervisor regarding BONEs written about me are constructive.

BARS 197. I know how to rate a BONE using the BARS (Behaviorally Anchored Rating Scales).

BARS 198. The BONEs are more meaningful to me now that the BARS system is being used.

BARS 199. My supervisor rates the BONEs on BARS before discussing BONEs with me.

Bone 200. My supervisor discusses with me the BONEs I have written.

18-19. What is your schedule?

18. (A) SA
18. (B) SB
18. (C) SD
18. (D) SE

19. (A) SF
19. (B) M
19. (C) T&L
19. (D) Job Shopper

20-24. What is your work unit? (Please choose one answer for questions 20-24. If on loan, indicate the unit to which you are assigned.)

20. (A) Civil Engineering
20. (B) Civil Quality Control
20. (C) Electrical Engineering
20. (D) Electrical Quality Control

21. (A) Hanger Engineerng
21. (B) Hanger Quality Control
21. (C) Instrumentation Engineering
21. (D) Instrumentation Quality Control

22. (A) Mechanical Engineering A
22. (B) Mechanical Engineering B
22. (C) Mechanical Quality Control
22. (D) Quality Control & Records

23. (A) Startup, Testing, & Coordination
23. (B) Welding Engineering
23. (C) Welding Quality Control
23. (D) Construction Superintendent's Section

24. (A) Project Services
24. (B) Project Controls
24. (C) Management Systems
24. (D) Warehouse
24. (E) Other

25-26. What is your educational background?

25. (A) High school
25. (B) Some college
25. (C) 2-year technical degree

26. (A) Associate degree
26. (B) College degree
26. (C) Graduate degree

27. How long have you been at WBNP?
A. Less than one year B. 1-3 years C. 4-7 years D. 8 or more years

28. How long have you worked for TVA?
A. Less than one year B. 1-3 years C. 4-7 years D. 8-11 years
E. 12 or more years

29. What is your age?
A. 18-26 years B. 27-34 years C. 35-41 years D. 42-48 years E. 49 or older

30. What is your sex?
A. Male B. Female

31. In what month did you receive your first BONE?
A. Before January B. Jan-Feb C. March-April D. May or later
E. I have not received a BONE

32. During the past several months, estimate the number of BONEs you have received per month.
A. 0 per month B. 1-2 per month C. 3-5 per month D. 6-10 per month
E. 11 or more per month

33. If you supervise, how many of the BONEs you have written during the last few months have you rated using BARS?
A. 0 per month B. 1-2 per month C. 3-5 per month D. 6-10 per month
E. 11 or more per month

34. The first form of this questionnaire was first administered in the late summer of 1981. Did you fill one out then?
A. Yes B. No C. Not employed at Watts Bar in summer 1981

35. The second form of this questionnaire was administered in July 1982. Did you fill one out then?
A. Yes B. No C. Not employed at Watts Bar in summer 1981

36. Considering everything, would you say you are now more satisfied or less satisfied with your job than you were in July? (If not employed in July, do not answer.)
A. Much less satisfied now
B. Somewhat less satisfied now
C. Just as satisfied now as in July
D. Somewhat more satisfied now
E. Much more satisfied now

51. Have you ever used the committee to express an opinion or to gain information?
A. Yes B. No

52. Would you use the committee if you had a need?
A. Yes B. No

53. How informed are you as to the activities of the committee?
A. Not at all B. Somewhat C. Greatly

54. Is there any way in which your particular situation at Watts Bar could be improved?
A. Yes B. No

Explain on the bottom of this sheet (not on the NCS answer sheet). Use additional sheets if required.

We appreciate your effort in completing this questionnaire. The information gained will help us plot a better future course for Watts Bar. However, we are especially interested in changes in attitude that have occurred in the past five months, since the last questionnaire was administered in July 1982. If you feel that you have experienced significant change in work on your job, supervision, opportunities for promotion, people on your job, or your job in general, please answer the questions in the applicable section(s) below. Your extra effort is greatly appreciated.

Think of the job you held at Watts Bar in July 1982. Please describe your job by answering these items as you would have then.

Listed below are words which may or may not have described an aspect of your job five months ago. On the answer sheet, darken the "A" for "Yes" if it described the aspect, darken "B" for "No" if it did not describe the aspect, and darken "C" if you could not decide.

Work on Your Job in July

Think of your work in July. What was it like most of the time? Consider each word given below, and darken the answer sheet with

"A" for "Yes" if it described your work

"B" for "No" if it did NOT describe it

"C" if you could not decide

55. Fascinating
56. Routine
57. Satisfying
58. Boring
59. Good
60. Creative
61. Respected
62. Hot
63. Pleasant
64. Useful
65. Tiresome
66. Healthful
67. Challenging
68. On your feet
69. Frustrating
70. Simple
71. Endless
72. Gives sense of accomplishment

Pay in July

Think of the pay you got in July. How well did each of the following words describe your pay then? Consider each word and darken the answer sheet with

"A" for "Yes" if it described pay then

"B" for "No" if it did NOT describe it

"C" if you could not decide

73. Income adequate for normal expenses
74. Satisfactory profit sharing
75. Barely live on income
76. Bad
77. Income provides luxuries
78. Insecure
79. Less than I deserve
80. Highly paid
81. Underpaid

INFORMATION FOR COD. NUMBER

Your answers to this questionnaire will be anonymous and confidential. The results will be presented statistically for various study groups, not by individuals. However, we want to match your responses to this questionnaire with your responses to the questionnaires given last year to discover any change in situation or attitude. So we have worked out a plan for you to develop your own unique code number to allow us to match the responses of each respondent. Remember, the code number will allow the grouping of responses from an individual but will not identify that person by name or position.

(1) Think of the year of your birth. Add the last two digits of that number. For example, if you were born in 1908, the total would be 0+8=8. If you were born in 1949, the total would be 4+9=13. Enter the number here .....

(2) Think of the day of the month of your birthday (e.g., the 14th). Add those two digits (e.g., 1+4=5). If your birthday was on the 4th, 0+4=4. Enter the number here .....

(3) What is the third letter of your last name (e.g., Smith, enter "i"). Enter the letter here .....

Please make any other comments you would like to make regarding your job, Watts Bar, and TVA at the bottom of this sheet or on additional sheets if necessary.

Please place both answer sheets (and any additional sheets) in the questionnaire booklet and give it to your unit secretary or general foreman for forwarding to Don Barksdale, Project Manager's Office, by December 3, 1982.

Thank you very much for your assistance.

APPENDIX A
TABLE 1

Content Analysis of General Comments (Question 254)

Category:

BONES/BARS/CONSULTANTS

Frequency*	
42	BONEs is useless/waste of time or money
40	Survey is waste of time or money
16	Consultants rip off TVA
15	Disagree with interpretations
9	Wrong people doing BONEs
8	"Hate" BONEs or get rid of ASAP
7	BONEs is a joke/BS
6	Distrust confidentiality/anonymity
3	BONEs is tool of money-makers
2	Lack of implementation
2	Difficulty in observing behavior
2	BARS too complex
1	BONEs used to screw employees
1	Problems are beyond BONEs
1	No BONEs class
1	BONEs reduces respect for supervision
1	Management should also fill out survey

152 total (Some respondents included more than once)

MANAGEMENT AND SUPERVISION

14	Subordinates treated condescendingly; with lack of respect; child-like
10	Inadequate supervisor knowledge of subordinate job
7	Mistrust in upper level management
6	Placing blame on others for inadequacies/mistakes
6	Buddy system; "ass kissers"
6	Overall--management is "poor"
6	Lack of professionalism in managers/supervisors
5	Subordinates "cover ass" of supervisors
4	Inadequate manager training
3	Management unresponsive
3	No communication between management subordinates

3	Supervisors let personal feelings get in the way of work decisions
3	Don't know boss or supervisor
3	Harassment by management of subordinate (esp. trivial matters)
3	Too many chiefs
2	Management shirks responsibilities
2	Lack of management unity
2	Supervisors untruthful
2	Chain of command bypassed
1	Lack of supervisor cordiality/friendliness
1	Lack of support from top management
1	Peter Principle
1	Lack of supervisory control
1	Supervisors alienate organizations or offices

95 total

MORALE

25	Low Morale
9	Intend to quit
8	Unhappy or dissatisfied
7	TVA used to be a good place
4	No improvement or change since July
4	"Economic conditions" as explanation is a cop out
2	No respect for TVA
1	Job now boring

60 total

PAY

29	Inadequate pay scale
15	Delays
14	New/old employees paid differently (inequitable)
6	Red-circling
5	Benefits too few
4	Different pay scales/raises (top gets more frequent)
1	Job performance not recognized ($)

75

COMMUNICATION

8	More feedback needed
6	Knoxville poor

4	Lack of verbal recognition
3	Lack of employee input into policies
2	Lack of communication between units
2	Write more effective, clear procedures
1	Use second hand information when first hand is available
1	Design people lack communication
1	Unclear job description
1	Learn of important decisions from media, not TVA
1	Arbitrary new rules

30 total

PROMOTION

9	Failure to promote on merit
8	Lack of opportunities
6	Failure to upgrade jo
3	Only top get promoted
2	Job dead-end (nowhere to go)
2	No redress on merit review

30 total

MISCELLANEOUS

9	Too much "deadwood"
8	Excessive paperwork
8	Fast-changing designs or priorities
4	Underemployed
4	Use same TVA standards as other plants
3	Job not secure
3	Transportation/shift time a problem
2	Need for organized training
2	TVA manipulates media
2	More effective goal-setting needed
1	Lack of career development
1	Time pressures too great
1	Job description ignored
1	Overtime demands excessive
1	GNP PR unfair
1	Improper placement of employees
1	Social programs not job-related; too much pressure
1	Ineffective accountability program
1	Lack of policy enforcement
1	Too much raising of rates (consumers')
1	Employees not cost-conscious
1	Locked in work area
1	Unhealthy [illegible]

1	Political decisions
1	Computer program PC-3 ineffective
1	Lack clerical support

61 total

POSITIVE COMMENTS

1	Now, work together better
1	General improvement
1	Like job
1	No real "problems"

* There may be two or more entries for one respondent

TABLE 2

Answers to Open-ended Questions about Orientation Program

What orientation information was most helpful:

9	Plant layout and plant tour
7	Didn't receive any
4	Office layout
3	Safety regulations
2	Information on WBNP policies and procedures
2	Extra courses that can be taken
1	Explanation of employee benefits
1	Rating employees with BONEs
1	Told of unit goals
1	Introduced to fellow employees

31 total

What additional information would be helpful:

7	Information related to specific job
3	Have orientation when first start, not six months later
3	What is expected of them by management, what they can expect of management
2	Instructed by supervisor daily for first few weeks
2	Explanation or organizational chart
2	Explanation of each unit and their responsibilities
2	Meet project manager and other head people
1	Explain proper personnel procedures
1	Explain security and safety regulations
1	Explain retirement savings plan
1	WBNP rules and regulations
1	Information about committees and special programs
1	Information about unions and TVA
1	Map of locations of disciplines
1	Personal conference with new supervisor
1	Follow training session with test on individual duties and responsibilities
1	Make training objectives clear
1	Give up-to-date status of work at WBNP

32 total

* There may be two or more entries for a single respondent.

APPENDIX B

DETAILED ANALYSIS OF POSSIBLE SOURCES OF DIFFERENCES IN MORALE AND SUPERVISORY COMMUNICATION

Explanation of "Preliminary Investigations", in Results and Discussion Section under Topic C-1 in text.

1. Demographic variables. Individual differences may affect the way people respond to the working situation (see Figure 1).

a. Education. The education of employees could be related to morale. The persons with higher levels of formal education might be in better jobs, and have higher job satisfactions. Conversely, they might in general feel that their education was under-utilized and their contributions unrewarded. In either case, education would be correlated, positively or negatively, with satisfaction.

The results show that education is not a key factor. Some variables changed significantly with education, some increasing, some decreasing, and some changing irregularly. However, no change was large enough and consistent enough to account even in a small way for the big general difference in morale. (For those readers who are interested in details, a few outcome variables changed significantly with increased education). Satisfaction with Pay increased rather regularly. Job in General decreased steadily except for those with graduate degrees, who were at a somewhat higher level of satisfaction. Intent to Quit increased (indicating less satisfaction) as education increased, but then decreased for those with graduate degrees. These changes correspond to the decrease and increase in JIG. Some Input variables varied with education. Perceived Autonomy actually is slightly less for persons with more education. Task identity varied significantly but the difference was due to a lower average for the two-year college group. Goal clarity also decreased substantially with education. Other differences in educational groups were related to changes in the situation at Watts Bar and will be discussed later). Appendix C shows means and standard deviations for scores according to this breakdown (and subsequent analysis).

b. Unit. Satisfaction or dissatisfaction could well be concentrated in certain units or schedules. Many persons, apparently fearing loss of anonymity, did not report unit or

schedule. Examination of those questionnaires (the majority) which reported unit shows some differences between units in terms of satisfactions and dissatisfactions. Only a few of these are even part of the first or overall morale cluster we have been considering, but they are nonetheless interesting: Identification with TVA, Trust in Management, and Intention to Quit show large and consistent differences among units in morale. The differences between the units involving the variables from the Supervisory Communication group are especially important here. Larger differences among units appeared on Satisfaction with Supervision, as well as on all of the other variables mentioned under Supervisory Communication. The biggest and most consistent differences occur for Satisfaction with Supervision, Feedback (General and Goal-setting), Communication, but also for Acceptance of Job Changes, Recognition, and for the other variables to a lesser extent.

We do not wish to violate anonymity by indicating in this report the particular units showing especially high or low averages. It is sufficient to say, yes, a major source of differences in both the overall morale factor and the supervisory communication factor is associated with the unit in which employees work. These means are not included in Appendix C.

Answers to open-ended questions also highlighted some problems with particular units. These seem indeed to require confidentiality.

c. Schedule. As was the case for analysis by unit, we lost a number of cases because the people did not identify their schedules, apparently because they feared loss of anonymity. For the people who reported schedule, we can draw some conclusions. However, we will do so without pin-pointing the particular schedules with low morale.

First, as an overall statement, there are large and significant differences among schedules for all variables except for two Outcome variables, Satisfaction with Co-workers and with Life in General. Examination of the averages according to schedule indicates that for all variables, except the Input variables of Autonomy and Task Identity, it is the Managers who have the most favorable scores. The gap between their average and that of the other schedules is large for most variables. Managers were also twice as likely as Non-Managers to have received BONEs. 70% of Managers and only 35% of Non-Managers reported having received one or more BONEs per month.

Could it be the 49 (out of 70) managers with BONEs who are primarily causing the high overall correlations? In other words, could they be responsible for the Morale factor? No! The managers constitute only 7% of the total sample, and hence could not have caused the high correlations between variables.

d. Tenure. The length of time the employee has worked at WBNP could, like education, have worked either positively or negatively, and could have been responsible for a major part of the differences in Morale or Supervisory Communication.

First, test scores were compared for persons with less than 1, 1-3, 4-7, and 8 and over years' tenure at WBNP. There were very few significant differences, and none even nearly large enough to account for a significant portion of either the General Morale factor or the Supervisory Communication cluster. There are, moreover, no significant differences among tenure groups in Trust in Management or Job in General. Neither is there any significant relationship with Satisfaction with Supervision, Feedback, Communication, or other variables in that cluster. These means are given in Appendix C.

There is a tendency for a U-shaped relationship between tenure and some variables, so that both the shortest- and the longest-tenured groups are more identified with TVA, less likely to quit, and more satisfied with their co-workers. They also show higher trust in their fellow employees. People seem to start out with moderately high satisfaction, become disillusioned, and then either quit or improve their feelings (although still not as high as the national average).

2. Transfers. Employees who had transferred to WBNP from other TVA plants could be separated as a group from other employees by the difference in the answers to the questions about tenure at WBNP and tenure at TVA (Questions 27 and 28 on the second answer sheet.) Transfers were of particular interest because a number of employees mentioned that there were many managers transferred in as other nuclear sites were closed down. These transfers were interpreted by respondents to the open-ended questions as another piece of evidence of the buddy system--finding jobs at WBNP for friends of management displaced from other plants. (Employees did not seem to realize that many transfers were introduced in an attempt to clarify lines of responsibility.) At any rate the transfers did not differ significantly from other employees, except for slightly higher average scores on Job in General and Identification with TVA. (See Appendix C.)

The inclusion of the transfers in the sample is not responsible for the obtained differences among employees. This does not mean that the presence of transfers may not have affected other employees.

3. Pay and Promotions. A frequent source of open-ended comments is pay, promotions, and inequities in these (see Table 1). The wage freeze ("red circle") was already in effect at the time of the first pretest. Complaints continue, and seem qualitatively stronger.

A few examples are:

> Pay is terribly discouraging.
>
> I am enjoying supervising this unit; however, it is sometimes embarrassing being the lowest paid man in it...
>
> The biggest problem that I have with TVA is the misuse of its technical people. TVA has some of the best engineers that I have met but rather than using this pool of technical knowledge the engineers are turned into paper shufflers with very little to stimulate their professional curiosity or the desire to learn more.
>
> Second on my list of gripes is the promotion policy. Frequent promotions up to a point based on worker ability tends to improve morale. TVA's basic system of schedules and grades tends to discriminate on the basis of time of service rather than on ability.

For reasons of anonymity, we did not obtain figures for actual pay or for promotions. Actual pay and promotion would operate, however, by changing satisfactions with Pay and Promotions, and we can examine the impact of these variables.

There has been, as noted above, a significant drop in average Pay and Promotions Satisfactions (see Figure 2). We examined the data to see what variables changed with these scores. It looks as if those dissatisfied with Pay, Promotions, and the operation of the merit system in general are a sub-group of the dissatisfied. The satisfied also group these variables together, so that we have a third cluster in addition to the Morale and the Supervisory Communication factors.

How much does this cluster affect the other groups of variables? Is it responsible for the obtained relationships? We can get an estimate of the upper limit of the effect of the Pay-Promotions-Recognition cluster on overall satisfaction by the highest correlation any of the variables shows with any of the overall measures. It is somewhat strong by this estimate, since Promotions shows a 17% overlap with Job in General and Trust in Management. It also overlaps with Supervision and Feedback. Undoubtedly it is an important area of dissatisfaction. The correlations are not, however, high enough to be even considered as the principal source of high versus low morale or high versus low supervisory communication. Its relationship with other changes at WBNP will, however, be discussed below.

In the open-ended responses, complaints about Pay and Promotions are bitter. Besides lack of promotional opportunities, employees report failure to promote on merit and failure to upgrade jobs. Red-circled increases in pay in face of

inflation received strong comments, as do differences in pay schedules between new and longer-tenured employees and between higher and lower organizational levels.

4. Changes in Situation at WBNP. Individual characteristics, Transfers, or Pay and Promotions could not have accounted alone for either the average decline in morale or the large individual differences in Morale and Supervisory Communication. Therefore, we proceeded to check the effects of the principal changes that have taken place at WBNP.

a. Orientation Program. The first (Pretest) Survey had indicated dissatisfaction with orientation for new employees. Therefore, a revised orientation program has been introduced at WBNP. This program could have had a major impact on those new employees who had participated. Question 45 (p. 10) asked about the usefulness of the program. Responses spread rather evenly from "Very useful" to "Total waste of time," with the median falling between "Questionable" and "Somewhat useful." The average response was thus slightly unfavorable.

We treated this item as a small scale, which we correlated with Outcome and Input variables for those who had been exposed to the program.

First of all, reaction to this program is slightly but significantly, related to reactions on other scales, particularly the Outcome variables: Trust in Management, Intent to Quit, Job in General, and Work Satisfaction, and others to a lesser extent. A few Input variables showed small significant relationships: Job Definition, Recognition, Communication of Work Changes, Goal-setting Feedback, and Goal Clarity. The program has obviously had a favorable impact at least on some persons, whose satisfaction and perceptions are more favorable.

The obtained correlations, even when significant, are small. (The largest could account for only 14% of variations. Only about 135 or 19% of the employees reported that they were exposed to the program and had less than a year's tenure. At the most, only .19 x .14 or 2.6% of the variance would be involved. The effect of the orientation program could contribute slightly to higher satisfaction on some scales, but cannot be the principal source of either factor because: (a) the relationships are too low, and (b) the relationships even when significant do not show the same pattern or clustering shown in the analyses of all persons combined and (c) not enough people are involved.

Free or open-ended responses were obtained from 44 employees concerning the orientation program. They are summarized in Table 2 of Appendix A. There are no outstanding themes in these responses, which scatter across a variety of topics

b. Good Neighbor Program. As part of the systematic process of checking effects, we next investigated the impact of the Good Neighbor Program. Two scales were formed, one involving attitude toward the good neighbor program (Questions 37 and 43) and one for extent of participation. Unfortunately, it seems clear that only a small percentage of persons were actively involved. About 60% responded that they had not contributed at all to any of the projects and that that contribution was about equal to or less than that of others, or less. It is possible, however, to state some characteristics of the people who have become active in the Good Neighbor Program. They more frequently have graduate degrees, tend to be in the longest tenured group, to be managers, and to have favorable attitudes toward the orientation program.

Correlations show that extent of participation is simply not related even moderately highly to either the Outcome or Input Variables. The largest relationship (with Recognition) accounted for only 4% of the variance, and the bulk of the other relationships did not even reach minimally acceptable significance.

This program was very well received, however, by both participants and non-participants. Attitude toward the Good Neighbor program is only slightly, even though significantly, related to overall morale (see, for example, the second pair of bar graphs in Figures 5 and 7). (These pairs of vertical bars illustrate what we mean by a small but significant correlation.) The Attitude toward the Good Neighbor program cannot possibly account for either group of Morale or Supervisory Communication variables, but it may contribute slightly to them. (For example, 4% of the variance in Intent to Quit is related to Attitude toward Good Neighbor Policy. It is not likely that the Good Neighbor Policy directly cause the higher morale of many persons, but the relationship was probably the result of the spreading of general positive or negative morale to the attitude toward this policy as well as to other attitudes.)

c. Communications Committee. A committee to air employee viewpoints and suggestions and generally to improve communications was given renewed emphasis. The impact of this committee was assessed by forming a scale simply adding the scores for Questions 49-51 and 53 (p. 10 of Post-test 2 survey) (Q. 52 proved not to discriminate and was not included). Twenty-six percent of the respondents had the lowest possible score on this scale. The mean also indicates only slight knowledge about the committee.

It is not surprising, therefore, that knowledge of the Communication Committee is not highly correlated with the Outcome and Input scores. The largest correlation (with Trust in Management) again accounted for less than 4% of the

variance. The correlation with Intent to Quit was even lower, though significant, accounting for less than 1% of the differences among individuals.

The kinds of persons who have become interested in the Communications Committee can be identified. They are very clearly the persons with longest tenure at WBNP, and they are not generally transfers. They are likely to have graduate degrees, but for the most part are not managers.

The impact of the Communications Committee has not as yet been very large. It could not now be considered a principal source of variability in morale.

d. Approach of plant to completion. The nature of tasks changes as the type of construction changes. Moreover, job security alters for this reason, as well as because of economic conditions.

The effects of these variables cannot be measured directly. But there is evidence about two aspects. Pay satisfaction, as discussed above, is not a primary cause of overall satisfaction or dissatisfaction, but operates more or less in isolation. The nature of tasks has changed, however, as evidenced by significant changes in several Input variables. Perceived Task Variety increased and Autonomy decreased. These variables are both significantly related to both overall morale variables and supervisory communication. But since one improved and the other deteriorated, they cannot have caused the changes. (The correlations, moreover, are not high.)

e. Clarity of supervisory responsibility. For Post-test 1, a major source of improved satisfaction with Supervision and improved Communication was the clarification of lines of authority and responsibility. This claricatio was necessitated when WBNP found that there were, at certain middle levels, no persons in authority who could observe actual on-the-job behavior sufficiently well to be able to write BONEs. For one index based on knowledge of who the supervisor was, there were no significant changes from Pretest or relationships with Outcomes or Input variables. But there was significant improvement from the Pretest as indicated by the retrospective pair of questions, "Three months ago, were you unsure about the responsibilities of your immediate supervisor?" and "Now, are you unsure about the responsibilities of your immediate supervisor?" In the present survey, these were reworded to refer to "last July" and "now." Did employees perceive continued improvement? Actually they report about as much improvement as they did in the Progress report. Twentyeight percent overall, however, still report that they are unsure about the responsibilities of their supervisors.

This measure was part of the General Morale Cluster, but it did not correlate highly enough with any of the central measures (such as Trust in Management or Intention to Quit) to be considered a major cause. The same applies to the variables that go together in the supervisory Communication cluster. They are much more highly related to each other than to Clarification of Supervisory Responsibilities.

The persons whose jobs showed the greatest improvement on this variable were the Managers, and two other schedules. There were also differences by unit. The small number of cases means that anonymity might be broken if these schedules and units were identified. It does not seem worthwhile to partial out the effects of this variable for this sample.

APPENDIX C

TABLE 3

Comparison of Means for Those Employees Whose Supervisors Issued BONEs and Employees not Receiving BONEs

	Pretest	Post-Test 1			Post-Test 2		
	All	All	BONES	No BONES	All	BONES	No BONEs
Outcome Vbls							
JDI:							
Work	25.6	26.1	25.2	26.5	24.2	24.7	23.2
Pay	20.6	20.4	21.2	19.9	17.9	18.7	16.2
Promo	13.7	13.3	13.9	12.9	11.5	12.6	9.3
Super	32.0	34.7	35.6	34.2	32.8	34.7	29.0
Coworker	32.7	35.2	34.2	35.8	34.3	35.1	32.8
Job-In-Gen	30.4	31.3	31.5	31.0	27.0	28.3	24.5
Accept Job Change	8.7	8.7	9.1	8.5	8.2	8.4	7.9
Ident with TVA	5.0	5.1	5.2	5.1	5.0	5.1	4.7
Intent to Quit (a)	8.7	8.2	8.2	8.2	9.0	8.9	9.1
Trust in Management	15.2	15.9	15.9	15.9	15.4	15.9	14.4
Trust in Employees	21.3	21.8	21.9	21.8	21.6	21.7	21.3
Input							
JCI:							
Variety	13.3	16.6	16.5	16.7	20.4	20.4	20.4
Autonomy	21.4	21.0	21.0	21.0	17.3	17.2	17.6
Feedback	13.1	14.1	14.7	13.8	16.7	17.3	15.5
Task Ident	14.5	14.6	14.6	14.6	14.0	14.0	14.2
GSA:							
Goal Clarity	13.0	13.7	13.7	13.7	13.0	13.6	11.9
Goal-setting Feedback	9.0	9.6	9.7	9.6	9.1	9.4	8.6
Participation In Goal-setting	5.3	5.6	5.9	5.5	5.2	5.5	4.8
WBNP Scales:							
Job Definition	10.7	10.8	11.0	10.8	12.2	12.5	11.6
Recognition of Performance(a)(b)	11.7	11.2	11.2	11.2	11.4	11.0	12.0
Communication(a)(b)	6.0	5.7	5.6	5.9	6.0	5.9	6.3
Clarity of Supervision		5.6	5.7	5.5	5.5	5.6	5.4
Clarity of Super Responsibility		5.3	5.4	5.1	5.2	5.3	5.1

a. Scored in reverse; high score means low satisfaction

b. Scores not converted to common scale as in Figures (Conversion by multiplying constant.).

TABLE 4

Comparison of Means for Transferred and Non-transferred Employees

	Transfers	Non-Transfers
Outcome Vbls		
JDI:		
Work	25.4	23.8
Pay	19.2	17.3
Promo	12.8	10.9
Supervision	33.8	32.7
Coworker	34.4	34.2
Job-in-General	28.7	26.5
Acceptance of Job Changes	8.5	8.1
Identification With TVA	5.4	4.9
Intent to Quit (a)	8.5	9.1
Trust in Management	16.3	15.2
Trust on Employees	21.8	21.5
Input		
JCI:		
Variety	20.8	20.4
Autonomy	17.4	17.3
Feedback	16.8	16.7
Task Identity	14.4	14.0
GSA:		
Goal Clarity	13.4	12.9
Participation in Goal-setting	5.4	5.2
Goal-setting Feedback	9.5	9.0
WBNP Scales:		
Job Definition	12.6	12.1
Recognition of Performance(a)(b)	11.5	11.3
Communication(a)(b)	5.9	6.1
Clarity of Supervision	5.5	5.6
Clarity of Super's Respons.	5.1	5.2

a. Scored in reverse; high score means low satisfaction.
b. Scores not converted to common scale as in figures (Conversion by multiplying by constant.).
Transfers have been at TVA more than one year and at WBNP less than one year.