

REFINERY WORKERS LEARN THROUGH TEAMWORK

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*"It isn't my fault. "
 "Nobody told me about it."
 "The morning shift is responsible for that."
 "Management doesn't listen." "There was not enough time."*

Do these statements sound familiar? If they do, then your employees might be caught up in what experts call an "avoidance culture". And it can hit your bottom line, as workers try to cover up mistakes, not attract attention, and please their boss, instead of focusing their efforts on greater achievements.

The beliefs, attitudes, and expectations that make up the "culture" of an organization also determine its reliability and safety performance.

Management at the second-largest oil refinery in North America asked The Reliability Group, a Miami, Florida based consulting organization, to assist them with their goals of significantly reducing accidents and injuries, as well as eliminating premature equipment failures, unscheduled outages, and environmental "spills."

As a first step, The Reliability Group conducted the Human Systems Reliability Survey. As a result of their research, the consultants have documented significant relationships between the attitude & thinking styles of employees, job characteristics, and accidents. For instance, it has been shown that supervisors who are more facilitative place a greater emphasis on safety and consequently have safer operations than supervisors who tend to be autocratic. Also, several job-design factors have been shown to be directly related to a safe work place, such as allowing employees to:

- control the speed of work
- decide when to take breaks
- decide how to do a job
- determine who they work with.

In addition, having a challenging job with clearly defined responsibilities is a significant determinant of a safe work place. Employees who answered positively to the following questions had sig-

nificantly less accidents than those who were less positive:

- "I am given a chance to do the things I do best"
- "My job lets me use my skills & abilities"
- "I have an opportunity to develop my own special abilities"
- "I know exactly what is expected of me"

"My responsibilities are clearly defined"

"On my job, there are procedures for handling everything that comes up"

The Survey consists of 120 questions covering organizational systems and procedures, work group factors, and specific job variables (Figure One).

Figure 1: Factors Considered in the Human Systems Reliability Survey

Organizational Level

- commitment to safety
- vertical communication
- inter-unit coordination
- performance appraisal
- training & development
- employee selection
- management interaction
- safety training
- goal emphasis
- task facilitation
- interaction facilitation
- supportiveness
- safety emphasis
- organizational culture

Work Group Level

- authority/autonomy
- workflow stability
- performance feedback
- safety emphasis
- cooperation & teamwork
- intra-unit coordination
- cross-job knowledge
- emergency capabilities
- awareness & perspective

Job Level

- task skill variety
- autonomy
- feedback from job
- task identity
- role clarity
- role consistency
- work load
- effort required
- challenge
- involvement
- satisfaction

Work Place

- physical environment
- ambient conditions
- degree of organization
- stress factors
- equipment quality
- equipment maintenance
- materials & supplies
- work procedures

Safety

- reaction to accidents
- rewards/incentives
- accidents/near misses
- accident/near miss reporting

The "Organizational Culture Inventory", was also used by the consultants. It identifies the dominant styles or "cultures" that exist in an organization. The surveys were given to a cross-section of the refinery operations group, including managers, supervisors, operators, and maintenance personnel. In addition to the two surveys, the project included plant observations and personal interviews.

Responses to the Survey were generally positive, indicating management's commitment to a safe and reliable work place. Safety training was evaluated favorably by all groups. Employees reported that accidents were investigated more thoroughly than equipment failures, indicating their belief that management was not as committed to reliability as it was to safety. Employees also expected someone to be blamed as a result of an accident or premature equipment failure.

Although job satisfaction was high, management and supervisory groups were more positive about their jobs than employee groups. Employees reported that they are not sure what management expects from them, and that vertical communication needed improvement.

To address the recommendations provided by the consultants, refinery management created a task force made up of managers, supervisors, and hourly employees. The task force members asked the consultants to develop a training program that would address the specific improvement areas documented in the surveys.

The consultants developed a series of team-oriented training exercises that involve participants in problem-solving situations such as, "How do you reduce pump failures? How do you improve operating reliability?" The exercises allow employees to discover for themselves the most effective ways to:

- Conduct failure inquiries
- Develop strong operating teams
- and reduce "blaming" between functional groups
- Investigate the perceived trade-off between preventive maintenance and production
- Enhance team communication and the upward flow of information

- Increase the feeling of employee "ownership" of equipment.

The exercises use the method of "context shifts". Employees are placed in a leadership role and asked to solve a problem such as a high pump failure rate from their bosses perspective. The employees complete a three-step process:

1.) First, they individually decide what steps to take in the situation.

2.) Second, teams are formed and a consensus process is used to determine the most effective way to solve the problem.

3.) Third, participants compare both their individual and team answers to an expert opinion and score their results.

This basic process of individual thinking, team decision making, and high-quality feedback increases both individual learning and team work. The exercises are completed in monthly meetings involving maintenance, operating, and engineering personnel.

The approach works because several fundamental factors that control human perception are built into the program. When a group accepts a goal, the accumulation of knowledge and energy will be greater than the sum of individual efforts. Experience has shown that 85% of the time, the team score is superior to the average individual scores. Through this process, people see each others' viewpoint, discuss ideas, and actively participate in the problem-solving process.

Workers trained in this manner approach a problem logically as a team to combine their best efforts in the problem-solving process, which precludes shifting responsibilities or blaming others. They don't remain passive and uninvolved when the group recognizes that a problem exists, nor do they blindly follow a self-pronounced leader.

This team approach has prevented many accidents and saved numerous lives. One large chemical company experienced a catastrophe that caused many injuries. The only division that had no injuries was the one that had team training. Companies have also reported

productivity gains by using the team training approach.

By using the Survey and exercises, the client was able to focus on specific opportunities to increase the operating reliability at their refinery. From the development of shared attitudes and beliefs, the employees are creating a culture that is based on the dual objectives of safety and operating reliability. Peer members correct each other's unsafe acts, as well as work across functional boundaries as a team. A refinery manager remarked: "There is nothing like peer pressure to get people on the bandwagon. It's a lot more effective than someone paying lip service to training."

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