

FACTORS OF GROUP WORK CULTURE WHICH INFLUENCE THE SAFETY OF POWER LINE MAINTAINERS

**Ben Barkow, Ph.D
Behavioural Team
Toronto
1992**

EXECUTIVE SUMMARY

This report is part of a five part safety initiative undertaken under the direction of Alan Lee. It investigates problems of safety through a consideration of the strengths and obstacles of group work culture among Power Line Maintainers.

The group culture and perceptions of Power Line Maintainers (PLM's) are described in the report. Overall, this trade shows adaptation to their work, effective job and social integration, and high morale. Attitudes towards safety, while reflecting confidence in personal skills for avoiding injuries are not favourable about improving the situation through safety activities.

Supervision at the UTS (and to a lesser degree at the TMS level) was identified as an issue needing attention because of its immediate impact on safety. Also identified as issues were forces on the job which might act to compromise safety, social relations within work groups, and the need for refresher training at all levels.

Recommendations are as follows.

For early implementation...

- **address the issue of safety beliefs and encourage a less fatalistic outlook,**
- **improve attitudes towards UTS level resulting in greater appreciation for the job and the person in the job,**
- **develop a “lifeskills” module for the TUTS training program which would better prepare tradespersons for some of the social realities of that role,**
- **create refresher courses to ensure that all PLM’s are current in their skills and to provide needed updating information to UTS and TMS staff, and**
- **increase attention to threats to safety from productivity, customer satisfaction, and personal motivation pressures.**

For phased implementation...

- **re-examine crew formation to promote more effective “brother’s keeper” behaviour,**
- **enlarge sense of ownership of work gear, and**
- **review the job of the TMS in order to make the job a more appealing goal for PLM’s and to increase the contact which TMS’s have with field staff.**

Recommended for further study...

- **efforts at job enrichment including rotation around the corporation and improving communications at the PLM level and**
- **general examination of career paths within Ontario Hydro.**

BACKGROUND AND TERMS OF REFERENCE

1. The safety paradox of power line maintenance

An Ontario Hydro retail Power Line Maintainer (abbreviated as “PLM” in this report) is statistically likely to retire or leave the trade alive and with all limbs intact. To a new observer, this is an achievement because PLM’s:

- work with life-threatening voltages and currents,
- work at heights from which a fall would result in serious injury,
- manipulate power tools, often while working at heights,
- conduct most of their work on public roads and reach these sites by driving some distance each day, and
- must maintain standards of safety despite the demands of heavy outdoor work, working extra hours during emergencies, and all the while balancing the demands of productivity, service to customers, and allegiance to co-workers.

There is a human paradox here. The people who do this work are hired because they have a *willingness to undertake a trade* which includes these hazards and yet they must *conduct themselves* with probity and safety.

2. Background and *Terms of Reference* of the project

In February, 1992, an initiative was begun by Regions Branch to review the “management of work in electrical environments... so that all such work can be completed in a safe and cost effective manner” but limited to the distribution network under 50KV. A steering committee was formed under the leadership of Alan Lee, Branch Safety and Environment Manager. Five Areas were identified for further development under separate sub-committees.

The five Areas dealt with current procedures at Ontario Hydro, procedures used elsewhere, risk analysis, impacts on customers, and the current report which deals with “the analysis of Line trade culture and its impact on current and recommended methods of managing work in electrical environments.”

There are roughly 1700 Power Line Maintainers headquartered in Areas and smaller sub-centres. They work out of doors installing, maintaining, and upgrading lines, and restoring service after an outage. Occasionally their work includes distribution systems above 50KV. Separate from the Line trade are the Foresters who maintain the lines free of natural growth.

In recognition of existing and increased responsibilities and corresponding increases in trained skills, the PLM’s have recently been re-designated as

conferences, at lunches and coffee breaks, work with 44KV lines, helicopter assisted work, and work reached by boat.

Interviews with supervisors and regional and Area management

Individually and in groups, interviews were conducted with supervisors ranging from temporary UTS's through to Regional Lines supervisors and Regional Retail managers.

Interviews with executives and specialist staff

Individually and in groups, interviews were conducted with specialists who are in safety, training, and human resources. In addition, three senior executives were interviewed, Hal Wright, Vice-President, Regions, Don McKinnon of CUPE Local 1000, Ontario Hydro Employees, and Ron Stewart formerly with the Regions Branch.

Written information

Other written information was reviewed including accident reports, training evaluation, the *Line Trade Handbook*, safety materials from various regions, job planning materials, occupational safety studies, etc.

Areas contacted

The contractor collected information at the following locations:

- Bancroft and Kingston Areas,
 - Belleville Traveling Line crew at Cobourg, Havelock, and Peterborough,
- and
- the Belleville Regional office
 - Beachville and Essex Areas,
 - Kenora Area and the Thunder Bay Regional office, and
 - Newmarket and Owen Sound Areas.

2. Reporting

The purposes of this report are (1) to indicate the characteristics of the trade which are felt to be of importance in understanding safety and (2) to offer prioritized recommendations for improving the situation.

This report does not examine details of the work at length because it is assumed that the reader already knows something about the work of the PLM.

4. Group culture and sustaining safety performance

High safety performance is a fragile statistic. Organizations sometimes show fluctuations in their safety record. This indicates that the goal of a low accident rate requires ongoing vigilance against insidious changes and constant renewal of effort.

To the Behavioural Psychologist, "learning" and maintaining safety behaviour is an unusual task. Ordinarily, learning requires practice with right behaviour and reward for achievement as well as, occasionally, some contact with wrong behaviour and noting the consequences of the wrong behaviour. This helps the person discriminate between right and wrong and reinforces their motivation. But wrong safety-related behaviour in the Line trade can lead to a severe injury. Therefore, the setting for the learning of safety is not a typical learning situation. As a consequence, it is no simple matter to train and to maintain safety behaviours.

Because the group culture of a corporation or of a trade within a corporation can endure through much longer cycles than any practical safety campaign or even longer than any individual safety manager, strengthening the safety-enhancing elements of a group culture can have effects which endure. These elements go beyond specific reactions to safety belts or grab-all poles. These elements can include receptivity to a safety outlook, positive interest in training, and favourable attitudes towards change.

Group norms may have great endurance. For example, it means that new staff may find themselves under pressure to conform and thus to continue the old traditions. This state of affairs among PLM's has been commented on several times in the course of this project, both in favourable and unfavourable ways.

Therefore, it makes sense to understand and to influence the safety culture of the PLM's because enduring benefits may arise from this course of action.

CULTURE OF THE WORK SETTING

1. Beliefs, Values, and Perceptions Related to Safety

PLM's hold a variety of beliefs, values, and perceptions with respect to their safety. The materials from the discussion groups and other sources have several common themes which are detailed below. However, it is important to remember that while themes emerge, there is generally a fair amount of diversity of opinion among individuals. Some main attitudes held by PLM's are as follows.

1. The PLM has a fairly safe job.

PLM's do not see themselves as risking injury in the conduct of their job duties. In most Areas, PLM discussion participants felt that their job was not materially more hazardous relative to other non-office jobs despite their daily risk exposure. There was a perception that there was little reason to worry about having an accident.

2. Many accidents result from momentary ill-considered acts which get the person into trouble.

During some discussion groups, recent accidents were reviewed to discuss what causes these types of accidents. A common reaction was that the accidents showed evidence of a lapse of judgment on the part of the accident victim.

3. Accidents result from unpredictable causes.

A common theme during discussion of previous accidents was their "freak" nature or unpredictableness. These could be due to environmental factors such as trees falling or unforeseen consequences of a PLM action.

4. Some hazard control measures are more acceptable/important than others.

Risk factors related to perceived inadequacy of equipment were important to PLM's. Discussions of unresolved safety issues tended to revolve around equipment factors such as non-standard controls on bucket trucks or making do with equipment that was less than ideal or in a poor state of repair. Personal safety equipment, training, supervision, and other risk factor classes were rarely mentioned as a source of concern.

5. Safety is a matter of common sense or being careful.

A common view of how to bring about an accident-free working environment was simply being careful or using what was often referred to as "common sense." Reservations were expressed as to the place of "safety

expertise” either in engineering or in safety programs as the road to better safety.

2. Job characteristics

There are not many industrial analogies to the work done by the PLM’s. They are maintainers and builders. They have a body of tools — some very big ones like double bucket trucks — but these tools are not their personal responsibility. The tools for which they have personal control are relatively few. They work away from their plant base “in the field” but are often directly supervised especially when working in multiple-person crews.

Their work is as carefully routinized as it can be, reduced to the smallest number of wrench sizes, techniques, and tools. They are asked to abide by a very detailed *Handbook*, but show little adverse reaction to the many do’s and don’ts in the book. Very often they must improvise, wisely assess the situation, and think through the attack on a job.

3. Physical demands of the work

The work of the PLM is very demanding physically and represents a great source of pride to those who can succeed at this work. The pride carries over, inevitably, to a self-confidence which is a threat to safety because it can diminish caution.

4. The ideal of customer service

A strength of the PLM culture is a commitment to customer service. They have a strong empathy for those who depend on the unbroken supply of electricity whether it be a dairy farmer, hospital, parents of babies, or just old people who can’t figure out how to re-set their VCR clock after an outage.

But within this strength lies a threat to safety. In so far as the PLM’s seek to keep the supply uninterrupted, they are placing themselves in a conflict of interest with safety by working on energized lines.

It has been mentioned that on Friday afternoons, the Foresters are busy maintaining their gear and ensuring that it is in a safe condition. What are the PLM’s doing? They may be rushing to connect one last customer before the weekend.

5. Attitudes to planning

This section describes beliefs, values, and perceptions related to the role of planning and procedures as a safety factor. While planning occurs at many levels, this section deals specifically with smallest, most immediate planning, namely, the “game plan” before PLM’s climb the pole or dig the hole.

1. How much planning is the right amount?

There is a great variation between Areas to the question: “How much emphasis is placed on developing and communicating the game plan to each PLM on the crew: too much, about right, or not enough?” There was the range of opinion across Areas. In one Area, for example, it was felt there was enough planning but it was not communicated sufficiently well to the PLM’s.

2. It is hard to plan for the unpredictable.

A frequent comment was that there is some unpredictability about almost any job. Therefore, any plan would have to be revised to incorporate changes in the situation. This undermines the full value of a planning activity.

3. Paperwork is to provide justification, not improve safety.

A common perception was that writing down a plan provided little safety benefit over simply communicating the plan verbally. The writing activity was seen as something mainly to benefit management, and something which could be used to criticize their performance.

4. Routine jobs don’t need planning.

There is perception that in repetitious jobs, or on teams that have worked closely for a long time, doing the job becomes “automatic;” there is no need for a long consultation. PLM’s get in a pattern and go about their work.

5. The *Handbook* was well received.

The *Handbook* is seen as a useful tool. It is one of the more enthusiastically endorsed aspects of the planning and procedures.

6. The social and organizational context of the work

1. Co-workers as friends

The PLM's work harmoniously together and appear to get together as friends after work too. This high level of cooperation is important in their work. It is critical for safety because of the importance of the "brother's keeper" component.

"I'm my brother's keeper" was an often-heard comment. Of course, this is not an all-or-nothing trait but one which groups exhibit in different amounts. Below is a scale which shows various levels from "minimal brother's keeper" to "super brother's keeper." (For ease of exposition, the term "brother" signifies female workers as well.)

1. warn co-worker if you create a potential hazard
(e.g. warn people below when you drop something "air mail")
2. warn co-worker of a hazard he/she is not aware of
(e.g. warn of approaching traffic if he did not see it)
3. constantly monitor a co-worker to alert them of hazards
(e.g. observe a co-worker to warn if they get too close to electrical contact)
4. evaluate co-workers and offer to assist someone who is having a bad day
5. indicate to a lower status person when they do not have safety equipment or are not following the approved procedure (e.g. a journeyman tells an apprentice they ought to be wearing their safety glasses)
6. indicate to a higher status person when they do not have safety equipment or are not following the approved procedure (e.g. an apprentice tells a journeyman they ought to be wearing their safety glasses)
7. take an assertive role to prevent a person from doing something that is very unsafe (e.g. refuse to complete the task with the person or report the person to a supervisor).

The foregoing ladder suggests that "being my brother's keeper" can mean quite a variety of things. The safety culture in the general population is probably at Level 2 - a person would be viewed as "abnormal" if they did not alert someone else of an impending accident.

It is hard to know exactly what an individual PLM meant by this phrase. However, a few people were asked if they had ever seen any activities in Levels 3 to 7. A couple of people had and they indicated that their "brother" did not regularly respond kindly to a suggestion that they abide by safe practices.

2. Supervision

Whenever three PLM's work together, one must be stepped-up to UTS status and that person must be of demonstrated competence (Bill 208). This puts the stepped-up person in a conflict position because he or she

must then “boss” their peers. As the TUTS course shows, *skills* of supervision can be taught and can be performed professionally. But it requires training and practice to get it right. But what about *attitudes* of supervision?

At the TMS level, employees are becoming removed from the field. The demands of the work are heavy and, in some ways, the TMS level is where pressures from above and pressures from below meet. There seem to be fewer applicants for TMS positions recently as PLM’s and UTS’s choose to remain in the field.

7. Career path of the PLM

The first steps in the career path of a PLM is through becoming a UTS, TMS, and through area line supervision. But PLM’s by and large do not wish to travel this road. Why not?

- **There is a strong liking for remaining a PLM and doing physically demanding and varied outdoor work.**
- **There is an aversion and perhaps lack of aptitude for desk work of any sort.**
- **The tasks of the TMS and higher levels are not attractive to PLM’s.**
- **The natural processes of friendship (based on working together at the same level of responsibility) are drastically impaired by promotion to supervisory level.**
- **There is a psychological gap and sense of difference between unionized PLM’s and management TMS’s and this is reflected in sometimes rude and unkind opinions of managers.**

These reasons may explain a disturbing finding in the otherwise quite favourably evaluated TUTS course. The well-accepted TUTS course has not generated strong follow-up interest among those who have taken the first components. Only one-third of those who have taken the workshop (nearly all of Ontario Hydro’s PLM’s) are completing the program.

This is contrary to a goal of such programs, namely, to help trainees visualize themselves positively in the new role. This may reflect resistance to the notion of the trainee actually becoming a UTS or TMS some day.

Whatever the causes of this resistance, the consequences are bad for safety and bad for the organization as a whole. The UTS’s job is particularly critical for safety and failures of UTS supervision have been featured criticisms in accident reports. For organizational health, it is good to have as many candidates as possible for promotion and to be able to select the best. The system can not work at its best when some of those promoted are

not typical of nor fully acculturated to the role of the PLM and hence may not be seen as sympathetic managers.

When talented employees are promoted to the UTS and TMS levels, the factors listed above work against them. First, they have trouble learning to fill the role. The TUTS training goes a long way to filling this need.

Second, they are themselves ambivalent about the rightness or even the moral goodness of accepting advancement over their peers. They have trouble climbing the "brother's keeper" ladder. They have trouble figuring out how to keep their old friends. They may develop a "swelled head" about their career progress and not know how to gracefully move into the role. In short, they don't have the "lifeskills" to succeed in retaining their old friendships while maintaining their sanity after crossing the boundary towards management.

STRENGTHS AND OBSTACLES RELATING TO SAFETY

1. Group cohesion and morale

The most significant basic strength in the work setting is the high level of group cohesion and morale found in nearly all crews observed. This forms a basis of mutual concern for one another's safety and motivates a "brother's keeper" point of view.

2. Being your brother's keeper

In society in general, and in most workplaces, there is a much stronger pull towards "mind your own business" than to "be your brother's keeper." The extent to which PLM's agree with the "brother's keeper" is a definite strength.

There are some downsides to this however:

1. My brother is *my* keeper.

Someone who acts as his brother's keeper will only be successful if his "brother" responds to this concern. This side of the equation is considerably less strong. In other words, the willingness *to intervene* is a strength but the lack of willingness *to be told what to do* by your "brother" makes this less effective.

2. Being an unsafe worker's keeper.

Being your brother's keeper is part of having a cohesive group. However, the downside of this is when the impact extends to trying to compensate for a worker who has a problem such as alcoholism. In this case, good intentions and group solidarity can shield a worker from getting the help they need.

3. Safety Beliefs

Some of the perceptions, beliefs, and values seen among some of the PLM's can lead to difficulties implementing safety initiatives. These obstacles include:

1. Lack of control or predictability

When people are in situations where they feel they have little control over the environment or events, they have little inclination to try to improve the

situation. Those PLM's who believe accidents result from "freak" unpredictable events will not likely be as motivated to expend much effort to protect themselves from hazards as compared to those who believe that their own efforts matter. Effective safety initiatives require that workers feel their efforts can make a difference.

2. It can't happen to me

The feeling that accidents "cannot happen to me" is a common one in the population in general and is a perception that makes the safety professional's job that much harder. There is a theme heard in discussion groups that relates to this belief. As mentioned earlier, many accidents were seen as the result of an ill-considered act. This belief reinforces the "it can't happen to me" belief, as in the following line of reasoning:

- (1) accidents happen to people when an action is unintelligent,
- (2) I take care to never do things like that, therefore
- (3) I am not likely to have an accident.

In other words, the two beliefs, *it can't happen to me* and *accidents result from lapses of good sense* reinforce each other.

3. Safety as a non-technical activity

The perception that safety results from being careful makes it difficult to implement technical safety initiatives. These initiatives can be viewed as overkill. Worse, they may be going against "common sense" or making workers feel that safety people think they (the PLM's) lack "common sense."

4. Work planning and crew formation

1. Beliefs about value of planning for routine jobs.

If PLM's do not attach much value to a "game plan" before starting to work, they can not be expected to devote much effort to this task. Consequently, work plans may be poor.

2. Beliefs about the value of planning for the unforeseeable.

If PLM's view accidents as resulting from *unforeseeable* events, then *planning* is not likely to be viewed as a worthwhile safety barrier.

Planning also contains a threat to safety in that best productivity and lowest budgets are underlying assumptions. TMS's and UTS's say they do not pass on budget pressures to PLM's. But how can PLM's be unaware of the planned schedule or the limits of the budget?

Planning also matters in *people* and *equipment* allocation. There is some diversity among the Areas in how work crews are formed and how they change in personnel composition over time. There are Areas where crews mix-and-match with each new job, Areas which create crews on a formal basis periodically, and Areas which don't make an effort to re-form crews unless hard pressed by human or job requirements.

The safety logic of forming up crews has a number of sometimes opposing elements. First, crews should be sufficiently familiar with each other's habits as to be able to sense when a member of a crew shows up for work in an accident-prone frame of mind. Second, crews should not be so permanently bound together as to inflame personal dislikes or to lack a sense of reprieve from working with someone you don't much care for. Third, a mix of talents and levels of skills needs to be incorporated into the crew, appropriate to the jobs they do.

5. Training

It is curious to find that some Areas have a constant flow of new PLM's while in others, the whole crew is growing old gracefully together. It has often been commented that the new staff bring the fresh ideas to the crew. While this is natural and good, it is not a trustworthy approach which can really ensure that new methods or safety initiatives are promoted among the Areas.

The lack shows in two ways. First, the basic information may not reach all PLM's. Second, it arrives "second hand" with distortions introduced into the idea as a result of weaknesses of human memory and motivation. Third, it may lack "advocacy:" if only one or two young PLM's arrive into the crew bearing the new information and the reasons for changing old patterns, there may be too little pressure to change group patterns. Advocacy is important when new ideas are being introduced into established work groups.

6. Supervision

Good supervision at the sub-foreman level is often mentioned as a critical bulwark against accidents. Overall, there is high respect for those in the first levels of supervision. But criticism exists that supervisors at TMS and

higher levels do not understand the work being done. For example, there are some very subtle differences among bucket trucks which may not be fully understood by the TMS managers who make purchasing recommendations and who, later, make utilization decisions.

Is management out of touch with current realities of the work? While the limited scope of this contract does not support a definitive opinion on this point, several managers thought they needed refresher training to keep them up to date on current methods.

7. Career and work motivation

Upward, lateral, or even the steady-state career options of a PLM are limited. Even with new assistive tools, they can not remain PLM's for the full length of an industrial career because of the hardness of the work and the toll of aging.

Lateral career movement is becoming more constrained as careers within the office stream become elaborated, to the exclusion of influx from the field stream. There are not many office openings for technicians, estimators, etc.

Upward mobility requires severe changes of several kinds.

- **The character of the work changes drastically at the TMS level.**
- **The circle of friends and daily access to these friends is ordinarily drastically disrupted.**
- **Ontario Hydro is perceived as having a "glass ceiling" through which only those with an engineering degree may pass. Therefore, any movement upwards is limited.**

The nature of the PLM's work calls for people of action who probably are not also comfortable sitting still writing PCB spill reports. The consequence is a strong attachment to remaining at the PLM's level as long as possible. Even after a person has fallen below the level of physical capability ordinarily required of a PLM, the others in the crew will support them by ensuring that the work assigned will be within their abilities.

RECOMMENDATIONS

1. Recommendations for priority action

1. Overcoming Obstacles Created by Safety Beliefs

1. Training can expose harmful beliefs.

Safety training can be provided to help PLM's become more aware of their beliefs related to safety. Trainees could complete a Safety Belief Self Assessment then through exercises and discussion these beliefs could be examined.

2. Safety initiatives can take safety beliefs into account.

When safety initiatives are implemented — whether simple posters or whole system-wide campaigns — they come into contact with the “culture” which includes safety beliefs, previous experience with such initiatives, and so on. It is this “culture” rather than the intrinsic quality of the safety initiative that more significantly governs the response of workers.

The influence on group culture can be seen on matters as simple as the choice of safety sunglasses which must be stylish to the introduction of the Behavioural Accident Prevention.

In implementing safety interventions, the question should be asked, “What aspects of the culture will promote or hinder acceptance of this safety intervention? How can the safety intervention be customized to fit the particular culture of this working group?”

2. Brother's keeper

1. Training as a brother's keeper

Training should emphasize scenarios which make clear that an effective Brother's Keeper is more than just feeling good about you partner – it may mean telling him something he doesn't want to hear. It should also emphasize being a graceful *recipient* of co-worker suggestions.

2. Brothers' Keeper and leadership

Good Brother's Keepers have a lot in common with group supervisors. General supervisory training, such as TUTS, will cover many of the factors needed to speak up when safety is an issue.

3. Improve attitudes towards role of the UTS

Because PLM's are not readily moving upwards into UTS and TMS jobs, these jobs are not being filled and performed as well as they might. Because of their critical importance to *all* aspects of job effectiveness, it seems important to address the problem at an early point in time.

Some approaches to improving attitudes are the following.

- Bring the problem out into the open more. Encourage discussion of views and expression of feelings.
- Conceptualize the "mental space" of the temporary UTS and increase the training value of the experience.

Conceptualizing means having TMS's think-through what are the training goals of the experience of the temporary UTS, both technical and personal. Another aspect is to ensure that all PLM's get a reasonable exposure to working as a sub-foreman. They should be encouraged to try the role even when they may hold a strong preferences to avoid it temporarily or in the long term.

It is important for all PLM's to sample the role of the UTS. Whether they fancy that role or not, they should "walk in the shoes" of the UTS and be appropriately debriefed after the experience by their TMS.

4. Develop "lifeskills" module for TSTS training program

The mirror image of improving attitudes *towards* the UTS's and TMS's, is helping the promoted person do well in the new job. As previously mentioned, the TSTS course does a pretty good job of addressing the technical and supervisory demands of the job. This is shown by the evaluation conducted by Orangeville. But there is a another sphere of skill which might be called "lifeskills" which are presently marginal in the course.

To take one example, it has been often mentioned that elevation to a UTS position means immediate catastrophe to the size of a person's circle of friends. Friendship after hours with co-workers is very important within the PLM culture. But as soon as a person is removed physically or socially from an ongoing, daily, *and equal* relationship, then friendship breaks down. This loss has been poignantly stressed in the group discussions.

What can be done? In short, there are many skills which can be brought to bear and these are trainable much like any other skills. The YMCA has

been teaching various lifeskills for about 10 years and behavioural psychologists have developed validated programs for the Canadian Forces of demonstrated effectiveness.

Specifically, Modules 4 and 5 of the TUTS course could carry these training objectives.

5. Expand refresher training

1. ... at PLM and UTS levels

The ineffectiveness of training diffusion being based on the physical movement of young trainees into existing older work groups has been mentioned. The remedy is to place increased emphasis on On-The-Job training and refresher courses for PLM's.

While difficult to document precisely, the exposure of older PLM's to training on new gear and techniques seems not sufficiently comprehensive and controlled at the present time.

2. ... at TMS and higher levels

TMS's and Area Line Supervisors make important decisions which impact on safety. Therefore, they need to have a good understanding of the work and the tools of the PLM's. The respect of the staff is very important in maintaining esprit-de-corps and workplace discipline. Also, the standards of performance set by management can be a very direct threat to safety. In addition, rules and corporate attitudes about live line work flow from management. The authorization, encouragement, or discouragement of live line work bears directly on safety.

To remedy the situation, management needs greater acquaintance with the work. This can be accomplished by more first-hand contact, discussed below. This can also be done by the development of refresher courses. Perhaps some means of computer tracking of "what is new since the last time we had Mr. Brown down for training" could be programmed. Such refresher courses might be useful right from TMS up to the top.

It is not necessary to train managers to use new equipment with any skill but something more than a "trade appreciation" program is in order. It is important for them to understand new techniques by trying them out for themselves. The length of time needed for the

refresher course need not be more than a day or two and can be done in groups.

Previously, the need to conceptualize the “mental space” of the stepped-up UTS was introduced. This job falls to the TMS, of course. The TMS needs to take a greater interest in the learning impact on the UTS.

The TMS is, to use the over-worked term, a “mentor” of the UTS and must not forgo this responsibility. Even so simple a gesture as asking, “Did you find it strange bossing your old buddies today?” can be an entry for a short but useful discussion.

6. Assess influence of threats to safety

1. Productivity, budgets, and planning

The impact of pressures for productivity on safety can be reduced in a number of ways. First, simply being aware of the threat leads to some limitation of the impact of the threat. Second, if management learn more of the PLM’s work through (1) refresher courses and through (2) increased field contact, they become able to estimate jobs more accurately.

2. Customer satisfaction

Keeping the power on (or restoring it as soon as possible) are important motivations for PLM’s. This motivation is enhanced by their direct contact with customers. Even when no spoken contact is made, PLM’s can see customers around their houses waiting for service to be restored.

Psychologically distancing the PLM from the customer reduces the strength of their motivation for customer satisfaction because they have only a minor person-to-person relationship with the customer. This is a change which is happening naturally across the province. Increasingly, office staff, often aided by automatic telephone equipment, can do the job of notifying customers of power interruptions instead of the PLM. While not as personal and humane, it does the job of bringing news of an interruption to customers. Even if the PLM does learn of the disappointment of customers, then he or she will not be as sensitive to their loss.

3. Personal motivations

The pride which PLM's take in their physical capabilities can be a threat to their safety. As accident reports have indicated, some safety procedures are punishing in terms of productivity and enjoyment of the work.

2. Lower priority recommendations for phased implementation

1. Planning & Procedures

1. Planning value training

PLM's could be shown the value of planning through training. Such training should include the Survivor Game which teaches the importance of getting everyone's input in a "game plan."

2. Training for developing good plans

People are more willing to perform tasks at which they feel competent. It may be the case, that previous plans have not been effective. As a result, PLM's have come to view the whole enterprise of planning as not highly useful. If they can be provided training on developing effective plans, they are more likely to see the benefits of planning even for those "unforeseeable" events.

3. Selection of planning-oriented PLM's

If planning is considered an important safety barrier then this should be fed back to the selection process. There is a wide range of attitudes in the general population towards how much people value planning. Indeed it is likely that the staff in safety functions are much more planning oriented than the general population and may have high expectations about how much planning people are willing to do.

2. Review work organization for

1. ... people working together

Additional thought needs to be given the safety logic of forming crews. From the safety point of view, workers need to be able to judge one another's mood sufficiently well so as to be able to be effective

“brother’s keepers.” This implies that crews should be kept intact for perhaps four months at a stretch.

2. ... “ownership” of equipment

The PLM’s have “ownership” of relatively few tools. They can not predict what truck they will be using each day or what condition that truck will be in. The PLM’s do a good job of looking after their common property. Only a few complaints about inheriting someone else’s garbage or broken gear the morning after were heard.

On the other hand, it may be good for safety to have a sense of ownership of a greater number of tools. Being personally responsible for more tools means that more safety related tools are within the PLM’s mental model of his or her responsibility and daily care.

3. Redesign TMS job

1. Provide training in desk skills

Two safety considerations lead to an interest in improving the TMS’s job. There is, first, a need for greater time for the TMS to get to the field. Second, PLM’s need to see management roles as part of their career at Ontario Hydro. A recurrent theme is the distaste which PLM’s have for desk work. So it is important, if the flow of the best talent upwards is to be encouraged, to find means of reducing this distaste.

To some degree, the Line trades are now benefiting from hard economic times because the educational and other qualifications of applicants is rising. 200-300 people are applying for the job each year. This means that skills for writing and desk work are more in evidence than before.

The first effort may be to provide some training in the types of tasks which TMS’s do. It is much easier to do work which you are trained to do than work which you aren’t trained to do. Moreover, it takes less time to accomplish something when you know what you are doing and feel competent to undertake it.

2. Provide support through staffing and tools

It takes much less time to do something when you delegate it to others. Are the office and support staff doing all they can to help the TMS's? Is it necessary for a person at the TMS level to write out the details of a PCB spill in a report? Could someone else do it?

Are there computer tools which can assist and motivate TMS's in their work? Can forms be simplified? Are pre-formatted letters and reports adequate for certain jobs?

3. Increase integration with field staff

An important goal of TMS job re-design is to permit greater contact of TMS's with their UTS's and PLM's in the field. The isolation of the TMS — and higher levels — was frequently commented on. While “lonely at the top” is a complaint heard in many settings, it impacts on safety here.

TMS's set the tone for the PLM's work. They make decisions which impact on safety. They set productivity and customer service goals. Therefore, they must have a good sense of how their staff are responding and the nature of work as it evolves over time.

Currently, the work of the TMS is defined as the person who *doesn't* do anything useful in the field, unlike the UTS. While this may be a fair enough division of labour, it should not mean that the TMS becomes remote from the daily work.

3. Tentative recommendations requiring further study

1. Job enrichment, rotation, and communications

The movement towards job enrichment was prominent in the 1980's and marched under the banner of “Quality of Work Life.” One aspect of this philosophy held that workers do a better job and work with higher morale if they could deal with larger pieces of the industrial terrain.

As mentioned a number of times before, improvement in the relations of PLM's and UTS's is worthwhile. This can be brought about through job enrichment changes which include rotation into desk work, customer servicing, some time in the billing department, even time working with the foresters.

One routine component of job enrichment, and one which dovetails with the current Ontario Hydro emphasis on TQL, is participatory planning and decision making. While decisions as to procedures on a specific job

site are often made collectively, it may be worthwhile to extend this participation. To do so requires both organizational commitment but also training of UTS's and TMS's in the skills required to manage greater participation.

It would be wrong to impose long periods of service in roles outside the PLM's sphere. But a small amount of non-PLM job experience would go a long way towards enlightening PLM's as to the important work done *by others* within the organization and to putting their own role into proper perspective. Finally, it might encourage more PLM's to view Ontario Hydro in terms of a career path.

Some benefits of job enrichment would be:

- greater understanding of management and particularly the supervisory outlook of UTS's and TMS's,
- improved work performance through understanding the related pressures and goals of the corporation, and
- improved safety arising from understanding the threats to safety and through better morale and acceptance of corporate goals.

2. Examine career paths for PLM's within Ontario Hydro

Some organizations make an effort to form their upper management from those who started at the bottom. The Ontario Ministry of Transportation, for example, has had Deputy Ministers who started in the job of a "ball man," the very junior person who holds the surveyor's rod.

Ontario Hydro operates in a world of engineering demand and its upper echelons, staff feel, reflect an engineering priority. Whether largely true or not, this perception of a barrier to the corporate advancement of PLM's hinders the upward flow of talented people by limiting their aspirations.

It would therefore seem advisable to re-think the career options of PLM's. This includes the life-cycle within the trade, the opportunities for re-training and otherwise entering lateral jobs, and, for the talented and ambitious, support and opportunity for rising to the top.