

The Mass Transit Railway Corporation Ltd. (MTR) is one of Hong Kong's major transport operators. MTR's six railway lines serve 2.4 million passengers daily. MTR is implementing BST's behavior-based safety technology in its Lantau Airport Railway (LAR) and its infrastructure maintenance department, involving approximately 1,300 MTR staff and 200 independent contractors. The infrastructure maintenance department is responsible for the maintenance of the power distribution equipment, signaling and telecommunication equipment, permanent way, and civil structures.

Hong Kong's Mass Transit Railway Use

MTR has a long-standing record of excellence in safety performance. In accordance with the organization's commitment to improvement, management has called for continuous improvement in all aspects of safety. To enhance the established safety management system for occupational health and safety, MTR added BST's Behavioral Accident Prevention Process® (BAPP®) technology as a tool alongside existing safety activities.

The role of management and supervision in supporting the BAPP implementation is pivotal. Two years after the first BAPP implementation in LAR, the benefits are accruing. There has been a noticeable increase in safety awareness among staff coupled with a decrease in human factor related accidents over the same period for the areas that implemented BAPP technology. Human factors related injuries have been reduced by 50% in two years.

Overlap Between MTR and the BAPP Approach

There were several strong reasons that MTR was attracted to the BAPP approach to performance improvement. The work environment is a rigorous one in which people are accustomed to following procedures and to being audited and inspected. MTR is a high-performing organization with multi-disciplinary and multilevel improvement teams addressing many different issues. Therefore MTR saw a natural connection to the BAPP approach with its teams of front line staff and firstline supervisors cooperating to resolve safety issues. Furthermore, MTR is a leader for safety performance in the local utility industry and in railways worldwide, and BAPP safety strengthens leadership qualities in participants at all levels of an organization.

Stan Hodson



Infrastructure Maintenance Department (IMD) Steering Team
(Back row l. to r.) CK Pan (INCON®), HC Lee, CK Lee, YM Lam, KW Chan, Jackie Ho, Gilbert Liu, Jacob Kam (infrastructure manager), Barbara Choy (IMD management sponsor), KY Leung (safety & quality manager), YL Yip, MT Wong, TW Li, KM Huen (team leader)
(Front row l. to r.) Bosco Cheng, KH Chan, KW Siu, Amanda Chan, Jenny Chit, Johnny Mok (INCON®), Joey Tse (INCON®)



Lantau Airport Railway (LAR) Steering Team
(Back row l. to r.) Bosco Cheng, CK Pan (INCON®), KH Lam, WK Chow, KC Hung, KY Leung (safety & quality manager), John Kwok (LAR management sponsor), SK Lee, CH Wong, Johnny Mok (INCON®) **(Middle row l. to r.)** Amanda Ng, Adi Lau (LAR operations manager), Adele Chuang, Flexca Chong, Andrew Chien **(Front row l. to r.)** Jenny Chit, Ricky Tang, CF Wong, PM Wong (team leader), KH Wong, Eddy Chan, Martin Cho



es BAPP[®] Safety

In 1998, MTR opened the Lantau Airport Railway (LAR). The start-up phase of such an operation typically poses new challenges for an organization. During the first years of Lantau Airport Railway operation, the personnel working on the line had an occupational injury rate that was higher than the rest of the organization. In 2000, MTR management decided to carry out a pilot implementation of BAPP, adding the behavior-based component to the ongoing safety efforts on the LAR. With the BAPP safety effort assisting other safety procedures, the LAR workforce reduced by half the number of injuries related to human factors.

With that success MTR management gradually extended the BAPP effort to other departments. In 2001, the organization rolled out BAPP in the infrastructure maintenance department. Overall the implementation effort has gone well because education is a high priority in Asian cultures. Employees were willing to be nominated to BAPP steering teams in the expectation that they would learn important skills from the experience.

Developing the Critical Behaviors Inventory[®] Tools

MTR implementation teams analyzed incident reports and developed the CBI[®] tools they would use during observations. The operational definitions include advice statements that clarify related behaviors. The following are some of the advice statements the MTR team produced for its coworkers:

Before going into a tunnel to carry out drilling work, ensure that you have earplugs with you. Wear leather gloves when reloading tickets into the Ticket Issuing Machine, to protect from the sharp edge of the magazine housing. When collecting a coin vault from a Ticket Issuing Machine, use the kinetic lifting technique. When

closing the door of a Ticket Issuing Machine, keep your hands clear of the door edges.

Gathering Data

The MTR team then trained observers to use the CBI[®] definitions to gather data on workgroup performance. David Chu, MTR internal consultant for behavior-based safety and former manager of safety system development, reports that MTR decided to translate the written materials into Chinese text where appropriate. Chu notes that while “the standard of written and spoken English among our operational staff is generally quite high, nowadays Hong Kong today is predominantly a Chinese society.” Thus the spoken Chinese language is considered more appropriate and user friendly, particularly for the frontline staff whose first language is Cantonese.

The translated materials include presentation slides for classroom training, the observation data sheet, and the CBI[®] operational definitions. To preserve the accuracy of the original English language text, in-house professional translators reviewed and approved the translation.

Chu says the data sheet includes specific items relevant to MTR’s operational activities. Those items take into account, for example, tasks requiring coordinated efforts in lifting and loading, electrical safety (power distribution), and night duties such as overnight cleaning. Each BAPP implementation area has developed a comprehensive data sheet listing all the relevant observed behaviors.

Chu points out that the observers have the option of recording their observation comments in Chinese or English. Most of them use Chinese in filling out the data sheets and this has proved to be a big help. In Chinese they can more accurately record both what they have observed and the feedback they gave to the observee concerning how to avoid at-risk behaviors.



Identifying and Addressing Implementation Challenges

The BAPP implementation at MTR posed several challenges at first. Because the BAPP technology was developed in the United States, there was some doubt that it could be simply adopted by a Chinese organization. Because Chinese society is structured differently from Western societies there was concern that frontline employees would not be willing to interact with supervisors and managers in observation and feedback situations. In addition there was some concern that the workforce would resist the observation and feedback process because they would perceive it as involving inappropriate criticism between coworkers.

Resistance to Observation. As of this writing the BAPP technology has been implemented at over 1,450 sites worldwide. During the early phases of implementation at many of those sites, personnel expressed reservations about the BAPP observation and feedback procedure. To address any such concerns at MTR the BST consultant and MTR managers communicated extensively with the workforce about such BAPP principles as *No name, No blame* and *Observing behaviors not people*. In addition the MTR observer training sessions focused on the skills of conducting observations in a non-confrontational manner. As it turned out, the anticipated resistance to observation did not emerge. Instead there was less resistance to observation at MTR as compared with Western organizations.

Social Hierarchy. Chinese society has a very highly developed sense of decorum and hierarchy. This makes it especially difficult for the workforce to engage in activities that may appear to involve criticizing or contradicting their supervisors or managers. To reduce the tension associated with this sense of social hierarchy, the

first steering teams for the various departments included a high proportion of supervisors. Also the first facilitator or coordinator for each team was a supervisor. As each team became more experienced and confident in its BAPP activities, more frontline personnel were added to each team.

Cross-Cultural Effectiveness. Finally, BAPP safety was seen as an import from the USA and there was skepticism about whether it would work in Asia. To overcome this perception the BST consultant provided extensive information to employees about the need everywhere

to *Adapt not Adopt* the BAPP approach. At each site, no matter where it is in the world, an implementation proceeds by adapting BAPP safety to the local culture. As this article has already shown, at MTR those adaptations were numerous — and they are ongoing.

The Benefits To Date

MTR managers note a number of benefits of the BAPP initiative. Operations director **Phil Gaffney** says, “Right down at the front line, people are thinking more about safe working practices and they are pulling together as teams to improve safety. As the executive who writes the corporate safety policy statement and makes public pronouncements about MTR’s commitment to safety, I therefore have much less concern than I used to about whether that safety culture is really there in practice.”

Infrastructure manager, and former safety and quality manager, **Jacob Kam** notes, “I take real satisfaction in the assurance that all my people are working safely. I have a lot of ideas but I don’t know if they will help my guys. More and more I am convinced that the BAPP approach is one of the tools that can really help them.”

John Kwok, station manager and mentor for the Lantau Airport Railway BAPP team, directs a workforce of approximately 500 who include operations and maintenance staff along with independent contractors. All are involved in a wide variety of activities with hazardous elements. Of the BAPP safety effort Kwok says, “I am less tense about safety and health risks because my staff have a new concept of personal care for their own health



and safety. In addition I have a group of observers to help me; I am not relying solely on the efforts of my managers and supervisors.” This improvement has increased productivity among the staff who might otherwise have been injured and among the managers who would have had to investigate accidents. Kwok also sees an effect on junior staff who now, “have an improved perception of management because they see managers demonstrating their concern for employee health & safety, not just for railway system safety and productivity.” Kwok also sees the BAPP activities as a powerful staff development tool, “We started with a supervisor leading our BAPP team and we have now handed that role to a junior grade staff member who showed herself to be an enthusiastic and effective team member.”

Jenny Chit, safety & quality development officer who is providing corporate support for the BAPP team, reports, “I am now getting calls from supervisors and engineers on the BAPP team asking for advice on health & safety matters. This increases understanding of front line issues so I can do my job better. Also I now know who are the right people for me to ask for advice!”

Amanda Chan is a railway protection inspector with MTR’s infrastructure maintenance department (IMD) and a member of the department’s BAPP team. Chan says, “Frontline staff tell me that the BAPP initiative is good for them because it is concerned about their personal safety. Also I get positive response when I am conducting behavioral observations.”

Huen Kai Man, technical officer with the IMD and leader of the department’s BAPP steering team notes that, “The BAPP safety effort brings mutual understanding among representatives of four work sections. This kind of teamwork is what we need to achieve our shared goal of enhanced safety. We had very good response to a recent safety quiz on identified critical behaviors and that is very encouraging. For me, involvement in this kind of safety effort is a kind of job satisfaction.”

Wallace Lo, station operator of Airport Station and former leader of a BAPP team says that, “After participating in BAPP activities I found my safety awareness enhanced and now, wherever I go, I always have BAPP safety behaviors in mind.”

Conclusion

All managers and supervisors have filed their own individual safety pledge in the form of a Safety

Responsibility Statement. The scope of the pledge covers a total of fifteen safety tasks. The statement itemizes actions for individual managers or supervisors in maintaining and advancing operational safety performance. This pledge is well aligned with MTR’s culture, in which safety is a line management responsibility and where safety is one of the key results areas in each manager’s annual appraisal review. This means that managers are obliged to employ management systems that will lead to continuous improvement in safety performance, and managers recognize that BAPP safety is another tool that helps them achieve this key result.

Managers and supervisors have supported the BAPP effort by nominating staff with the right caliber to serve as observers, and also by allocating time for them to undertake observations. Managers demonstrate their direct support through attending all key BAPP functions, or attending steering team meetings and by listening to and giving advice on ways of sustaining the BAPP initiative.

The behavior-based safety initiative has planted the seed for a blame-free safety culture and MTR has begun to harvest the beneficial outcomes.



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— **John Kwok**
Station Manager
Lantau Airport Railway



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