

# BHP COAL AND SAFETY - THE FIRST PRIORITY

Dean Apostolou  
Managing Director  
Australian Health

## EXECUTIVE SUMMARY

BHP Coal and Australian Health began the First Priority project with a vision that workers' health could be enhanced, injuries and deaths could be eliminated if the provision of accurate, early warning information about work environments and standards were to be instantly available, before an incident.

If this "critical intelligence" could be prioritised, communicated, integrated and if responses could be measured and monitored at any time, imagine the benefits to employees and the business.

BHP well recognised that this "critical intelligence" always rested with workers and supervisors, who either perform or manage the work, and know best where the hazards are and can offer practical solutions. However, far too often this intelligence had been underrated, ignored, or overlooked during the hectic daily schedules of line management.

Everyone was aware that burdensome tasks administrative tasks associated with safety management were creating massive paper trails, impacting on performance and were excessively expensive. The gathering of current supporting information, preparing reports, the scheduling of meetings, gaining approvals, assigning work orders to rectify substandard conditions, verifying if and when action had been taken, ensuring those involved are kept informed, had bogged the entire process down.

Inevitably workers stopped reporting hazards, they stopped offering practical solutions, they stopped caring. "Critical intelligence" was no longer being gathered. When injuries occurred and new action proposed, employees rightly questioned the renewed management interest.

It was against this background that the First Priority project was initiated. Much can be said about the creative initiators, the simplification and integration of sophisticated technology, the Research and Development Grant awarded, the innovative interactive communication, the escalation and real time monitoring features of the system and now the staunch shop floor worker support and involvement.

The vision for First Priority has been realised. Now there is a system that has been specifically designed to integrate with your workplaces' existing communication channels and data warehouses, a system that will provide immediate access to

"critical intelligence", all without administrative hassles.

As to the success of this initiative, ask the workers, talk to the managers and review the results.

## INTRODUCTION

Australians consider personal safety, whether at work, a basic right and entitlement. This quote in a business article expanded to conclude that "only those retailers who promise and deliver personal safety to customers, staff members and suppliers will survive, profit and prosper".

Within our country, our workplace and our communities, we have all come to accept the primacy of good health both within and without the working environment as a given.

And as our workplaces become more competitive and the pressures to perform increase exponentially the old systems we used to manage safety have been demonstrated too clearly to be ineffective.

BHP Coal recognised the shortcomings of existing systems to manage safety and embarked on an ambitious project to integrate and streamline all safety related practices in an effort to increase safety performance but minimise the ever increasing administrative burdens.

The First Priority tools not only deliver significant efficiency benefits but also promotes BHP Coal's push to devolve responsibility and accountability to work groups.

## DISCUSSION

The system BHP Coal and Australian Health have jointly developed is called First Priority and this system has, in conjunction with several other initiatives has refocused the significant role employees and their immediate supervisors play in managing ever part of their work, including safety.

As our skills and efficiencies increase, any interruptions, injuries or damage to equipment dramatically affects our employer's profitability, our community and employment future.

Most of us have watched productivity in all areas increase by orders of magnitude as new, more powerful equipment has been implemented. New technology now available has also meant that we can accurately scrutinise and analyse our businesses, our resources, manage our waste, and as a result the decisions we act on now are based on a much more complex model that we could have even considered even 10 years ago.

Improving productivity with new tools and technologies is old hat to BHP Coal's Norwich Park Mine. After all, they were the first site in

Australia to buy two of the world's biggest mobile earth-mover, the Komatsu Super-Dozer, increasing their reclamation rate to the highest in the group, doing away with the more expensive, less flexible drag-lines which had long been used for the purpose.

Likewise, when they assessed the ability of their existing safety systems to help them improve productivity, they identified that they needed to be able to:

- Simplify the huge administrative burden associated with safety management;
- Provide tools that will enable the safety process to be managed prior to adverse outcomes occurring, or in many cases, reoccurring;
- Utilise employee knowledge to manage safety hazards, and automatically share solutions within and without the other sites;
- Devolve safety management to the people doing the job.

First Priority was developed in collaboration with Australian Health, to deliver this functionality and more, all with the objective on improving Norwich Park's safety productivity, but with the infrastructure to support every other site in the BHP Coal Group.

To achieve these objectives, a First Priority Definition Group was established on site with representatives from all sections of the mine. This group, in conjunction with corporate representatives from BHP Coal and BHP Minerals provided the ideas, direction and guidance to develop a system which would be used by and benefit every employee. Consequently First Priority has a number of unique features which include:

1. Providing one integrated system to manage safety communication, compliance and risk management;
2. Delivering immediate updates to all users on current safety activities relevant to their roles and responsibilities, including past performance, interest profiles and risk ratings;
3. Tracking and keeping records of when, who and what action is taken to rectify a reported hazard - recording an audit trail for every action;
4. Prioritising and delivering hazard reports or suggestion for safety improvement to the appropriate person for action;
5. Providing a standardised mechanism to classify and prioritise risks;
6. Escalating tasks or hazard reports to higher management levels (or interested parties) when action has not been taken to rectify unsafe conditions in the time frame allotted;
7. Maintaining a comprehensive, integrated, quality accredited and maintained document

management system (Legislation, Australian Standards, Safe Working Procedures, JSA's, NOSA Standards, Checklists, registers, etc) to promote self reliance;

8. Automatically schedules, organises, manages and escalates recurring inspections, audits and meetings;
9. Monitors and analyses safety performance for a workgroup, department, site, region, state or country an any number of self stipulated performance criteria;
10. Automatically shares - distributes safety solutions, hazard reports with any related person - roles within the organisation; and
11. Recording, distribution, analysis and implementation of remedial action following an incident..

These features ensure that all safety related business decisions can be made with confidence knowing that they are based on the most up-to-date safety policy information, procedures and practices. To achieve these features, First Priority was designed with 6 integrated modules which are outlined below.

## **FIRST PRIORITY MODULE OVERVIEW**

First Priority comprises six integrated modules. All modules interact to provide a complete management system for the health and safety needs of any organisation.

The system has been designed to provide instant response to thousands of users, to perform thousands of transactions, even over the internet or company-wide intranet.

First Priority runs on a networked personal computer and has all the features you would expect from a Windows application, for example - a graphical user interface, on-line help and the ability to interact with other Windows applications.

### **1. MESSENGER**

The Messenger is the "Backbone" of First Priority and provides the communication infrastructure and services common to all other modules.

#### **Task Management**

Types of task to be managed, include:

- Manually generated tasks, where a user may wish to initiate a particular action;

- Tasks automatically generated by different modules, for example where a modified policy requires approval or when a scheduled inspection is due;
- Recurring tasks which can be configured to occur on a regular basis, or automatically put in place to monitor a situation which is frequently outside of guidelines; and
- Tasks which are part of a work-flow and are generated as a result of preceding task.
- First Priority sets no limit to the number of tasks which can be created, linked, or related into more complex work-flows.

### **Scheduling**

All tasks, as described above, requiring intervention are scheduled based on a user-selected priority or risk rating. Once a task has been scheduled:

- resources are advised of the tasks they are required to complete;
- resources are asked to confirm their availability to carry out tasks or provide alternative dates;
- entries are made into the user's Work-in-Progress tray.
- Depending upon priority or urgency of a task, the user(s) are notified by a range of Contact Methods which include e-mail, pager, work phone or home phone and two-way radio.

### **Communicating**

All messages are sent via First Priority where possible. A queuing system sends standard messages at a given time prior to meetings or other scheduled events as reminders.

First Priority can also broadcast messages and other shared communications to selected audiences.

The content to be broadcast is available automatically or by manual intervention. Differing content can be broadcast in differing periods. For example, every Monday at shift change accident statistics can be displayed, on Tuesdays production figures, etc.

### **Security**

First Priority provides full security control over all functions, down to the screen level; and all objects, which includes tasks,

documents, static data, etc., ensuring confidentiality.

Where security must be preserved, i.e., in the case of accident investigation documents etc., then internal system policies cannot be overridden through the security function.

### **Management Review and Analysis**

Approved users can view the following statistical and summarised data and the underlying events from which that data is created. Information available includes:

- how long it takes users to respond to requests for action;
- how often events are escalated through user inaction;
- how often users access the system and for how long;
- how many activities they accomplish during each session;
- how effective groups (classifiable under any criteria) are in resolving issues;
- how effective users are in completing the assigned tasks

All categories are allocated set-points so that activity outside of a user-defined range can generate notification tasks.

## **2. REFERENCE LIBRARY**

Reference Library provides the secure environment within which all policies, compliance, legislative, standards and their related work-place procedures, check-lists, registers and other health and safety-related documents can be controlled, maintained and the information contained within them disseminated.

### **Document Identification and Control**

Any document or other electronic file pertaining to the management or conduct of health and safety related practices is maintained within Reference Library.

Only specified users are able to create, edit or modify documents. Once created and published, a rendition or view of the document is generated and made available to specified users, or groups of users. General users do not have access to the original document.

All documents are maintained to QA Standards. Reference Library's definition of a document is not limited to a word processing-

based format. A document may also be a graphical image, spreadsheet, images, videos, voice, etc.

### **Document Ownership**

Each document belongs to an Owner. The definition of an owner is generally "role" assigned. This ensures documents don't "die" when their owner changes position.

All documents must be approved by the owner before they become current. The approval process may involve documents being routed to several readers for their review and comments. At that stage the document is considered to be a draft document. The transformation from a draft to a current document status is initiated by the owner after the approval process is complete.

### **Relationships**

All relationships such as Parent document to Child document relationship are supported by Reference Library. When the parent document is modified, the owners of the child documents are automatically notified, via the Messenger, to review their documents to assess the impact.

### **Australian Standards**

The owners of documents which refer to Australian Standards supplied on CD-ROM are automatically notified when the Australian Standards are updated

### **Historical / Audit Information**

The actions pertaining to all documents are audited within Reference Library. A full history of the document's development and its life in production is kept. This includes:

- who created a document and when;
- who modified a document and when;
- who approved a document for release and when;
- who read a document and when;
- who printed a document and when; and
- who annotated a document and when.

While only the last and current version of the original document is kept, a full rendition of each document is kept.

### **Distribution**

Documents can have one or more interested parties. These are people or roles who have identified an interest in a particular document. This can be implicitly, by attaching them to the document itself, or explicitly by defining an interest in topics to which the document's contents pertain.

Reference Library supports three default interested party types for each document. They are:

- the owner
- the reviewer
- the approver

While there can only be one owner, there can be many reviewers and many approvers. Modified documents are automatically routed to each party before the document can be "published," or released for general use.

When any documents are modified, all users who have an interest in those documents are automatically notified. This includes users who have viewed or printed the current version of the document.

### **Annotations**

Users reading the documents can make comments upon the document's rendition. These comments form the basis of a task and are sent to the owner of the document. All annotations are stored with the rendition.

### **Tasks and Notification**

Any action upon documents result in a set of tasks being generated in Messenger. The tasks to be carried out depend upon what modification has been done to the document, the business rules pertaining to that document and what or who triggered the action for what reason, for example, an owner may request feedback upon a proposed change in a document.

### **Document Templates**

Creation of new documents is controlled through the use of templates. By defining the structure of each of the specified types of documents, mandatory fields, field types, field relationships etc., administrative users can enforce certain standards throughout the organisation on the creation and maintenance of documents. By adopting common

standards, each document reflects a high degree of consistency with an acceptable level of quality.

### **Document Identification and Retrieval**

Documents can be found by users through the First Priority Finder by a number of criteria, including:

- the contents of the document;
- the document name, or any other identifier;
- the document type or storage cabinet or folder;
- the owner, author, or other interested party; and
- the creation or modification date.

## **3. RISK MANAGER**

Risk Manager provides a consistent and co-ordinated approach to the identification, assessment, prioritisation and management of risk across the enterprise.

Risk Manager continually assesses every event flowing through First Priority and, by matching them to experiential data in the knowledge base, identifies risks which have the potential to cause damage.

### **Hazard Identification**

Hazards are identified by scheduled and unscheduled inspections or suggestions against standards.

Risk Manager provides several capture mechanisms to enable users to simply enter risk oriented data.

### **Scheduled Inspections**

Inspection checklists and their individual elements are stored in First Priority. An inspection checklist can be maintained by any authorised user.

Inspection checklists can be "attached" or related to any entity within the enterprise. For example, a Person checklist might relate to health, physical disability, competencies and training, and could be scheduled yearly, automatically notifying the employee, the employee's supervisor and the site doctor.

Inspections can occur at pre-set intervals allowing repetitive tasks to be defined and scheduled in for completion. Depending on the nature, duration, or resources required for the successful completion of the task, the user(s) responsible for the task are given prior

notice to enable fine-tuning of the task performance.

Supervisors are able to adjust the timing of the inspection to ensure that work-flows are maintained. If the inspection is not carried out within the defined time-frame, an escalation procedure is implemented.

The inspection can either be assigned to an individual or team. The aim is to rotate all employees through the inspection process, while retaining experience within the team.

Once an inspection has been scheduled, it is controlled by Messenger until the inspection is complete.

The inspector or inspection team is provided with all supporting documentation, for example, check-lists, standards, advice on any current actions pending, past inspection check-lists etc.

Where Risk Manager finds a condition which does not meet the required standard(s), a request for assessment is initiated.

### **QA Inspections**

QA inspections are designed to ensure that scheduled inspections are being performed according to policy. Sub-sets of full inspections are generated and assigned to another party as confirmation of the inspection process.

### **Knowledge Bank**

Knowledge Bank provides Hazard Analysis and Pre-emptive Risk Identification

- Hazard Analysis

Hazard analysis enables users to research any health or safety-related issue, including: "what-if" scenarios, which allow users to assess risk or damage potential from experiences learned at other sites; and hot-spot identification, which assesses people, equipment, procedures, shifts, locations, which are statistically at a higher risk than similar entities at other parts of the enterprise.

- Pre-emptive Risk Identification

Every safety-related event handled by Messenger is assessed for its applicability to other parts of the enterprise. If a high correlation is found to exist, loading values are applied

dependent upon: the risk-weighting of the initiating event; the history of damage in similar circumstances; and the inspection record. According to user-defined set points, inspection tasks may be sent to the person responsible for the issue to monitor the identified risk.

#### **4. INCIDENT MANAGER**

Incident Manager controls the identification, investigation, recording, analysis and corrective actions which stem from the occurrence of a damaging or potentially damaging incident.

Incident Manager generates all paperwork for external parties (e.g. worker's compensation reports, etc.), and provides a range of powerful tools for the assessment and analysis of damage.

##### ***Capturing Incident Details***

Full details of incidents are captured by First Priority via Messenger. Information captured includes objective definitions of all people, equipment and other entities involved prior to, at the time of, and after the incident.

Any other photographic or documented evidence can be attached and maintained by Reference Library.

All pre-existing documents within Reference Library relating to the entities defined as being involved in the incident are frozen and automatically attached to the incident details.

Users defined as having an interest in the incident due to its severity, location, equipment etc., are automatically notified and kept informed as to the progress of the subsequent actions.

Paper copies can be produced at any stage for statutory or other reasons.

##### ***The Investigation***

Tasks are automatically generated in Messenger to begin the investigation.

The investigation team is provided with renditions of all supporting and pre-existing documentation within security constraints. This includes details of all documentation distributed to the injured party prior to the incident, if applicable.

Investigation results can be captured in First Priority and/or the actual report can be scanned and attached to the investigation task.

At this time, all recommendations and follow-up actions are entered as tasks and other modules updated to include details of the incident.

During the course of an investigation, not all the details may be available. First Priority allows a partially-completed report to be distributed. Reasons for partial completion may range from information being unavailable, to awaiting for outside speciality groups to contribute the findings of their investigation.

Approved users can identify sections of the report to be included in a summary release for distribution to other parts of the enterprise.

An investigation is considered as outstanding until such time as it has been signed off by the investigating team leader. First Priority does not allow a sign off to occur unless nominated key details have been provided.

##### ***Follow-up actions***

All required follow-up action is scheduled and tracked by Messenger. These tasks remain part of the incident audit-trail.

##### ***Statistics***

First Priority provides a broad range of analysis and statistical tools to enable the assessment of incident experience, within the site or the enterprise.

Data can be prepared for inclusion into other enterprise or statutory reporting and analysis systems.

##### ***Administration***

From time to time a range of factors might alter which could materially affect the subsequent handling of the incident. First Priority allows additions and alterations to the incident data under strict, audited control.

#### **5. HEALTH MANAGER**

Health Manager provides the infrastructure and tools to manage the five yearly "health - check" process for workers with particular focus on early intervention.

Health Manager also assists management of site environmental monitoring, and notifies any relevant parties within the enterprise and statutory authorities.

### **Health Assessments**

Health Assessments are required by the Department of Mines and Energy to be performed at least every 5 years.

First Priority will remind the Employee, their Supervisor and the Occupational Therapist via Messenger, when their Health Assessment is due to be performed. The results of the assessment will be recorded and then filed with the Department of Mines and Energy. It will also be possible to perform Health Assessments at shorter intervals based on injury frequency, working location, role or age).

If any vulnerabilities are identified in the report, the Occupational Therapist together with the supervisor and the employee can modify the role to ensure that any restricted duties are avoided.

The process of identifying individual vulnerabilities prior to injury being sustained will be enhanced through reference to the Knowledge Base.

Information gathered during the process of assessment should be treated objectively and with confidentiality

### **Health and Environmental Monitoring**

Health and Environmental Monitoring will contribute substantially to the protection of the health of workers by:

- Identifying opportunities to control occupational exposure to hazards
- Strengthening the ability of supervisors to better understand, report on and manage workplace exposures over time and objectively evaluate the performance of safety initiatives
- Facilitate the sharing of hazard control management and control strategies across Business Units.

Occupational exposure is an important element in Health and Environmental Monitoring. Exposure measurements alone are relatively meaningless numbers unless they are accompanied by information about the circumstances that gave rise to or are associated with them.

These variables are needed to group measurements into categories that are meaningful for inferential analysis (e.g. similar exposure groups) and essential to understand and thus control exposure levels and their variability.

Health and Safety Monitoring will work together with Job Safety Analysis (JSA) to identify areas which affect the health and well being of employees.

### **Restricted Duties**

Restricted Duties are those activities which, while assessed to be generally safe, may cause damage to an employee who is recovering from an injury or has a medical condition.

Restricted Duties can be identified by the Occupational Therapist or any approved party, or automatically through comparing the employee's:

- Injury Recording

First Priority immediately generates a rehabilitation entry when an incident is captured by Incident Manager. Existing cases can be added manually.

All external documentation related to the case is automatically generated. Copies are retained within Reference Library.

All parties involved in the management of the injured employee, including the employee him or herself, receive updated reports until the case is closed. If the injury recurs or is aggravated by new set of conditions, then the facility exists for the case to be re-opened and the rehabilitation process to continue.

- Claims Management

To facilitate and control the necessary documentation involved in managing an injury, First Priority provides extensive support, including the maintenance of the following:

- third party reports, including medical and psychological reports;
- employee compensation claim forms;
- tax declarations;
- insurance correspondence;
- progress reports;
- pay details; and
- any pre-defined follow-up reports.

- Rehabilitation

While the management of every injury is unique, Rehab Manager allows users to define management templates and

then apply these templates to a particular case. Existing cases can be converted to templates, thereby capitalising on proven rehabilitation techniques or strategies.

In addition, Rehab Manager supports the following functions:

- early reporting of symptoms of injury or illness;
- early assessment and the need for rehabilitation;
- ergonomic assessment;
- regular monitoring of the status of the employee so that rehabilitation can be progressively upgraded; and
- documentation control including medical and rehabilitation documentation.

- Statistics Control

Rehab Manager provides a range of analysis tools to assess the rehabilitation process, including: the ability to calculate the actual cost of injury; rehabilitation cases which fall outside of a user-defined norm; and the identification of delays.

- First Priority Feedback

To ensure that identified risks are allocated a sufficient severity weighting, outcomes from rehabilitation cases update factors involved in the prioritisation algorithms.

## 6. COMPLIANCE MANAGER

Compliance Manager provides the framework wherein an objective assessment of site safety activity and performance can be viewed against standards.

Compliance Manager achieves this by allowing compliance categories to be defined and a profile for each category to be established. Every event handled by First Priority is automatically mapped to the most appropriate category. As a result, all health and safety issues are then assessable wholly within this context.

### **Structure Definition and Analysis**

The definition of the structure of the compliance system allows for the subsequent allocation of events to each category based on

pre-defined assessment and allocation templates.

These templates include both fixed and variable identifiers which allow for the greatest range of possible matches. Matching entries are automatically allocated without user intervention. Where an event does not fall easily within a particular category, a task is generated within Messenger to an appropriate user for manual allocation.

Each category is configured to support weighting factors and action set-points. Weighting factors are used to align all categories while set-points are used to identify the point at which a notification message is raised when a compliance category exceeds operational limits.

Once the structure is defined, analysis of all events by compliance category is possible. This feature allows a user to identify the individual events—inspections, policy reviews, incidents, etc.—in each category which remain incomplete.

### **Safety Effort by Compliance Category**

Compliance Manager provides statistical tools to allow the assessment of safety effort by category. This functionality is provided by creating a multi-dimensional matrix containing:

- Compliance categories;
- the safety-related events within each category;
- the team responsible for their performance;
- the team's effort in completing those events, including the speed of completion, and the number of escalation's

### **Compliance Simulation**

Compliance Manager generates composite inspection lists which cover previously identified areas of weakness. These lists are issued by Messenger for completion prior to an actual compliance to enhance user preparedness.

Designed to simulate the external requirements (e.g. annual NOSA or NSCA audits), these audits are generally carried out by personnel from a different operational area, a site management team, or an external consultant.



### **Compliance History**

Once complete, details are captured and linked to the operational entities by Compliance Manager.

All relevant issues identified during this process are then reviewed and assessed and, where required, corrective action items are sent to Messenger.

### **CONCLUSION**

The First Priority system is total safety risk and document management system which has been designed to enable employees and their supervisors to self manage their own safety. It gives them the tools to manage performance, whilst simultaneously providing their managers with the ability to monitor and manage process performance, eliminating the too often reactivity often associated with safety.