REGULATORY REFORM REVIEW

Report for NSW Department of Industry, Mine Safety

Noetic Group

December 2016

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EXECUTIVE SUMMARY

Mine Safety has embarked on a major regulatory reform project. Noetic was asked to carry out a review (the Noetic Review) of the regulatory reform project including assessing the strategy and its implementation. The Mine Safety reform project was stimulated in part by the Mine Safety Advisory Council (MSAC) Fatality Review[1] completed in 2014 and also by the recognition within Mine Safety of the need to develop and improve the regulatory processes.

The MSAC Fatality Review recommended a more intelligence and data led approach to regulation and a greater focus on companies' implementation of critical controls needed to prevent and minimise health and safety related mining incidents. In addition, Mine Safety recognised that to implement the MSAC recommendations, a wider set of improvements to processes, procedures and practices was required. One example was the need to ensure an appropriate and more transparent allocation of resources between so called "reactive" work (in response to incidents and complaints), versus "planned" work (such as audits and inspections). This is important because the most frequent incidents have relatively lower consequences compared to the rarer disasters. Both types of incidents must be addressed. However, prior to this reform project there was no formal system for allocating Mine Safety resources across the full range of health, safety and catastrophic hazards. To guide the reform project, Mine Safety published the *Incident Prevention Strategy* in February 2016 (the Strategy) to map out the scope, timing and extent of the changes and improvements. This was updated in October 2016 and Noetic carried out its Review in November 2016.

Noetic found that the regulatory reform project has a sound and comprehensive underpinning strategy which is being effectively implemented. The strategy identifies the data needed, the tools, systems and processes required to capture and analyse the data, covers organisational design considerations as well as the implications for staff including training and development needs. Noetic concluded that the combined effect of the changes already made, those currently in the implementation phase, plus those yet to be started, will provide a much improved regulatory regime for all stakeholders (such as industry employees and contractors, mine operators and government).

Legislation has long required (amongst other things) the identification, implementation and monitoring of risk controls by mine operators. However, the extent to which this was followed up by the regulator was variable, as was reported in the MSAC Fatality Review. A regulator more explicitly focussed on the risk controls both at an individual company level and at a pan-industry level will reinforce and support industry's own systems and approaches which typically are underpinned by a "control focussed" approach. Furthermore, this control focussed approach to managing risks, (as is required by legislation) is increasingly seen as an important part of a sustainable mining industry[2].

Noetic's approach to the review included close engagement with Mine Safety across three days at the NSW Department of Industry offices located in Maitland. Here, we reviewed relevant systems and processes, reviewed the outputs from these new processes (for example the Targeted Assessment Program (TAP) reports), and where possible spoke with those developing and implementing the processes. We also attended the Monday morning Chief Inspectors Meeting as observers to assess the progress of the project.

We were impressed by the range, depth and quality of the changes already achieved as well as those still underway. Furthermore, there was a palpable change in the confidence and capability of Mine Safety personnel we met. This was manifested in their ability to discuss and explain the improvements they were making, the rationale for these changes and the recognition of the work remaining. This is a substantial achievement.

The Noetic Review has taken place early in the change process, and our experience is that while such a complex and broad change typically requires two to three years to be fully embedded, there was clear evidence of significant improvement. Mine Safety are at a relatively early stage of the improvement process. As a result, there is still more to be done, especially in relation to the practical implementation of some of the new

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[1] MSAC Fatality Review 2013 – 2014, Noetic Solutions Pty Ltd, October 2014

[2] See for example "Risk Management: Leading Practice Sustainable Development Program for the Mining Industry, Australian Government", September 2016

approaches of which further details are given in our Report. However, Noetic was impressed with the quality and range of work completed and underway. This provides an excellent foundation for a modern risk based regulator.

INTRODUCTION

Noetic carried out a review of the progress made by Mine Safety in implementing the regulatory reform project. There were a number of stimuli for this regulatory reform project including a review of four fatal accidents in the New South Wales mining industry commissioned by the Minister in 2014, under the auspices of the Mine Safety Advisory Council (MSAC). The terms of reference for the fatality review were to:

- consider the current industry circumstances
- identify contributing factors to the incidents using information available to the Mine Safety
- explore systemic and underlying issues that may influence serious incidents.

The three recommendations in the MSAC Fatality Review 2013-14 were:

- MSAC should consider how information on the implementation of risk controls for significant risks could be routinely collected, analysed and used to support a data led incident prevention strategy.
- Drawing on the discipline of Human Factors, including human and organisational factors expertise, identify the reasons which make it more likely that risk controls will be successfully and reliably implemented.
- Consider if the regulator should explicitly focus on critical controls for significant risks as part of an incident prevention strategy.

In practice all three recommendations required the regulator (since 1 July 2016 the NSW Resources Regulator) to modify their approach to regulation. These three recommendations, (a more data led approach, more explicit consideration of human factors and a specific focus on critical controls) formed the basis for a much wider body of work intended to transform the strategic approach to mine safety in New South Wales. In February 2016 the Department of Industry published a document entitled "Mine Safety Regulatory Reform - Incident Prevention Strategy" based on these three recommendations and updated this document in October 2016. Noetic has used the updated October 2016 document as the starting point for its review of the progress made by Mine Safety in their regulatory reform project.

METHODOLOGY

Noetic's approach to the Review was informed by three main factors:

- Noetic's extensive regulatory experience, specifically in relation to high hazard industries
- The MSAC Fatality Review 2013-14
- Interviews, presentations and documents provided by Mine Safety

Noetic aimed to answer two questions:

- Are Mine Safety doing what they said they would do in the *Incident Prevention Strategy* published in February 2016?
- Are the strategy and the associated actions appropriate for a modern mining health and safety regulator, with a rich mix of mining activities? (The mining activities include underground and open cut coal mining, metalliferous mining, dimension stone and quarrying activities and many small opal mining operations).

Our method to answering these questions was to review the documented systems and processes, and where feasible, to meet those involved in developing and implementing the systems and processes. To do this we undertook close consultation at the NSW Department of Industry offices located in Maitland for three days from 7 – 9 November 2016. We attended (as observers) a Monday morning Chief Inspectors meeting and saw firsthand how some of these processes were being implemented. In other cases, for example, in relation to the newly instituted Targeted Assessment Program (TAP) we reviewed the first few outputs from this process, namely the draft reports into a number of TAPs undertaken at underground coal and metalliferous mines. In all cases we were provided with access to individuals, documents and the relevant IT systems in carrying out our Review. Full details of what we examined are contained in our Report.

Noetic has examined the Mine Safety process on a number of occasions in the past, latterly at the time of the MSAC Fatality Review but also prior to that as a result of our involvement in the 2004 Wran Review. Noetic also has significant experience working in State and Territory regulatory organisations, in Commonwealth safety regulators as well as overseas regulators. It is against this background that we reviewed the regulatory reform project.

STRUCTURE

This report is structured into sections that align with the main themes of the *Incident Prevention Strategy, February 2016*:

1. Risk-based intervention

2. Structural and Organisational Reform

3. Staff Skills Development and Tools

4. Data collection and Analysis Processes

5. Reporting

6. Conclusion

We have also included lists of:

- Annex A: Personnel Consulted
- Annex B: Documents Reviewed

1. RISK-BASED INTERVENTION

The basis of the *Incident Prevention Strategy, February 2016* is moving toward a risk-based approach to regulation. This section reviews the key processes to support risk-based intervention including:

▪ Risk profiling and hazard burden assessment

▪ Targeted assessment program (TAPs);

   + Design and intent of TAPs

   + TAP implementation

1.1 RISK PROFILING AND HAZARD BURDEN ASSESSMENT

An essential prerequisite for a rational and transparent allocation of resources is a risk assessment methodology. As was mentioned in the Executive Summary this is not straightforward when dealing with very low probability but high consequence events such as underground explosions in coal mines. It is easier to apply traditional risk assessment approaches to relatively higher frequency but lower consequence health and safety outcomes such as slips, trips, falls and musculoskeletal injuries, compared with events such as underground fires and explosions. Both types of events are important and any regulatory program must deal with both.

The *Incident Prevention Strategy* published in February 2016 recognised this and said:

> *The identification of targeted intervention strategies will be based on the need to prevent catastrophic, multiple fatality events, reduce occurrences of personal injury and embed occupational health considerations…*[3]

Mine Safety has developed an approach which addresses the inherent methodological difficulties of dealing with low probability and high consequence events and which recognises the varying risk profiles offered by different industry sectors. The approach is described in a draft document entitled "Mine Safety – Industry Risk Profiling." The main steps[4] in the process involve:

▪ Categorising mining operations based on the type of operation which in turn provides an indication of the hazards they present. There are five categories ranging from underground coal, (most hazardous) to large/medium quarries (least hazardous).

▪ Identifying which of the principal hazards identified in the legislation exist at each mine in each of the groups.

▪ Identifying the number of people at risk from the hazards.

▪ Making an assessment of the probability of the hazard eventuating.

Noetic discussed with the manager responsible for this Industry Risk Profiling process its development and use, noting this document was only recently developed and is still in draft. We were advised the Industry Risk Profiling process was first applied to underground coal operations as this type of mine presents a range of significant hazards. We were unsurprised to hear that at first some staff found the process concepts difficult to apply and adapt to. We also heard that there was some opposition to the process. However, we also heard that the initial use of the process involved a large portion of the relevant inspectors, who debated the ideas thoroughly. As a result, there is increasing acceptance and understanding of the value of the process. It is too early to provide any definitive judgement on the process. However, based on its design and intent, when fully implemented it will provide a powerful tool that will help allocate available resources in a rational manner, taking into account the range of hazards and risks mining presents in NSW.

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[3] Incident Prevention Strategy, Mine Safety Operations, p 15, published by NSW Department of Industry, Skills and Regional Development, Division of Resources and Energy, 16 February 2016.

[4] A detailed description of the process is contained in Mine Safety – Industry Risk Profiling (PROC16/50), published by NSW Department of Industry, Skills and Regional Development, Division of Resources and Energy, August 2016

1.2   TARGETED ASSESSMENT PROGRAM (TAP)

The Risk Profiling and Hazard Burden Assessment discussed in the previous section was a key step in providing greater clarity and transparency around how Mine Safety decided on what their specific regulatory priorities are and therefore how finite resources should be best used. In turn, Mine Safety has developed a range of programs to give the risk assessment process practical effect. These are called Targeted Assessments (TAPs) and cover planned, proactive assessments and a more reactive intervention program, Targeted Intervention Program (TIPS). This section of the Report discusses the proactive audits and inspections (TAPs).

At the time of the Noetic Review, Mine Safety had completed relatively few TAPs and so our comments are made in the context of a new process which was starting to be implemented. We examined TAPs related to fire and explosion, fall of ground and exposure to diesel particulate matter. We looked both at the intention of the TAPs process and its practical implementation, noting its very recent introduction.

1.2.1   Design and Intent of TAPs

Noetic took the updated *Incident Prevention Strategy* updated at October 2016, as our starting point to understand the purpose, scope and content of TAPs. This describes the intention of the TAPs being to develop a published schedule of assessments, based on the principal hazards described by mine operators in their management systems. The TAPs will assess the following key aspects of risk management:

- Have the critical controls to manage the principal hazards been identified?
- Have these controls been implemented?
- How does the operation monitor the effectiveness of these controls?

The *Incident Prevention Strategy* also explains that the findings of TAPs will be provided to the individual site and be provided in a collated and anonymised form to industry. Sharing the findings of TAPs with industry will provide allow stakeholders to see a consolidated view of how well particular hazards are managed from the evidence of the regulatory programs.

Noetic's view is that the TAPs process is an important program intended to improve the ratio of resources spent on proactive activities intended to prevent incidents. It is founded on a transparent risk-based assessment and is congruent with the legislation which (amongst other things) identifies specific mining hazards, "principal hazards" and requires operators to identify and monitor controls to manage these hazards. TAPs can also support mine operators by providing specific focus on managing the risks, thus reinforcing the companies own management systems and processes.

1.2.2   TAPs Implementation

Noetic reviewed the reports on three TAPs. These TAPs examined the management systems for the fire and explosion hazard in an underground coal mine, the fall of ground and diesel exhaust emission hazards, both in metalliferous mines.

All the TAPs involved multi-disciplinary teams and Mine Safety had produced detailed reports, mostly in draft at the time of writing this Report. It is difficult to draw conclusions from a very small sample of reports at such an early stage of implementing the TAPs process. However, Noetic can make two very preliminary observations based on the limited evidence available. We observed that:

- The TAPs reports are very detailed and consequently lengthy. We are not sure that this style of report is necessary or desirable and believe that the important issues could be expressed more succinctly.
- Although lengthy, the reports did not always give a clear explanation of what was found in relation to the controls, and specifically critical controls. We do not know the reason for this (and we did not have the opportunity to discuss this directly with the authors).

Noetic discussed these observations with senior Mine Safety personnel. They agreed with these observations and that they had already identified a number of actions intended to improve the execution of the TAPs and subsequent reports. The senior Mine Safety personnel also described that there are actions currently planned in the *Incident Prevention Strategy* that when implemented will also improve the quality of the TAPs.

One example described was the work underway to identify the typical critical controls for the Principal Mining Hazards. We understand these critical controls will be described using bow tie[5] diagrams. Noetic believes this is an appropriate way of depicting the critical controls because of the graphical links made in the diagrams between the so called "top event" (in this case the principal hazard) and the threats and consequences. A key role of the regulator is to make an independent assessment of the compliance activities of regulated entities. This requires Mine Safety to have an understanding of what they expect to find, in relation to management systems and controls in the organisations they regulate. Without describing what is expected, the regulator would not be able to compare what they find with an independent view of what is needed. Furthermore, this is a key element in securing consistency in regulatory activities. Mine Safety has also identified the need for improving the writing skills of relevant staff and the development of suitable templates to ensure important information is captured in the TAP reports.

It is difficult to draw definitive conclusions from a very small sample at such an early stage of TAP implementation. Noetic believes that the TAP process as described in the *Incident Prevention Strategy* is an essential tool for a modern health and safety regulator. It offers the promise of providing better quality feedback to individual operators and their staff, the industry as a whole and represents a rational and risk based approach to using the resources given to it by Government.

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[5] Bow ties are a method to illustrate the linkages between the potential cause of an incident or risk, and the controls or barriers that can be put in place. These controls can either prevent the initial incident and/or mitigate the consequences of the incident once it has occurred.

2. STRUCTURAL AND ORGANISATIONAL REFORM

This Review included organisational changes which have and continue to take place including some important system improvements. As with other areas we examined, much of the structural and organisational changes were a "work in progress." A significant organisational change was due to take place *after* Noetic undertook this review, namely the formation of a newly structured executive leadership group to be called the Office of the Mine Safety Regulator. This will bring together the positions including, the Director of Mine Safety Regulatory Policy, Director of Mine Safety Regulatory Strategy and Chief Inspector of Mines. Given the timing of this change, Noetic did not consider it in this review but focussed rather on those changes which had already taken place and were more susceptible to review. These included the development of the Chief Inspectors Review Meeting (CIRM), the Central Assessment Unit (CAU) and the Safety Incident Review Panel (SIRP).

2.1   CHIEF INSPECTORS REVIEW MEETING (CIRM)

Noetic attended the CIRM held on the morning of Monday 7 November as observers. The CIRM, according to the *Incident Prevention Strategy* October 2016 update is intended to:

- review information on incidents reported within the previous Thursday to Thursday seven-day cycle
- consider information from the SIRP and other sources to identify trends and areas of concern
- oversee the TAPs/TIPs/Planned Inspection process
- identify new and emerging issues
- recommend new projects, targeted assessments and other interventions.

Noetic have previously attended similar meetings whilst undertaking the MSAC Fatality Review. We were able to see how the CIRM presented data, how the data was addressed by the attendees and we were able to listen to the discussion which took place.

In practice a significant proportion of the meeting was taken up with discussion of a fatality that occurred on the previous Friday in an opal mine at Lightning Ridge. We heard how this was being managed and heard some of the difficulties in deploying and sustaining an onsite presence over several days in a relatively remote location. This was necessary not just to investigate the incident but also to work with the other agencies such as the Police to provide information and to provide support to the deceased person's family.

We were interested to hear the discussion about the incidents reported in the seven-day cycle. This information was now available via a new IT system called Assessment Compliance and Enforcement System (ACES). (Further information on ACES is provided in Section 4.2 of our Review). Noetic had examined information in the previous Common Mines Environment (COMET) information system when carrying out the MSAC Fatality Review and as a result had first-hand experience of the difficulties in the nature and quality of that data. The establishment of ACES, combined with an important organisational change, namely the centralising of the reporting of incident data, has enabled Mine Safety to have more effective approach to responding to reported incidents. In particular, deciding upon and directing investigatory and planned inspection activity. Previously, individual inspectors allocated to particular mine sites were the effective repository of incident information. This maximised the "situational awareness" of those inspectors but did not enable a more strategic view of what was happening across the mining industry. However, it was important that the particular knowledge, relationships and experience of individual inspectors was not lost.

2.2   CENTRAL ASSESSMENT UNIT (CAU)

Prior to the formation of the Central Assessment Unit (CAU), we were advised there was no centralised reporting system for incidents. There were a number of problems with this. The absence of a centralised system did not permit senior personnel to have a complete picture of the notified incidents. We also heard that

in the past some incidents (although appropriately reported by a mine and discussed with their local inspector) were emailed to Mine Safety but had in fact been sent to an incorrect email address and this had not been detected for some time. As a result, it was difficult to analyse any possible patterns or trends from the incidents based on a full set of data and this made it difficult to take a more strategic view. A more centralised system was needed but, as previously mentioned, it was important to maintain the local inspector's link to a mine.

Since the formation of the CAU, it has received and processed approximately 800 incident notifications. These notifications range from incidents that may have resulted in death, to those high potential incidents that do not pose an imminent risk to people. Notifications are entered into the ACES IT system and classified by the Duty Officer using the Event Classification Tool. The response based on the classification can vary from an immediate response to one where the information is recorded and aggregated. (This data is then available for subsequent analysis as required). Once the data is entered into ACES it is then directed to the inbox of the relevant Area Manager for review and allocation of resources such as an inspector, as required. A procedure called the Investigation Determination Procedure guides decision taking as to what is an appropriate response. In addition, on a weekly basis (as we observed at the CIRM we attended), notified incidents are reviewed to check on progress with investigations and to discuss if the response is appropriate and to make a change if necessary. The quality of the data now available has enabled a better quality decision taking system. This will benefit both the quality of the decisions and promote more consistent decision taking.

Mine Safety has now developed a centralised incident reporting mechanism, the CAU that systematically reviews and classifies the significance of incidents. The establishment of the CAU is an important step forward in gaining a holistic view of notified incidents in NSW.

2.3   SAFETY INCIDENT REVIEW PANEL (SIRP)

We were advised that the role of the Safety Incident Review Panel (SIRP) was to review incident notifications on a weekly basis and make a judgment on what action, if any, should be taken. This could range from determining the nature of an investigation, whether an investigation should be carried out at all and/or recommending any changes to Mine Safety's plan of work. SIRP makes recommendations on these issues to the Chief Inspectors Review Meeting.

Noetic discussed the workings of SIRP with an inspector who was responsible (amongst other things) for overseeing the SIRP work. We also saw that the organisational and IT improvements led to a more consistent view of the significance (or otherwise) of reported incidents, a more considered approach to deciding what to follow up (and how) and what would not be examined further. This appears to be an important step forward in developing a risk focussed Mine Safety regulator which can better discriminate between which incidents that warrant attention and those that do not.

Consequently, centralised reporting through the establishment of the CAU, supported by an effective IT system, ACES, has been combined with a system of "Primary contact inspectors" to ensure the input of the inspectors is retained. Taken together, the elements of this new approach have enabled a more co-ordinated and strategic approach to be taken.

Noetic has seen that Mine Safety have begun to make structural and organisational changes that appear to be appropriate with the aim to support the broader reform strategy. Mine Safety have started to build the basis of an effective governance structure that represent effective allocation of resources and outcome focus.

3. STAFF SKILLS DEVELOPMENT AND TOOLS

This section discusses the projects aimed at building the tools to support capability and skills development of Mine Safety staff. This section discusses:

▪ human and organisational factors

▪ training for staff and inspectors.

3.1 HUMAN AND ORGANISATIONAL FACTORS

One of the recommendations in the MSAC Fatality Review was to draw on the tools and techniques from the discipline of Human Factors to support the implementation of the critical control approach. An understanding of and a capability to apply Human and Organisational Factors (HOF) are extremely important attributes for a regulator. Almost all incidents have human and organisational factors as contributory causes and an understanding of these is essential, not just for effective incident investigation but also for prevention. However, historically regulators have sometimes found it difficult to apply HOF for a number of reasons. These typically include the apparent intangibility of the subject matter to some, exacerbated by Inspectors' core expertise often being rooted in the engineering disciplines. In addition, HOF encompasses an extremely wide range of tools and techniques ranging from individual human error models, fatigue to organisation level topics such as culture. These difficulties make it important for regulators to carefully consider which elements of HOF are most important, given the organisational priorities and its level of maturity. We discussed this with relevant personnel.

We found that Mine Safety has the benefit of knowledgeable and committed personnel in this subject area. A range of good projects were underway and we saw examples of these outputs. Training had also been provided by a well-regarded external organisation. However, it was not clear to us that HOF was as tightly integrated into the regulatory reform strategy as it could be and in our view, needs to be.

An important aspect of the regulatory reform project is to give greater focus to ensuring duty holders have identified the controls (in particular the "critical" controls) intended to prevent or minimise serious incidents and to check they are effectively managing (or monitoring) these controls. A practical manifestation of this approach is the development of bowtie diagrams and the introduction of the Targeted Assessment Program (TAP) and the Targeted Intervention Program (TIP). Both are intended to assess an organisation's implementation of control measures as required by legislation. At the time of our Review, (undertaken at a very early stage of the regulatory reform project), it was not clear how the work on HOF would directly support this renewed regulatory focus on regulated organisations' implementation of controls.

We were impressed by the interest, knowledge and enthusiasm for HOF and have no doubt that HOF tools and techniques can be developed and deployed so frontline inspectors can use HOF in a practical way to more effectively assess organisations' implementation of the legislation in relation to control risk. A number of possible ideas were discussed, including the development of tools and techniques to support Inspectors' assessments of and reporting on the quality of critical control implementation. However, we did not pursue these ideas further during the Review as this was outside our scope and felt that the staff concerned would be able to develop more and better ideas based on their more detailed knowledge of Inspectors' understanding of HOF and internal organisational priorities of Mine Safety.

3.2 TRAINING FOR STAFF AND INSPECTORS

Noetic reviewed the updated *Incident Prevention Strategy,* in October 2016 that describes a suite of projects to build skills in the inspectorate and to develop tools that support effective regulation. Building the skills of the staff and the inspectorate is an important basis to support the broader intent of the reform project.

We were advised that a training program was about to commence for all Mine Safety staff to refresh their G2 Risk Management Training. The G2 Risk Management Training is designed for individuals working in the resources industry who are required to implement the risk management system within an established system for a mine site. The training includes hazard identification, risk assessment and implementation of risk controls. The training will build a consistent base understanding of the objectives of the *Incident Prevention Strategy*, and focus on ensuring that inspectors have the capability to identify what risk controls should be in place when on site. The training would also support staff to understand the importance that mine operators are identifying and implementing appropriate risk controls and to develop a consistent approach to undertaking assessments and audits.

The *Incident Prevention Strategy* update in October 2016 also described a program to develop a training register and baseline for technical, regulatory, risk, WHS and operational training. The strategy also described a set of tools that may be developed in the future to assist inspectors. The tools included a Compliance Assessment Decision Tool (CADT) that will assist inspectors to make reliable decisions, an Inspectors Critical Control Manual that would support inspectors to focus on assessing implementation of critical controls for primary hazards and an interactive pdf inspector's manual.

From the sample of evidence Noetic reviewed, Mine Safety's plans to refresh staff training in G2 Risk Management Training appears appropriate. In addition, we also found Mine Safety have plans to further identify training gaps and to develop tools to support and assist Inspectors. We understand developing these tools will continue to build consistency across the inspectorate and a base knowledge to support further implementation of the regulatory reform.

4. DATA COLLECTION AND ANALYSIS PROCESSES

A successful risk-based intervention strategy must be based on a data led approach supported by robust data sources. Effective collection and analysis of data is important because it supports targeted intervention strategies, risk prioritisation, and resource deployment. Data analysis also enables NSW Mines Safety to support continuous industry improvement. Regulators are in a unique position as they have access to large cross section of industry data. As a result, regulators have the potential to identify insights into industry-wide trends, learnings and examples of best practice. Sharing these insights and learnings promotes continuous improvement and supports the Incident Prevention Strategy.

Mine Safety *Regulator Reform Incident Prevention Strategy*, published February 2016 describes three areas of focus to improve the provision and use of quality information. These are:

- Data collection procedures
- Data Extraction and
- Data Analysis.

Noetic set out to review the progress made on the above areas of focus. We reviewed the Mine Safety Regulatory Reform, *Implementing the Incident Prevention Strategy – Update October 2016,* and spoke with the Director Strategic Compliance, Manager Intelligence and a Principal Application Developer, from the Strategy Compliance Unit.

We were advised that in the past Mines Safety had undertaken a more reactive approach to data analysis, responding to incidents then seeking out trends and learnings. The current focus is to move toward undertaking preventative data analysis that identifies industry learnings and supports the prevention of incidents from occurring.

Mine Safety has identified a number of challenges to move toward a more preventative approach to accident prevention, supported by data. These challenges included using legacy systems that were not fit-for-purpose, analysing poor quality data and expending large amounts of time removing poor quality data. These challenges meant that extracting and analysing data was a complex and laborious process.

Noetic saw the high-level project scope and outcomes for Mine Safety Intelligence Structure developed in November 2015 and the *Mine Safety Regulator Reform Incident Prevention Strategy* described a set of projects and that aim to address these challenges.

4.1 DATA COLLECTION PROCEDURES

Mine Safety advised that a key challenge is ensuring the high quality data is collected. To address this they are developing data collection procedures that support consistency. This includes developing a classification system and taxonomy to describe incidents and investigations. The purpose of the taxonomy is to provide a common language between stakeholders and the inspectorate that will develop consistency in data in data collection. Noetic did not review the taxonomy as it was under development at the time of this report.

Noetic understands when developing new procedures, it is important to support implementation of the procedures with an appropriate change management process. The process will ensure that the users of the procedures will be informed about what the procedures are for and why they are important.

Mine Safety understand the challenges to consistent data collection and has developed a project to support data collection that appears appropriate. Noetic suggests that Mine Safety must ensure the implementation of these procedures is supported by an appropriate change management process.

4.2   MIGRATION OF DATA FROM COMET TO ACES

Noetic was advised that much of the Mine Safety's recorded incident information was kept in the legacy computerised information system COMET database with non-compliance matters being recorded in ACES.

Mine Safety has undertaken a project to migrate data from legacy systems such as COMET into a fit-for-purpose system, ACES (the new primary data recording tool). The Principal Application Developer advised at the time of this report that the data migration was approximately 90% complete. Capturing the data in the ACES system supports improvements in classification and user interface systems. The ACES system also links to external public facing forms allowing incident data to be directly captured into the system. The ACES interface allows external agencies and key industry stakeholders to link into the system.

We were advised that extracting data from the new ACES system would be a much easier task than from the previous COMET system. Noetic saw a demonstration of the ACES system and were shown how incidents can be directly reported into the system. Centralised incident reporting through the ACES System is further discussed in Section 2.2 Central Assessment Unit.

Mine Safety has developed an ACES IT System that supports centralised incident reporting. This project is well underway and is an important step in establishing an accurate and usable data set to enable a data-led approach to decision making.

4.3   DATA ANALYSIS SOFTWARE AND REPORTING

Mine Safety has developed a regular Intelligence Reporting System to that provides information on emerging trends from inspections and incidents. Noetic saw the Intelligence Reports Schedule that described the topics for monthly reporting from June to December 2016. Topics included analysis of; collisions, truck rollovers, vehicle fires and vehicle sliding. In addition, there is a monthly summary report at the end of each month. Noetic saw *the Summary Intelligence Report 2016/017, August 2016* that provided an assessment summary of vehicle fires and the role of maintenance to prevent fires. The report described insights into the leading causes of fires. Noetic understands that Mine Safety are planning to trial new software to help with data analysis with the intent of improving information to industry on incident trends.

It is clear Mine Safety has started to develop the basis of a data led approach. The systems, structures and reporting mechanisms are being developed and work is underway to improve quality of data collection processes that will support improved data analysis and reporting.

5. REPORTING

Regular reporting on business activities both within Mine Safety and for the community is important because it promotes both transparency and consistency. Internal Mine Safety reporting support sharing of information between units and develops a consistent understanding of how resources are being applied to support risk and outcome-based regulation. Publishing reports on business activities for the wider community enables transparency and builds trust in the regulator.

Noetic reviewed a number of internal Mine Safety reports including the *Monthly Business Activity Reporting for August 2016.* We also reviewed a series of published reports found on the Mine Safety website including the *NSW Resources Regulator, Monthly business activity report,* for July and August 2016*,* and a webpage of current enforceable undertakings[6]. We spoke with senior staff about the effectiveness of reporting and we understand that the reporting mechanisms are aligned with the Department of Finance's Quality Regulator Services Initiative to promote transparency and consistency in the regulator.

We saw the internal Mine Safety reports (*Monthly Business Activity Report)* for July and August 2016, which describe an overview of the compliance and non-compliance activities undertaken. The report provided an update on:

- Mine Safety activities, including the TAPs/TIPs undertaken, safety incident notifications received, activity applications received, notices issued (including notices of concern, improvement, prohibition and non-disturbance), high risk activity notifications and exemptions.

- Regulatory Audit and Investigation Unit activities, including audits undertaken and investigations commenced.

- Enforcement actions undertaken an update on enforceable undertakings, and prosecutions that have recently commenced and finalised.

- Strategic Compliance Unit activities including safety intelligence reports.

- Performance Improvement Unit status and activities.

- Education and engagement activities such as information sessions, workshops and programs.

Mine Safety publishes its activities online, including Incident Information Releases on incidents including serious incidents and high potential incidents[7]. Noetic reviewed the Investigation Information Release for a high potential incident - a coal burst on longwall face at Austar Coal Mine that occurred on 19 August 2016. The Incident Information Release described a review of the control measures associated with coal burst management and identified the contributing factors leading to the incident. The document also identified coal burst incidents in four other countries; Poland, Czechoslovakia, USA and China, and summarised the most significant contributing factors associated with coal burst events. Publishing these Incident Information Releases online is a useful mechanism that provides leadership to industry by identifying trends and reinforces a focus on controls. It is also particularly important in the case of low probability but potentially high consequence incidents to look widely for learnings from related types of incidents.

Mine Safety has developed useful reporting mechanisms to communicating regulatory reform within the Department and with the broader community and industry. The reporting assists in developing an understanding of the new reforms. We suggest there are further improvements that can be made, such as describing the controls that failed in investigation summaries. However, overall these reporting mechanisms are an improvement Mine Safety in promoting transparency and consistency in their undertakings.

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[6] Enforceable Undertakings, *NSW Resources Regulator, NSW Department of Industry,* http://www.resourcesandenergy.nsw.gov.au/regulation/compliance-and-enforcement/enforceable/enforceable-undertakings, accessed 9/11/16

[7] Incident Information Releases*, NSW Resources Regulator, NSW Department of Industry,* http://www.resourcesandenergy.nsw.gov.au/miners-and-explorers/safety-and-health/incidents/incident-updates accessed 7/12/16

6. CONCLUSION

Mine Safety has embarked upon a wide-ranging program of regulatory improvement. Importantly, the improvement program encompasses both "back office" functions as well as Mine Safety's field activities. "Back office" functions are all those processes which enable appropriate regulatory strategies to be devised and then implemented in a risk-based, data led and transparent way. An improvement program which did not involve significant change and improvement to the back office functions could not have sustained a change and improvement agenda focussed solely on the delivery of Mine Safety's regulatory services, such as the more visible activities such as inspections and investigations.

At the time of the Noetic Review, the area in which most change had taken place was in relation to those systems, processes and practices essential to the working of a modern safety regulator. These included the development of centralised reporting of incidents, the ACES IT system, and a refreshed Chief Inspectors Meeting structure and content including the formation of SIRP. Much of this Review focusses on these areas of change which are typically less visible to those looking at the work of a health and safety regulator from outside. However, they are the essential building blocks of an effective and efficient regulator.

Noetic was impressed with the range, depth and quality of activities underway. For example, the development of the prioritised list of hazards for different types of mining operations in NSW. This is a good example of where the back office analysis work was essential to ensure Mine Safety resources are deployed in a way commensurate with the nature of the risks including to mine operations where lower probability but higher consequence events were possible such as underground coal mines. This work was done collaboratively with a representative sample of Inspectors who deal with coal mines at present.

Noetic also considered how these improvements to systems and processes will support and improve the work of the more visible work of Mine Safety, such as the work of Inspectors in the field. At the time of our Review this work was in its relatively early stages of implementation. Rightly in our view, Mine Safety have focussed on building the foundations first. However, we did look at areas where these foundational improvements were starting to be implemented in the field. For example, we looked at the Targeted Assessment Program (TAP). This is an important initiative built on a solid and defensible approach to assessing how mine operators implement in practice the risk controls in accordance with the legislation. However, at the time of our visit there were only a very small number of completed reports available and it was too early in the process in our view to form any definitive judgment on the success of this program.

Noetic was very impressed with the changes already made and those underway. These are substantial, high quality regulatory improvements. These changes have delivered a strong base to support the implementation of the new processes in the field. Collectively, the changes already underway and those planned as articulated in the *Improvement Strategy* will enable Mine Safety to become a world class regulatory body and be able to demonstrate that this is the case by reference to the systems and processes they have in place.

ANNEX A: PERSONNEL CONSULTED

In this review Noetic spoke to a number of NSW Mine Safety personnel at the NSW Department of Industry offices located in Maitland. Here, Noetic attended the weekly Chief Inspectors Meeting on Monday 7 November 2016. The attendees at the Chief Inspectors Meeting were:

- Bill Barraclough, Area Manager Coal
- Mark Freeman, Senior Investigator
- Steve Brown, EMCT
- Kirsten Stoop, Project Officer
- Jenny Nash, Director Mine Safety Operations
- Steve Millington, Manager Special Projects & Development
- John Moss, Area Manager West (Metex)
- Rob McLaughlin, Area Manager East (Metex)
- Garvin Burns, Senior Inspector Safety Programs (Coal)
- Rob Mallinson, Senior Inspector Safety Programs (Metex)
- Peter Sunol, Senior Inspector Mechanical
- Owen Barry, Senior Inspector Electrical
- Gary Parker, Inspector Coal Mines
- Ian Dawes, Manager Intelligence
- Ken Cratchley, Administration Officer

Noetic also spoke with:

- Lee Shearer, Chief Compliance Officer
- David McLean, Chief Inspector
- Steve Orr, Manager Regulatory Audit & Investigations
- Cathal O'Reilly, Regulatory Coordinator
- Tony Linnane, Director Mine Safety Performance
- Anthony Keon, Director Strategic Compliance
- Edward Basile, Principal Application Developer
- John Flint, Executive Officer, Mine Safety Advisory Council

ANNEX B: DOCUMENTS REVIEWED

Noetic were provided the following documents for this review:

Central Assessment Unit (CAU) Documents

- *CAU / ACES – Entering written incident notifications;* Department of Industry Resources Regulator; 19/07/2016
- *CAU – Managing Incident Response Rosters;* Department of Industry Resources Regulator; 28/07/2016
- *CAU – Processing an Event as Monitoring;* Department of Industry Resources Regulator; 18/10/2016
- *CAU – Processing an RCM Response;* Department of Industry Resources Regulator; 18/10/2016

Governance Mechanisms

- *CAU – Engagement of Safety Managers in Incident Responses*; Department of Industry Resources Regulator; 18/10/2016

New form of planned inspection templates

- *Planned inspection – Dust and airborne contaminants*; Department of Industry Resources Regulator; (no date)
- *Planned inspection – Explosives*; Department of Industry Resources Regulator; (no date)
- *Planned inspection – Fire and Explosion*; Department of Industry Resources Regulator; (no date)
- *Planned inspection – Roads, other vehicles & transport*; (no date)

Targeted Assessment Examples (coal)

- *Targeted Assessment Report – Methane gas and Ventilation Management Appin Mine (draft)*; Department of Industry Resources & Energy; 19/07/2016
- *Targeted Assessment Report - Methane Gas and Ventilation Management Metropolitan Underground Coal Mine*; Department of Industry Resources & Energy; 05/07/2016
- *Targeted Intervention Report – Methane Gas and Ventilation Management Wambo Mine*; Department of Industry Resources & Energy; undertaken on 19/04/2016 – 20/04/2016

Targeted Assessment Planned inspection Risk profiling supporting documents

- *Concept of Operations- Mine Safety Operations Branch - the functional areas (draft)*; Department of Industry, Resources and Energy; 16/07/2016
- *Planning and Execution of Targeted Assessments, Interventions and Site Inspections*; Department of Industry, Skills and Regional Development; May 2016
- *Mine Safety – Industry Risk Profiling (draft)*; Department of Industry, Skills and Regional Development; August 2016

Targeted Assessment Program (TAP) report record examples (metex)

- *Diesel exhaust emissions TAP Report - Cadia East Mine*; Department of Industry, Skills and Regional Development; November 2016
- *Fall of Ground Targeted Assessment Program – Perilya Southern Operations mine & Potosi mine Appendices (draft)*; Department of Industry, Resources Regulator; 02/09/2016
- *Fall of Ground Targeted Assessment Program – Perilya Southern Operations mine & Potosi mine (draft)*; Department of Industry, Resources Regulator; November 2016
- *Worker exposure to harmful diesel exhaust emissions METEX - Assessment tool for Cadia East Mine*; Department of Industry, Resources Regulator; undertaken on 24/08/2016 – 25/08/2016

Other

- *Appin Colliery incident summary- Historical report based on COMET incident data*; Heather Jackson; 6/14/2016

- *Assessment and inspection strategy for the NSW mining industry*; Department of Industry Resources Regulator; Garvin Burns

- *Compliance Assessment Decision Tool (CADT) (Draft)*; Department of Industry Resources Regulator; November 2016

- *Human Factors Evaluation Review (Draft)*; Department of Industry Resources & Energy; November 2016

- *Mine Safety Regulatory Reform: Implementing the Incident Prevention Strategy – Update*; Department of Industry Resources Regulator; November 2016

- *Incident prevention strategy update*; Department of Industry Resources Regulator; 22/09/2016

- Mine Safety governance framework

- *Rasp Mine – TAP (Ground or strata failure)*; Department of Industry Resources Regulator; 13/10/2016

- *Work Management System – ACES*; Department of Industry

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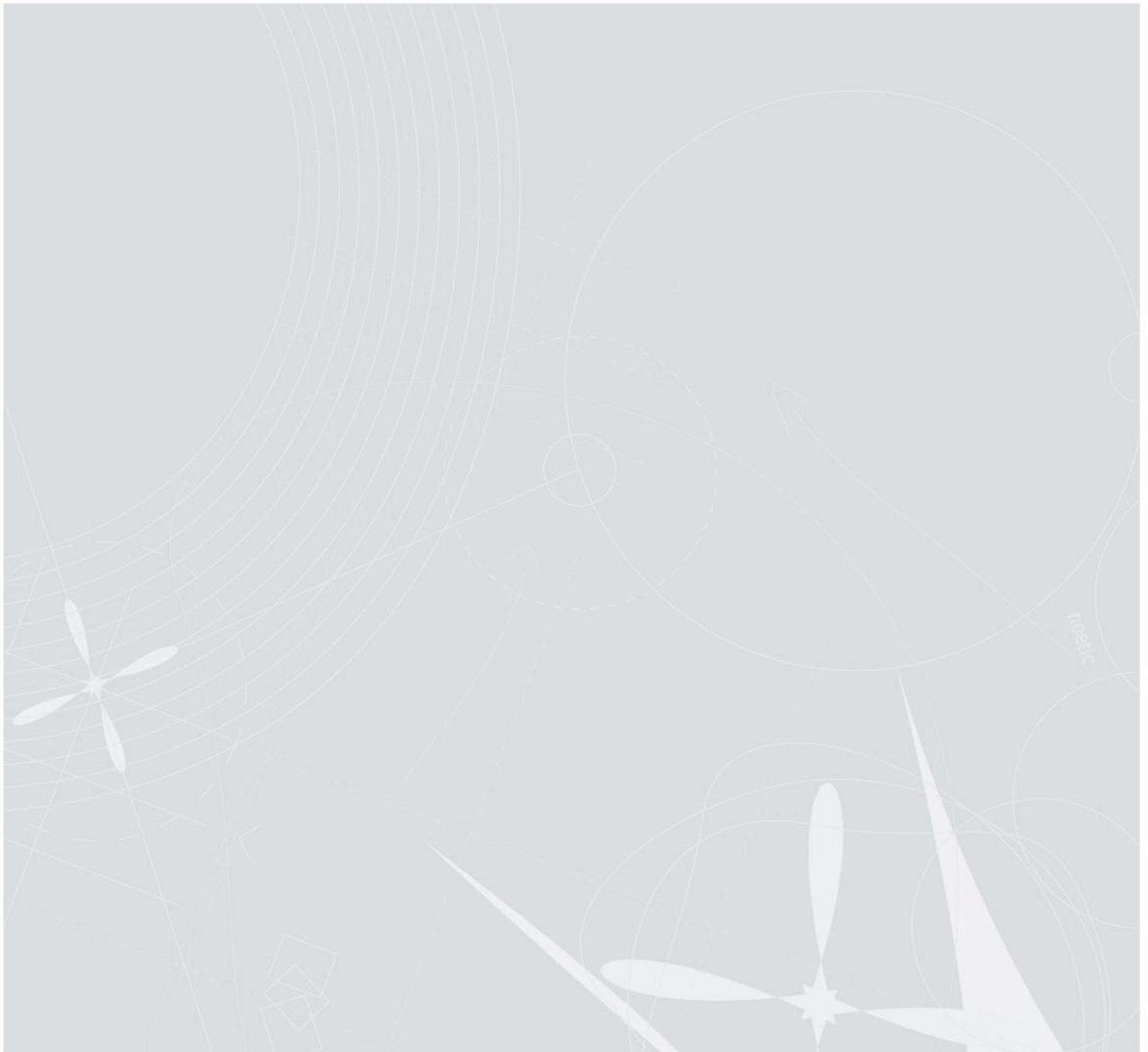

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