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NSW GOVERNMENT | Industry & Investment

Safety Audit Report

Metalliferous and Extractive Mines

Mine Safety Operations
February 2011

Cover Image: Stacked copper sheets at 99.9% purity stripped from the cathodes in the electrowinning process at the Girilambone Copper Mine near Nyngan. 21-11-1995.

Photographer: David Barnes

Report prepared by: Stephanie Lynch, MSO

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Executive Summary

Introduction

The Wran Mine Safety Review released in 2005 recommended that, the Mine Safety Operations Branch (MSOB) in Industry & Investment NSW conduct an occupational health and safety audit program at metalliferous, extractive and other non-coal mining operations across NSW. The audit program tested the legislative compliance of the main health and safety systems and plans required as part of the *Mine Health and Safety Act 2004* and associated regulation. The *Mine Safety Audit Report* was released in February 2010.

A similar program of safety audits was carried out at coal mining operations in NSW. Mining specific health and safety at these operations is dealt with under the *Coal Mine Health and Safety Act 2002* (CMHS Act) and *Coal Mine Health and Safety Regulation 2006* (CMHS Regulation).

One of the fundamental requirements under the MHS legislation is that a mine operator must prepare a Mine Safety Management Plan (MSMP) prior to commencement of mining related work (section 27 of MHS Act). The MSMP must cover certain matters set out in the legislation (section 30 of the MHS Act). One of these matters is management of contractors used at a mine through a contractor management plan (CMP) (section 30(3) (b) of the MHS Act). A CMP must be prepared by the operator of a mine at which contractors are proposed to be used, and must state how the risks arising from the use of contractors at the mine will be managed (section 37 of the MHS Act).

The CMP must also include certain matters, which are prescribed under clause 29 of the MHS Regulation. These matters involve pre-engagement assessment of contractor health and safety policies and performance, site induction, monitoring contractor compliance with OHS requirements, and consultation and communication with contractors.

A government official may audit and review the MSMP and any other arrangements for the mine required by the legislation. The audit and review may occur periodically, after the occurrence of an event prescribed by the regulation or at any other time that the government official thinks is appropriate (section 133 of the MHS Act).

Audit program

The MHS audit program assessed compliance of the MSMP and CMP documents with the requirements under the MHS Act and the MHS Regulation. Due to the large numbers of mines in NSW, a sample of mines from each region, size and type of operation were assessed.

The audit objectives were to:

- assess whether the systems for managing health and safety at NSW metalliferous, extractive and “other” mining operations (excluding coal) include all matters, plans and procedures required under the MHS Act and MHS Regulation;
- provide feedback to industry on the extent to which the systems for managing health and safety at NSW metalliferous, extractive and other mining operations comply with the relevant legislative provisions;
- identify industry-wide problems and issues in achieving compliance with the relevant legislative provisions and suggest strategies to address them; and
- establish baseline data on industry compliance with the legislative provisions to enable trend analysis in future compliance audit programs.

All inspectors and mine safety officers carrying out audits attended a safety auditor course which met the requirements for OHS Auditor Certification with the Quality Society of Australasia.

Operations to be audited were notified of the audit program and provided with a copy of the audit assessment worksheet. Table 1 below shows the number of audits included in the audit analysis by region and operation type.

Table 1: Number of operations included in MSMP and CMP audit analysis by region and operation type.

Region	MSMP Audit	CMP Audit	Mines with COMET profile
Central West	**87**	**10**	**626**
- Metalliferous	9	3	28
- Extractives	77	7	596
- Other	1	-	2
Cobar	**5**	**5**	**40**
-Metalliferous	5	5	28
-Extractives	-	-	12
- Other	-	-	-
Hunter	**118**	**8**	**214**
- Metalliferous	-	-	6
- Extractives	118	8	203
- Other	-	-	5
Northern	**22**	**2**	**422**
-Metalliferous	-	-	23
-Extractives	22	2	394
- Other	-	-	5
South East	**73**	**54**	**253**
- Metalliferous	-	-	4
- Extractives	73	54	248
- Other	-	-	1
Western	**15**	**1**	**102**
-Metalliferous	7	-	51
-Extractives	8	1	44
-Other	-	-	7
Lightning Ridge	**1**	**-**	**109**
TOTAL	**321**	**80**	**1766**

The scores from the assessment worksheets were entered in to the Industry & Investment NSW mine safety database (known as COMET). Percentage compliance ratings were calculated and score range, average and frequency identified. Comparisons were made between regions, operation types, and the type of audit.

For reporting purposes, the state was divided into seven regions. The Western region covers areas west of Narrandera to the border including around Broken Hill, south to the Victorian border and north to Wilcannia. The Central West region covers mines around Orange, Parkes and West Wyalong and south to the Victorian border. Cobar is part of the Central West inspectorate region but is reported separately for the purposes of the audit program because of the number of large metalliferous mines in the area. Hunter region covers mines on the Central Coast, the Hunter Valley and up to Gloucester and Taree. Northern region covers areas north of the Hunter Valley, including mines around Gunnedah, Narrabri, Boggabri and Armidale, and west along the Queensland border. South East covers the greater Sydney area, south along the coast to the Victorian border and west to around Canberra. Lightning Ridge is part of the South East inspectorate area but is reported separately for the purposes of the audit program due to the remote location and predominance of opal mining operations in the area.

This report collates and analyses the results of the audits carried out for a sample of mine types across the seven identified regions in NSW. It provides a snapshot of the mining industries' overall compliance with the legislative requirements regulating the MSMP and CMP systems.

The report has been structured to include an overview of the audit program as well as chapters on audit findings for MSMP and CMP assessed as part of the audit program.

Summary of audit results

The compliance scores for MSP and CMP audits broken down by region and operation type are shown in Table 2 below.

Table 2: Summary of mine safety audit results as percentage compliance with MSMP and CMP audits by region and operation type.

Percentage compliance with audit criteria					
Audit	**Region**	**Metals**	**Extractive**	**Other**	**Average**
MSP Audit	Western	75.65	65.00	-	69.97
	Central West	73.46	74.07	81.16	74.09
	Cobar	94.94	-	-	94.94
	Northern	-	82.33	-	82.33
	Hunter	-	89.45	-	89.45
	South East	-	80.70	-	80.70
	Lightning Ridge	-	86.76	-	86.76
	Average	79.30	82.23	81.16	82.03
CMP Audit	Western	82.50		-	82.50
	Central West	87.50	78.21	-	81.00
	Cobar	91.00	-	-	91.00
	Northern	-	85.00	-	85.00
	Hunter	-	75.00	-	75.00
	South East	-	79.91	-	79.91
	Lightning Ridge	-	-	-	-
	Average	88.89	79.33	-	80.41

MSMP Audit

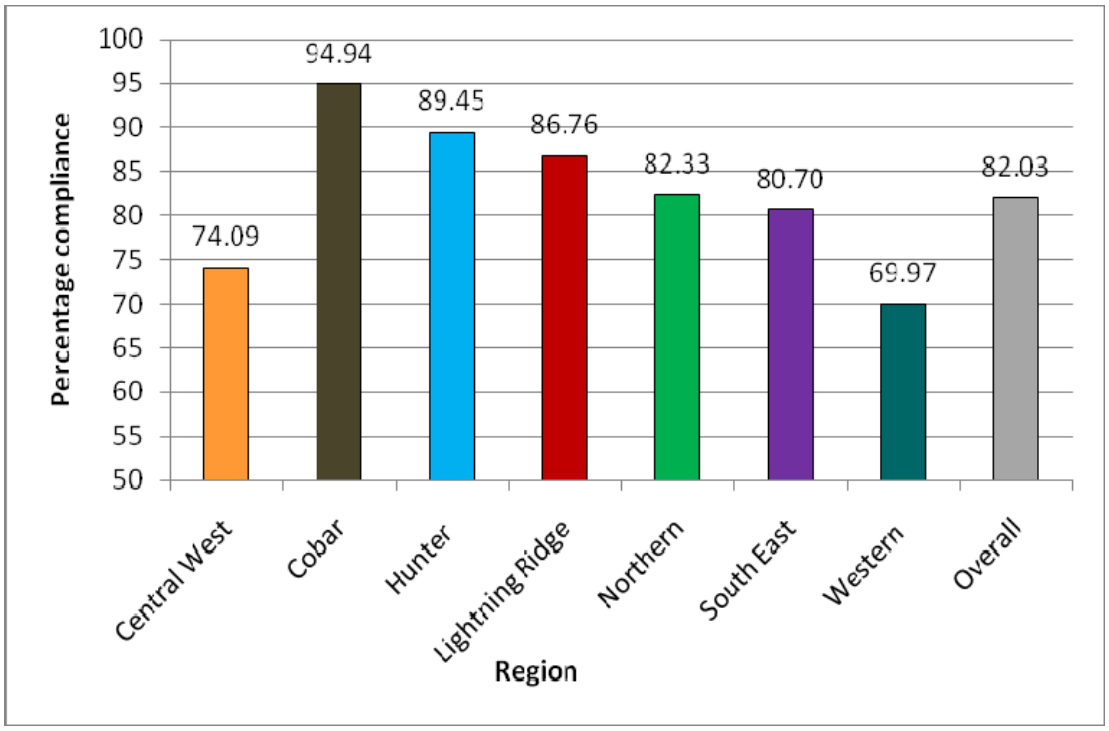
The overall compliance for the MSMP audits across the 321 operations included in the analysis ranged from 23.77% for a sand mine in the Central West to 99.42% for a sand mine in the South East region. This compares to an average of 82.03% across all operations. The highest frequency of compliance scores for individual operations was in the over 90% distribution range (131). The lowest frequency was in the less than 50% range (13), with the distribution in a negatively skewed J-curve across the distribution ranges to the highest frequency at over 90%.

As shown in Graph 1 below, Cobar operations were overall the most compliant with MSMP audit criteria, followed by operations in the Hunter region. Operations in the Central West and Western region were the least compliant. It should be noted that the mines audited around Cobar were all large metalliferous operations.

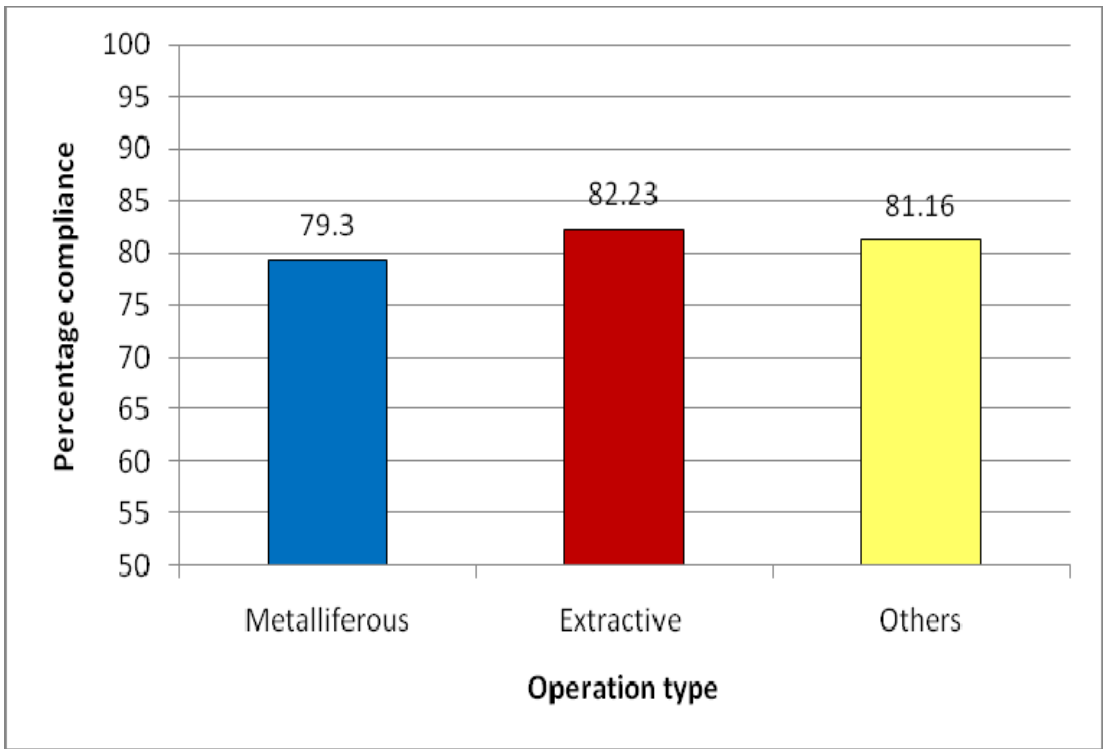
Comparing metalliferous and extractive operations, Graph 2 below shows that extractive operations scored an average of 82.23% while metalliferous operations were less compliant overall with a score of 79.30%. The single audited operation classified as 'other' scored 81.16%.

Note that 21 MSMP audits of metalliferous operations were entered into COMET at the time of analysis, out of 141 metalliferous operations with a COMET profile (ie) 14.8% of metalliferous operations returned audit results. This is compared to 298 audited extractive operations out of 1485 with a COMET profile (ie) 20.1% of extractive operations.

Graph 1: Average percentage compliance with MSMP audit by region.

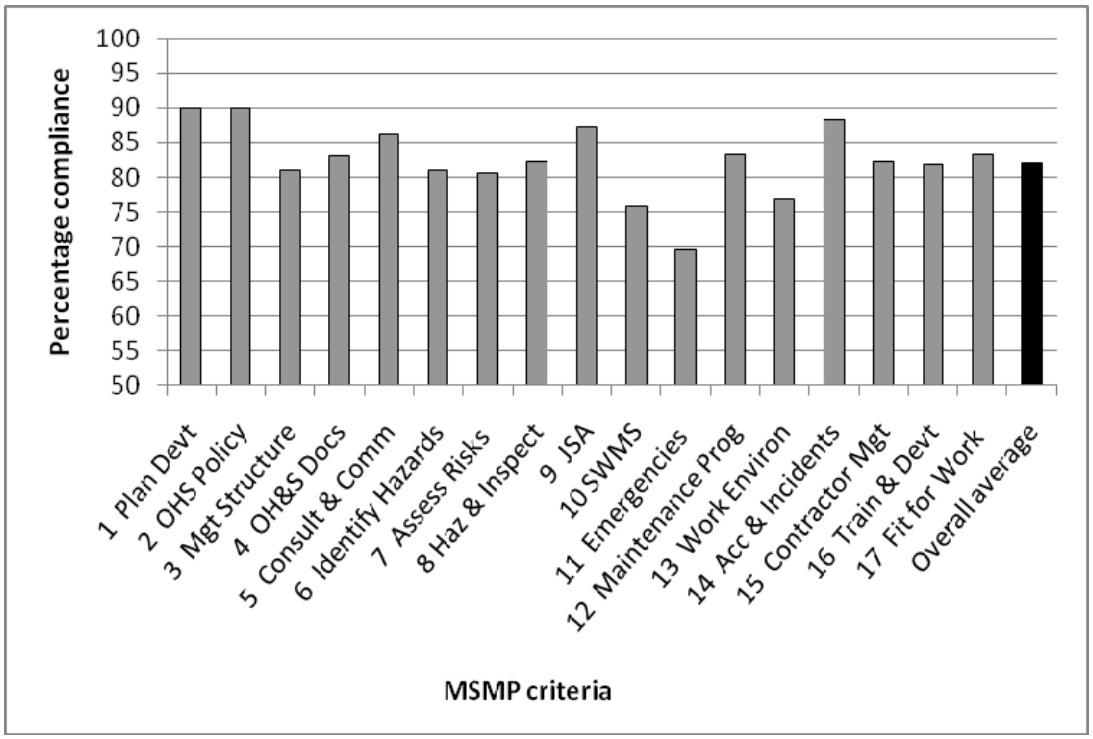


Graph 2: Average percentage compliance with MSMP audit by operation type.



Graph 3 below shows that the highest average score for a MSMP audit criterion was 89.80% for criterion 2 (safety and health policy) followed by 89.34% for criterion 1 (MSMP development) and 88.69% for criterion 14 (reporting accidents and incidents). The lowest overall average score was 69.83% for criterion 11 (emergency preparedness).

Graph 3: Average percentage compliance scores for MSMP audit criteria.



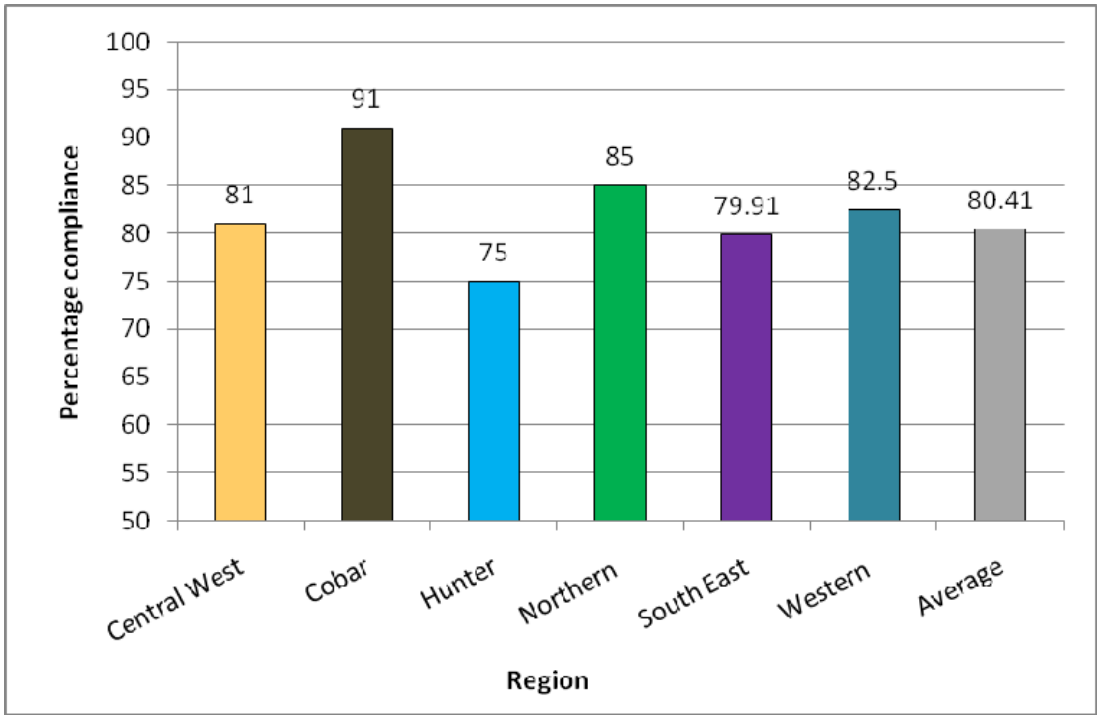
CMP Audit

The overall percentage compliance across the 80 mining operations included in the CMP audit analysis ranged from 37.50% to 100% with an average of 80.41%. The highest number of operations (30) fell in the 80-90% distribution range. The ranges of 70-79.99% and over 90% contained 16 and 18 operations respectively. Five operations scored below 50%.

Graph 4 below shows the overall average compliance scores for the CMP audit by region. The large metalliferous mines around Cobar were the most compliant with the CMP audit criteria, achieving the highest overall compliance score of 91%. Northern region operations scored an average of 85% and Western region 82.5% compliance.

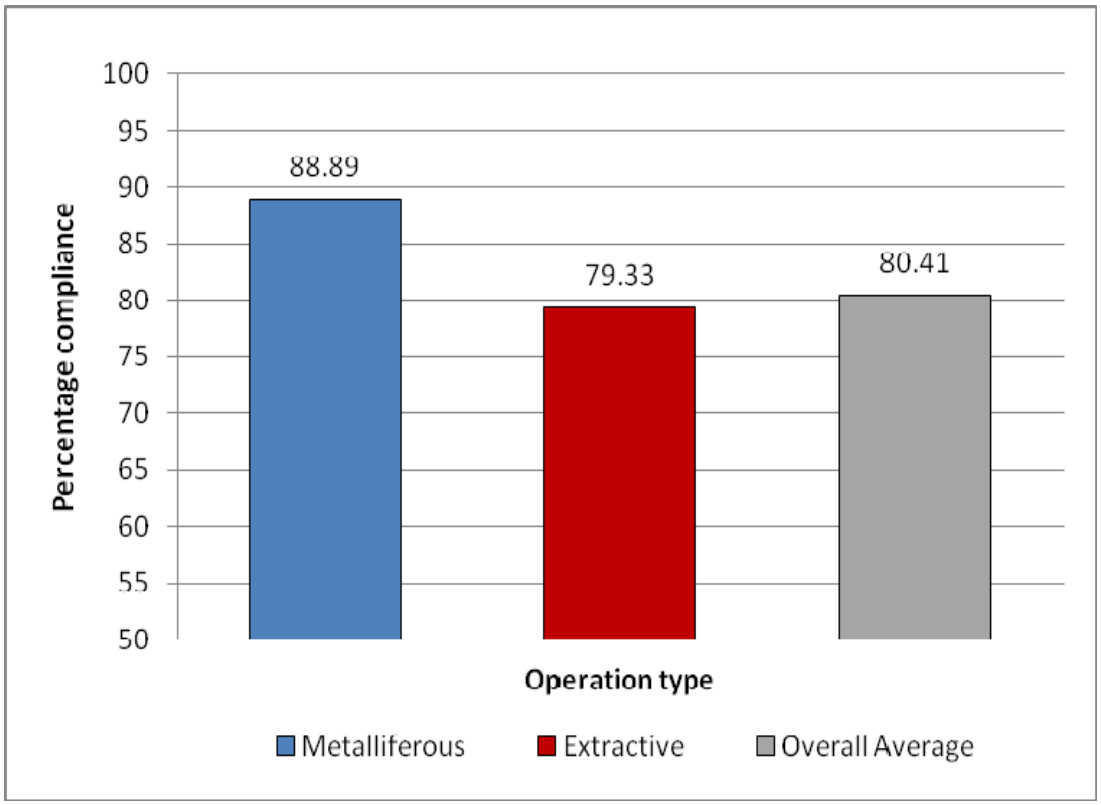
The Central West had the next highest overall compliance score of 81%. The South East had the highest number of operations included in the CMP audit analysis, with an average for operations in this region of 79.91% compliance. Hunter region operations averaged 75%.

Graph 4: Average percentage compliance with CMP audit by region.



Looking at operation types, metalliferous mines were the most compliant with an average compliance rate of 88.89%. Extractive operations scored 79.33% compliance overall (see Graph 5).

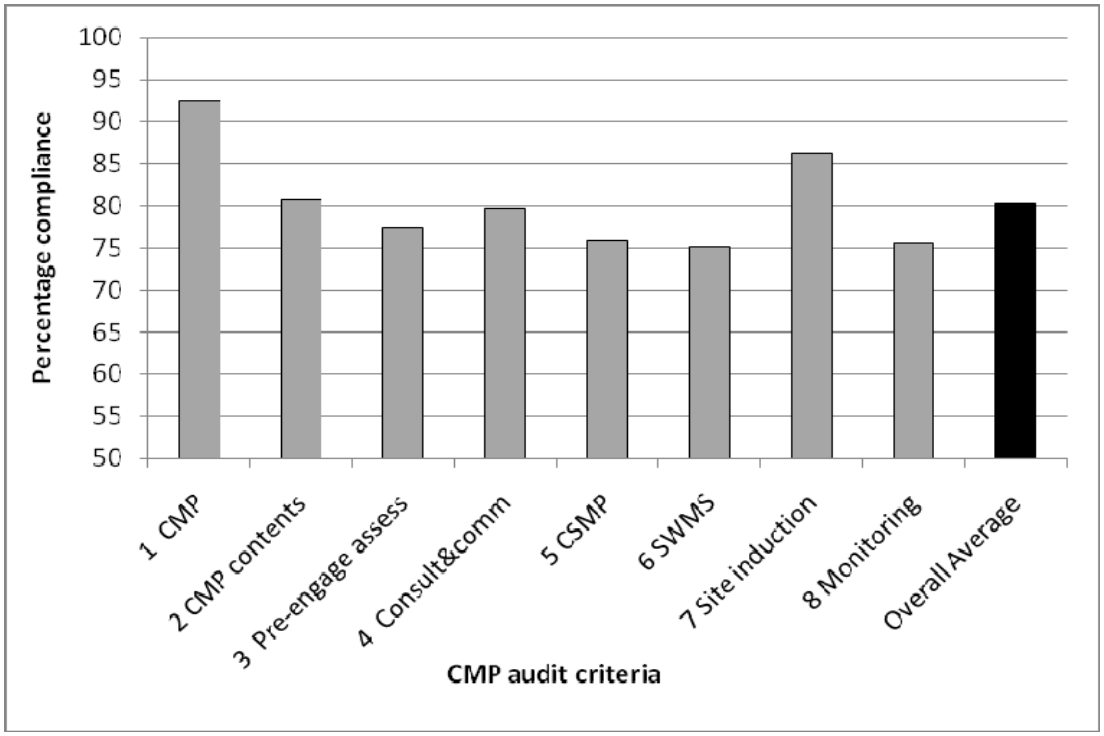
Graph 5: Average percentage compliance with the CMP audit by operation type.



Graph 6 below shows that the highest scoring criterion overall for the CMP audit was criterion 1 testing the existence of a CMP in accordance with the MHS legislation (92.5%). Criterion 7 about site induction of contractors was next highest (86.25%), followed by criterion 2 about CMP contents (80.75%). All other criteria scored less than 80%.

The least compliant criteria overall were criterion 5 dealing with contractor safety management plans (72.25%), criterion 8 testing monitoring of contractors (75.5%) and criterion 6 dealing with SWMS (75.75%).

Graph 6: Average percentage compliance for CMP audit criteria across operations.



Conclusion

The objectives of the audit have been achieved.

The audit results indicate that while some mines are achieving a high level of compliance with the requirements in the MHS legislation for MSMPs and CMPs, many other mines are yet to comprehensively cover these requirements in their policy and procedure documents. This is reflected in the overall industry-wide averages achieved for both the MSMP and CMP audits.

The overall averages for the MSMP and CMP criteria further indicate particular areas of low compliance across the industry. In general, the least compliant criteria in the MSMP audit dealt with emergency preparedness, SWMS, and hazards in the work environment. Audited operations also did not score as highly overall as might have been expected in some areas fundamental to understanding and implementing a risk-based approach to OHS. For example, the criteria testing reporting of hazards and workplace inspection, the identification of hazards, assessing risks each scored less than 83%. The criteria testing the documented management structure also scored just over 80%, which was lower than might have been expected given the administrative nature of the requirement.

For the CMP audit, the criteria dealing with pre-engagement assessment, consultation and communication, monitoring of contractors, SWMS and contractor safety management plans all

scored less than 80%. The lack of integration of contractors into OHS systems at mining operations has been discussed in previous mine safety reviews and was the focus of many of the recommendations made in the Wran Report. The results of the CMP audit indicate that many mines have yet to fully integrate contractors into site OHS systems and practice.

One of the main challenges in achieving high levels of legislative compliance across the metalliferous and extractive mining industry is the range in size and nature of the operations. Many operations are small or operated on an intermittent basis, particularly in the extractive sector. These operations cannot be expected to be as well resourced as substantial, fully operational mines operated by large companies. These differences appear to be reflected in the results, for example, the high levels of compliance achieved by the large metalliferous mines around Cobar.

I&I NSW has been addressing this challenge through several initiatives such as publication of the Minerals Industry Handbook, the Small Mine Safety Management Kit, and the Risk Management Pocket Guide, as well as workshops and seminars on aspects of OHS conducted throughout NSW. The results of this audit program will be used for discussion and development of further initiatives to focus on less compliant areas of the industry. Feedback has already been provided to individual mines that took part in the audit program, but further feedback of the overall audit results will occur with consultation about future strategies to increase understanding and compliance with requirements. The less compliant operations will be provided with ongoing assistance and feedback on an individual basis. Enforcement action will be taken where required.

The results of this audit program form an important part of baseline information that can be used to assess improvements in understanding, adoption and implementation of risk-based OHS in the mining industry. The audit program has also assisted audited operations to understand the process of documenting systems based on legislative requirements. However, due to legislative changes through the national OHS process, direct comparison with the results of compliance audits carried out after the new legislation is in place may not be possible.

This report was made possible by the dedicated efforts of all metalliferous and extractives inspectors to prepare and undertake the audits while maintaining their regulatory roles to administer and enforce the *Mine Health and Safety Act 2004 and Regulation 2007.*

Rob Regan
Director Mine Safety Operations
Chief Inspector

1. Introduction

1.1 Description of metalliferous, extractive and "other" mining in NSW

For the purposes of reporting and data analysis, mines are grouped into the following three operation types.

Metalliferous

Metalliferous mining is concentrated in the central-west of NSW (see Figure 1.1). The metalliferous industry in NSW is a major producer of metals and metallic minerals such as gold (Au), silver (Ag), lead (Pb), zinc (Zn), copper (Cu), nickel (Ni) and cobalt (Co). Gold and copper are the most significant in terms of production value. Production of gold in particular has increased significantly in the past 10 years, supported by large operations such as Northparkes (Parkes), Cowal (West Wyalong), Peak Gold Mine (near Cobar), and Cadia Valley Operations (Orange). NSW is now Australia's second largest producer of gold after Western Australia.[1]

Extractive

Extractive mining refers to production of construction materials and industrial minerals.

Industrial minerals include diverse range of mostly non-metallic commodities such as clay, dolomite and limestone. Many industrial minerals are used in the production of materials such as bricks, glass, cement and ceramics. NSW is a major producer of industrial minerals for domestic and export markets. The industry is mainly located in the New England and the Murray-Darling Basin regions (see Figure 1.2).

Construction materials include sand and coarse aggregates used in large quantities for buildings, roads and other infrastructure. These operations are mainly located within reach of large population centres along the east coast, such as Wollongong, Newcastle, Coffs Harbour and the greater Sydney region (see Figure 1.3).

According to available figures, metallic mineral production is $3.6 billion in 2006-07, compared to $408 million for construction materials and $201 million for industrial minerals.[2]

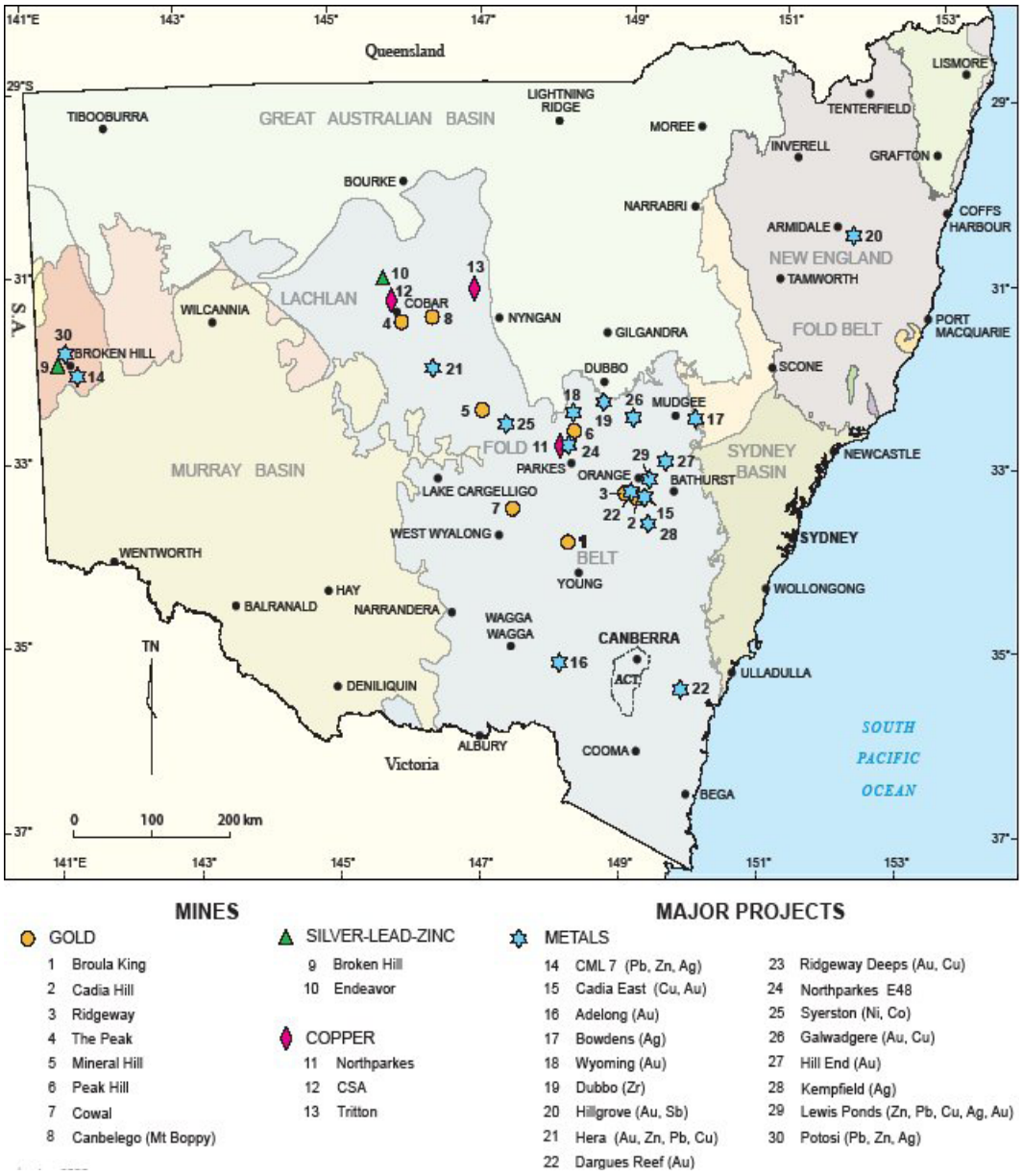
"Other"

Mining operations included in this category include gemstone and opal mines, as well as operations ancillary to mining such as treatment plants. Of the gemstones, sapphires have historically been one of the most economically important but production has been decreasing. Exploration for diamonds has been increasing, particularly in the New England region.[3]

Opal mining is centred on Lightning Ridge, with some opal mining also occurring at White Cliffs. The Lightning Ridge opal fields are the world's main source of black opals.[4]

[1] NSW Department of Primary Industries, *Minerals Industry Annual 2008*, page 63.
[2] NSW Department of Primary Industries, *Minerals Industry Annual 2008*, page 4.
[3] NSW Department of Primary Industries, *Minerals Industry Annual 2008*, page 86.
[4] NSW Department of Primary Industries, *Minerals Industry Annual 2008*, page 86.

Figure 1.1: Major metallic mines and projects in NSW[5]



MINES

GOLD
1 Broula King
2 Cadia Hill
3 Ridgeway
4 The Peak
5 Mineral Hill
6 Peak Hill
7 Cowal
8 Canbelego (Mt Boppy)

SILVER-LEAD-ZINC
9 Broken Hill
10 Endeavor

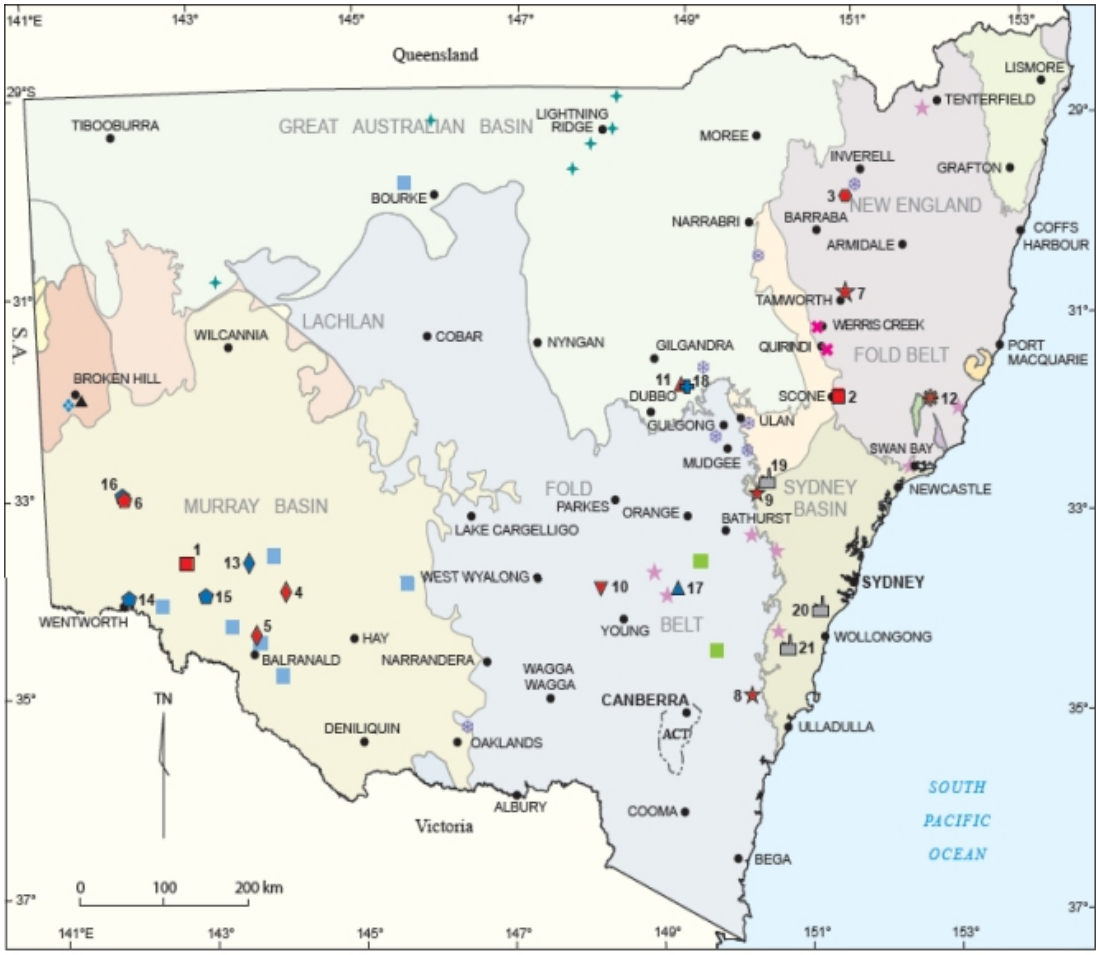
COPPER
11 Northparkes
12 CSA
13 Tritton

MAJOR PROJECTS

METALS
14 CML 7 (Pb, Zn, Ag)
15 Cadia East (Cu, Au)
16 Adelong (Au)
17 Bowdens (Ag)
18 Wyoming (Au)
19 Dubbo (Zr)
20 Hillgrove (Au, Sb)
21 Hera (Au, Zn, Pb, Cu)
22 Dargues Reef (Au)
23 Ridgeway Deeps (Au, Cu)
24 Northparkes E48
25 Syerston (Ni, Co)
26 Galwadgere (Au, Cu)
27 Hill End (Au)
28 Kempfield (Ag)
29 Lewis Ponds (Zn, Pb, Cu, Ag, Au)
30 Potosi (Pb, Zn, Ag)

[5] I&I NSW at http://www.dpi.nsw.gov.au/minerals/resources/mineral/map-major-mineral

Figure 1.2: Map of major industrial mineral operations and projects in NSW.[6]



REFERENCE

MAJOR INDUSTRIAL MINERAL MINES

- Bentonite
  - 1 Arumpo
  - 2 Cressfield
- Diatomaite
  - 3 Barraba
- Gypsum
  - 4 Norms
  - 5 White Plains
- Heavy Mineral Sands
  - 6 Ginkgo
- Limestone
  - 7 Attunga
  - 8 BCSC Marulan
  - 9 Kandos
- Magnesite
  - 10 Thuddungra
- Magnetite
  - 11 Tallawang
- Ruby
  - 12 Gloucester

SIGNIFICANT PROJECTS

- Gypsum
  - 13 Paxton
- Heavy Mineral Sands
  - 14 Euston
  - 15 Prungle
  - 16 Snapper
- Magnetite
  - 17 Broula
- Zirconia and Rare Earth Elements
  - 18 Dubbo Zirconia

MAJOR PROCESSING PLANTS

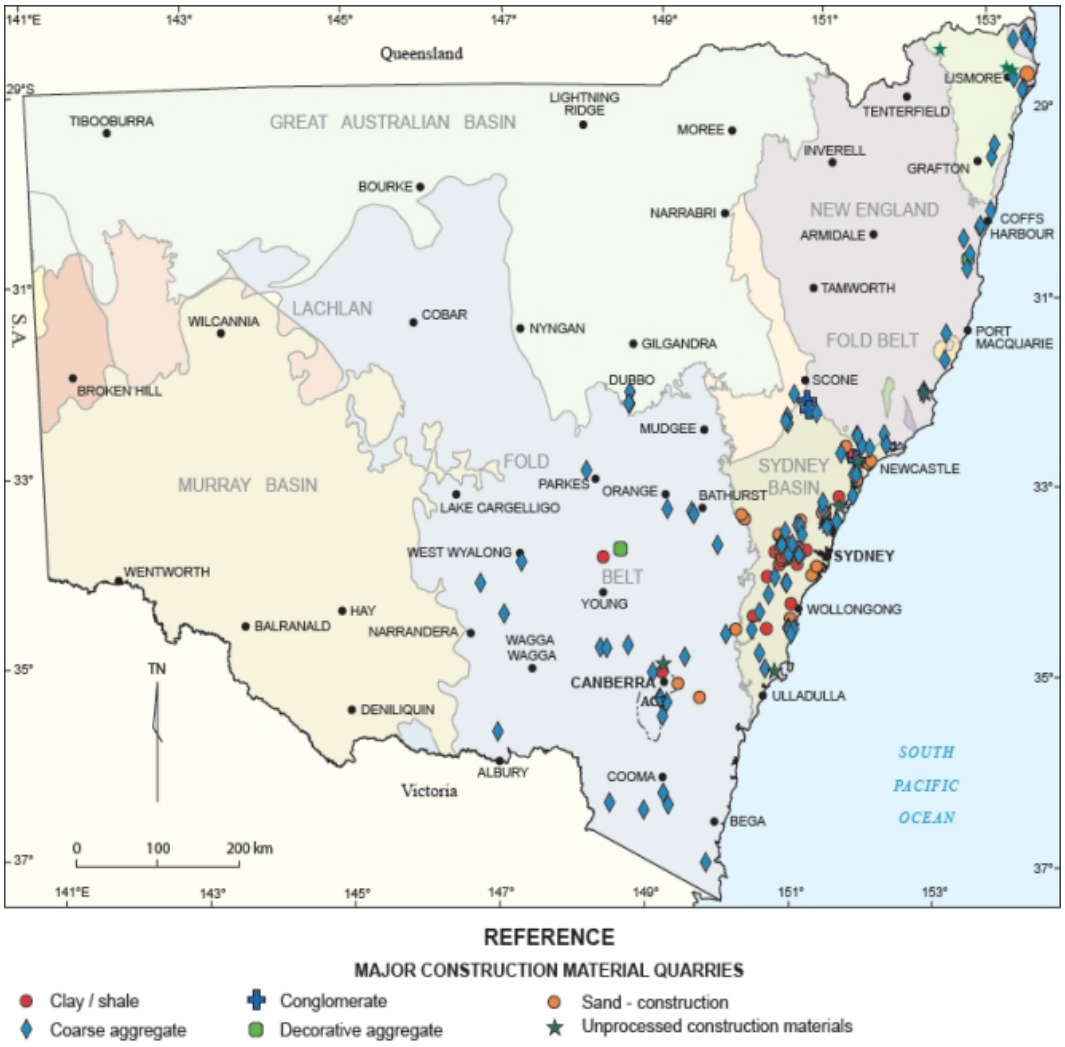
- Cement Works
  - 19 Cement Australia, Kandos
  - 20 Blue Circle Cement, Berrima
  - 21 Blue Circle Cement, Maldon
- Broken Hill mineral sand separation plant

MAJOR DEPOSITS

- Barite
- Garnet
- Gypsum
- Kaolin clays
- Opal
- Silica
- Zeolites

[6] I&I NSW at http://www.dpi.nsw.gov.au/minerals/resources/mineral/map-major-mineral2:

Figure 1.3: Map of major construction material mines and projects in NSW.[7]



1.2 Mine Safety Regulatory Framework

Occupational health and safety (OHS) at mining workplaces is regulated through both general and mining-specific OHS legislation. Health and safety at mines other than coal mines is specifically addressed in the *Mine Health and Safety Act 2002* (MHS Act) and the *Mine Health and Safety Regulation 2006* (MHS Regulation). The MHS legislation commenced on 1 September 2008 as part of an overall reform of mine safety legislation aimed at developing a risk-based approach to workplace safety.

[7] I&I NSW at http://www.dpi.nsw.gov.au/minerals/resources/mineral/map-major-metallic

The objects of the MHS Act are as follows:

(a) to assist in securing the objects of the Occupational Health and Safety Act 2000 *at mines (including the object of securing and promoting the health, safety and welfare of persons at work at mines or related places),*
(b) to ensure that the particular hazards associated with mines are identified and that risks arising from those hazards are assessed and eliminated or controlled,
(c) to ensure that effective provisions for emergencies are developed and maintained at mines,
(d) to ensure that managers, supervisors and employees are competent, by ensuring that appropriate health and safety competencies are defined and are implemented in the mining and quarrying industry.

In order to achieve these objectives, the MHS Act requires a number of safety management plans to be in place prior to the commencement of mining. These management plans deal with identification, assessment and management of hazards of particular relevance to mining operations.

The overarching plan required under the MHS legislation is a mine safety management plan (MSMP). The MSMP is a statement of how the health and safety of people at the mine will be protected. An operator must ensure that mining-related work is not carried out until a MSMP that complies with the MHS Act and Regulation is implemented (sections 27 and 28 of the MHS Act). The required content for a MSMP is discussed further in Chapter 3 of this report.

A MSMP must include a range of information that goes to identification of hazards and management of the risks that arise from those hazards. Section 30 of the MHS Act sets out the content required in the MSMP. This content includes any Contractor Management Plan (CMP) that is required under Part 5, Division 2, Subdivision 4 of the MHS Act.

A CMP must be prepared by the operator of a mine where contractors are proposed to be used and must state how the risks arising from the use of contractors at the mine will be managed (section 37 of the MHS Act). The CMP must include the matters set out in the MHS Regulation (section 38 of the MHS Act and clause 29 of the MHS Regulation). These matters are also discussed in more detail in Chapter 3 of this report.

The MHS legislation covers operations that range in type and size. It is unreasonable to expect a single person opal mine or small, intermittent, family-owned sand mine to have the same extent and depth of documentation as a large underground metalliferous operation. As such, the MHS Act is intended to be applied in a proportional manner, so that smaller operations are only required to do what is reasonable in relation to their size and level of risk.

A government official may audit and review the MSMP and any other arrangements for the mine required by the legislation. The audit and review may occur periodically, after the occurrence of an event prescribed by the regulation or at any other time that the government official thinks is appropriate (section 133 of the MHS Act).

As indicated by the objects of the MHS Act, the mining-specific legislation works with the *Occupational Health and Safety Act 2000* (the OHS Act) and the *Occupational Health and Safety Regulation 2001* (OHS Regulation) to provide a comprehensive framework for health and safety in the NSW mining industry. Application of the OHS Regulation was extended to fully apply to the mining industry (with some exceptions) on 1 September 2008.

1.3 Wran Mine Safety Review

The Report of the NSW Mine Safety Review conducted by Neville Wran (the Wran Report), released in 2005, recognised that the risk-based approach to mine safety must be supported by mechanisms for the regulator to check compliance of OHS management systems with the law. Auditing was identified as one of the key methods that regulators can use to check compliance.

Although the Wran Report focused on the coal mining industry, the recommendations in relation to checking the legislative compliance of health and safety management plans are equally relevant to other mining operations. In summary, the recommendations of the Wran Report relevant to this audit program are as follows:

- Recommendation 4 : relevant legislation to be subject to audit and review 24 months after commencement;
- Recommendation 17: the regulator conduct a major audit of practice, performance and compliance of contractor management provisions in the relevant legislation two years after commencement;
- Recommendation 18: the regulator monitor and audit contractor management systems; and
- Recommendation 25: mine safety inspectors regularly check (monitor, audit, inspect, observe) the implementation of risk management plans and safety management systems in general.

The Wran Report also recommended that the role of the mine safety inspectorate be supported by ensuring adequate staffing, training, funding and resources (Recommendation 27).

The recommendations of the Wran Report were in relation to application of the *Mine Health and Safety Act 2004* (MHS Act) and associated regulation at other mining operations and to application of the CMHS legislation coal operations in NSW. Both the MHS Act and the CMHS Act require an operator to develop and implement an overarching health and safety plan for a mine prior to the commencement of mining, which must include a contractor management plan.

1.4 Health and safety performance in the NSW mining industry

In the past decade, there has been a significant reduction in the rate of fatalities and serious injury in the mining industry. Information compiled by I&I NSW shows that the five year average frequency rates for serious bodily injury and fatalities have trended downwards in that time (Graph 1.1), as has the five-year frequency rate for lost time injuries (Graph 1.2).[8]

This reduction in injury and fatality rates is at least partly the result of an acceptance and adoption of a broader risk management approach to OHS in both legislation and mining practice, provision of training and information by government and industry, and development of clear expectations about OHS culture and performance. However, the goal of zero fatalities and serious injuries in the mining industry is still to be achieved.

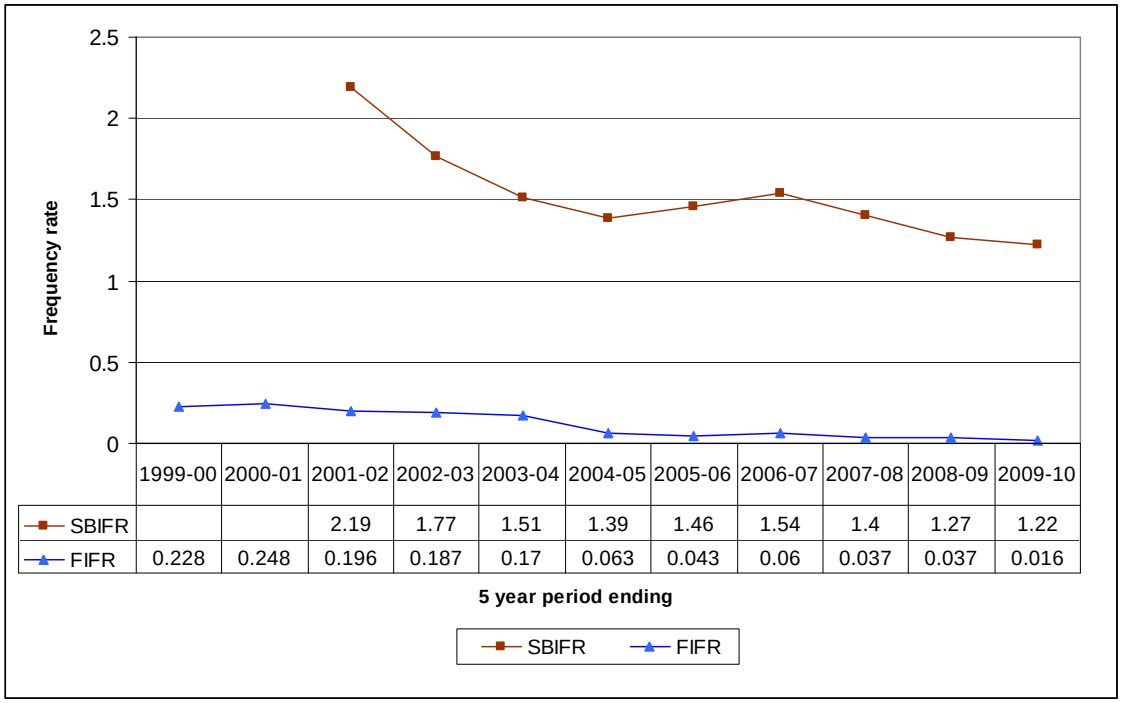
I&I NSW records mine safety performance statistics through the Safety Performance Measures program. This program facilitates collection, analysis and reporting of mine safety data. Information about assessments, incidents, notices, complaints, approvals and authorisations are recorded in the Common Mines EnvironmenT (COMET) database. A comprehensive report analysing data captured in the COMET database was released in December 2010. This report, called the *Mine Safety Performance Report 2009-2010,* can found on the I&I NSW website.[9]

[8] Data from I&I NSW, *NSW Mine Safety Performance Report 2009-10*, pages 2 and 3.

[9] http://www.dpi.nsw.gov.au/__data/assets/pdf_file/0019/368011/NSW-Mine-Safety-Performance-Report-2009-10.pdf

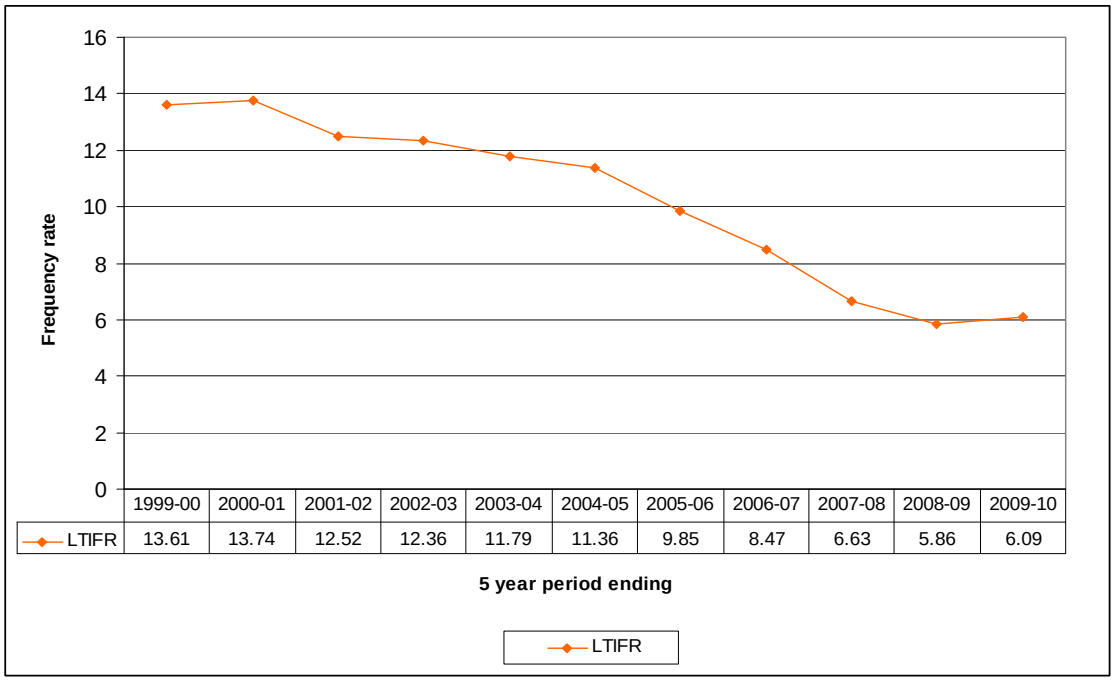
The data recorded in COMET includes certain incidents, events and injuries that a mine operator must notify the Chief Inspector about under the MHS Act (section 88(1)). These 'notifiable incidents' include fatalities and other incidents or matters prescribed under the regulation. The prescribed notifiable incidents are set out in clauses 145 and 146 of the MHS Regulation. Other incidents and events that are not 'notifiable' under the MHS legislation such as complaints and 'high potential' incidents are also recorded.

Graph 1.1: Five-year average fatal injury frequency rate (FIFR) and serious bodily injury rate (SBIFR) for metalliferous and extractive mines in NSW.



	1999-00	2000-01	2001-02	2002-03	2003-04	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10
SBIFR			2.19	1.77	1.51	1.39	1.46	1.54	1.4	1.27	1.22
FIFR	0.228	0.248	0.196	0.187	0.17	0.063	0.043	0.06	0.037	0.037	0.016

Graph 1.2: Five-year average lost-time injury frequency rate (LTIFR) for metalliferous and extractive mines in NSW.



	1999-00	2000-01	2001-02	2002-03	2003-04	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10
LTIFR	13.61	13.74	12.52	12.36	11.79	11.36	9.85	8.47	6.63	5.86	6.09

Analysis of COMET data shown in Table 1.1 indicates there was a total of 2499 incidents recorded at metalliferous, extractive and other non-coal mining operations in the 10 years since 1999-00.[10] This includes 312 incidents notified under clauses 145 and 146 of the MHS Regulation since the commencement of that legislation in September 2008.[11]

Underground metalliferous operations have consistently reported the highest number of incidents during the past 10 years, recording a total of 1218 incidents. Surface extractives operations reported the next highest number of incidents, with 836 recorded incidents from 1999-00, followed by surface metalliferous operations with 396 recorded incidents.

Table 1.1: Number of incidents recorded at metalliferous, extractive and other non-coal mining operations from 1999-00 to 2009-10.[12]

Operation Type	Mine Category	1999-00	2000-01	2001-02	2002-03	2003-04	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	Total
Surface	Metalliferous	38	18	30	26	34	39	39	34	36	41	61	396
	Extractives	102	71	74	97	70	78	62	70	62	73	77	836
	Non-Coal Other	9	2	1	3	2	1	3	1	2	1	1	26
	Total	**149**	**91**	**105**	**126**	**106**	**118**	**104**	**105**	**100**	**115**	**139**	**1,258**
Underground	Metalliferous	139	101	111	106	102	108	116	114	94	103	124	1,218
	Extractives	-	-	-	-	1	5	6	1	2	1	2	18
	Non-Coal Other	-	-	-	-	2	-	-	-	-	1	2	5
	Total	**139**	**101**	**111**	**106**	**105**	**113**	**122**	**115**	**96**	**105**	**128**	**1,241**
Total		**288**	**192**	**216**	**232**	**211**	**231**	**226**	**220**	**196**	**220**	**267**	**2,499**

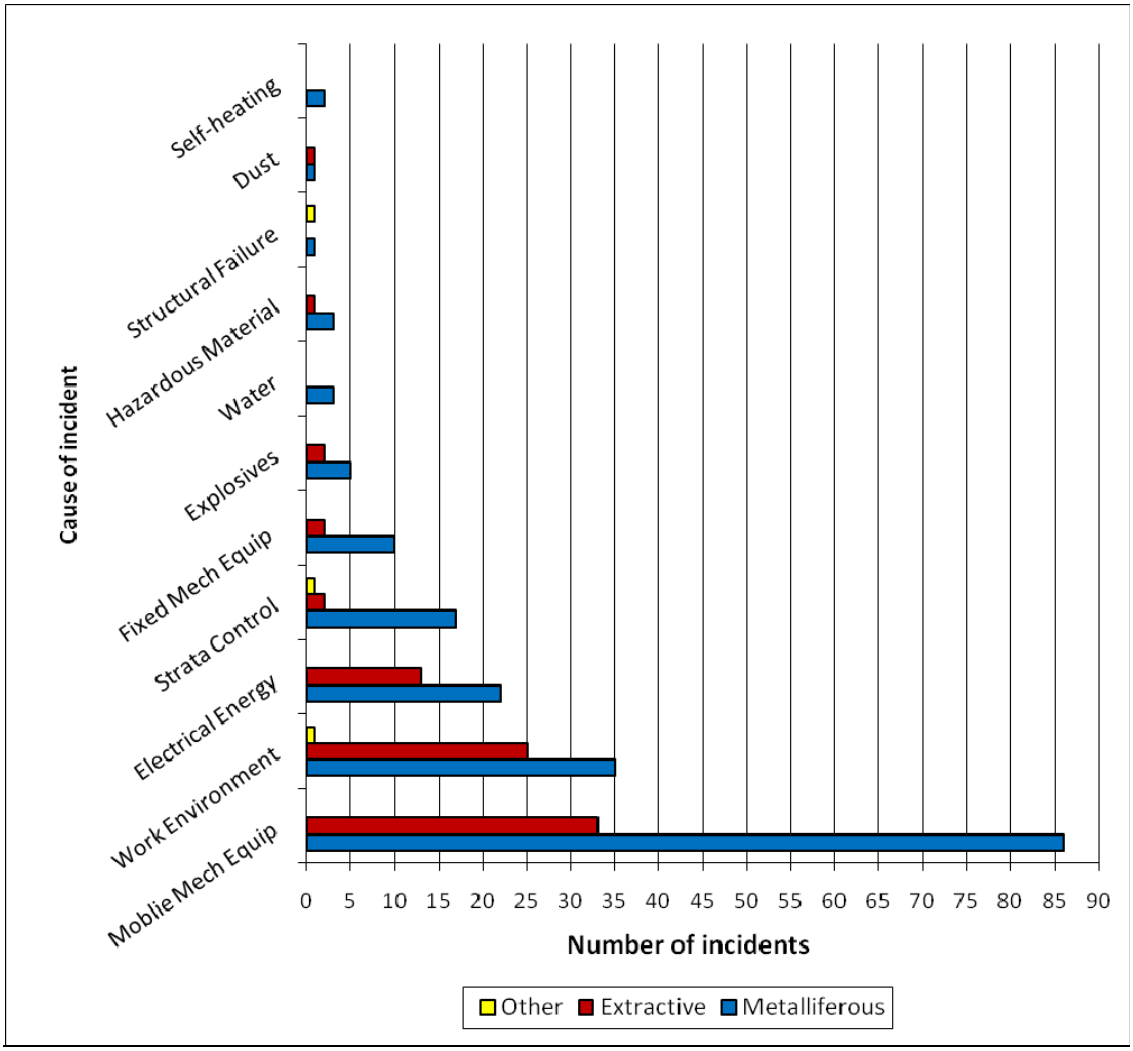
The year 2009-10 was the first full reporting year under the MHS legislation. The number of metalliferous and extractive incidents in 2009-10 was 23% higher than the average notified for the past five years (2003-04 to 2007-08) under the previous legislation. This has been attributed to more inclusive reporting requirements under the new MHS legislation. [13]

Incidents and events recorded in the COMET mine safety database are further classified according to event sub-type. The event sub-type identifies the general hazard area related to an incident or event. This classification can give an indication of the source of hazards causing injury in mining workplaces.

As shown in Graph 1.3, COMET data for 2008 to 2010 shows that overall the most commonly recorded event sub-type for metalliferous and extractive operations was related to mobile mechanical equipment (86 and 33 incidents respectively), followed by work environment (35 and 25 incidents respectively), electrical energy (22 and 13 respectively). Metalliferous operations also recorded 17 incidents related to strata control, compared to three for extractives. This may reflect the greater number of underground and larger open cut operations in the metalliferous sector compared to the extractive sector. Operations classified as 'other' recorded lower numbers of incidents related to electrical energy, strata control and structural failure. [14]

[10] I&I NSW, *NSW Mine Safety Performance Report 2009-10*, page 16.
[11] I&I NSW, *NSW Mine Safety Performance Report 2009-10*, Appendix A at pages 94 to 105.
[12] I&I NSW *NSW Mine Safety Performance Report 2009-10*, Figure 24 at page 16.
[13] I&I NSW, *NSW Mine Safety Performance Report 2009-10*, page 1.
[14] I&I NSW, *NSW Mine Safety Performance Report 2009-10*, pages 19, 21 and 22.

Graph 1.5: The most frequently recorded incidents by event sub-type and operation type from 2008-09 to 2009-10.



1.5 Enforcement of mine safety

The Mine Safety Operations Branch (MSOB) in I&I NSW enforces health and safety legislation at mining workplaces in NSW.

MSOB has a team of inspectors throughout NSW that carry out assessments and inspections to assess safety systems, processes and standards. There are 22 metalliferous and extractive mining inspectors based in Orange, Armidale, Maitland, Wollongong, Cobar, Broken Hill and Lightning Ridge.

Notices issued under the OHS and MHS legislation provide a range of enforcement powers to MSOB inspectors. Depending on the circumstances, the OHS Act allows for an inspector to issue the following:

- Notices to obtain information, documents and evidence (section 62);
- Notices to take, dismantle and keep plant, substances and other things believed to have been used in an offence under the OHS legislation (sections 60 and 70-75);
- Investigation notices to facilitate the exercise of the inspectors powers (section 89);

- Improvement notices to remedy a contravention of the OHS legislation (section 91);
- Prohibition notices to prohibit an activity where there is an immediate risk to the health and safety of any person (section 93).

Of the OHS Act notices issued to metalliferous, extractive and 'other' mining operations, improvement notices under section 91are the most frequently issued by MSOB inspectors. As shown in Table 1.2 below, 158 notices have been issued under section 91 of the OHS Act since 2008-09. The vast majority of these (155) were issued to extractive operations. This is compared to 44 notices issued under section 93 of the MHS Act, two issued under section 89 and four issued under section 62 of the MHS Act. The majority of these notices were issued to extractive operations.

The MHS legislation also provides certain powers to issue notices. Under section 131 of the Act, an inspector must advise the most senior person in the management structure of the mine who is at work of any information or practice that in the inspector's opinion may be relevant to the continued safe operation of the mine or the health, safety and welfare of people at work at the mine. Consistent with the position of 'advice' on the lower end of the enforcement hierarchy, advice notices issued under section 131 of the MHS Act are the most frequently issued of all notices, with 886 issued since the MHS legislation commenced in September 2008. Most of these were issued in relation to extractive operations (see Table 1.2).

Under clause 158 of the MHS Regulation, the Chief Inspector has the power to impose prohibitions and restrictions, require that the operator carry out certain works, or direct evacuation or closure of a mine. This power has been delegated to inspectors. In summary, an inspector may issue a notice under clause 158 where the inspector forms the opinion that a mine or anything in connection with the control or management of a mine is, or is liable shortly to become, dangerous to the health and safety of persons employed at the mine. As indicated in Table 1.2 below, 44 of these notices have been issued since the MHS Regulation commenced in 2008. Again, the majority of these have been issued in relation to extractive operations.

Table 1.2: Mine Safety Operations Branch enforcement notices summary for mining operations.[15]

NOTICES ISSUED	Cl 158 MHS Reg	s 131 MHS Act	s 62 OHS Act	s 89 OHS Act	s 91 OHS Act	s 93 OHS Act
2008-09[16]	**15**	**329**	**-**	**2**	**73**	**19**
- Metalliferous	4	28	-	2	2	2
- Extractive	11	297	-	-	70	15
- Other	-	4	-	-	1	2
2009-10	**29**	**557**	**4**	**-**	**85**	**25**
-Metalliferous	4	66	-	-	-	1
-Extractive	25	484	4	-	85	24
-Other	-	7	-	-	-	-
TOTAL	**44**	**886**	**4**	**2**	**158**	**44**

[15]Data from Industry & Investment NSW, *NSW Mine Safety Performance Report 2009-10*, page 82.
[16] The MHS legislation commenced on 1 September 2008.

2. Audit Objectives, Scope and Method

2.1 Audit objectives and scope

This audit program was conducted by MSOB in response to recommendations made in the Wran Report.

The objectives of the audit program were to:

a. assess whether the system for managing health and safety at mining operations in NSW includes all matters, plans and procedures required under relevant legislation;
b. provide feedback to industry on the extent to which the systems for managing health and safety at mining operations in NSW comply with the relevant legislation;
c. identify industry-wide problems and issues in achieving compliance with the relevant legislative provisions and suggest strategies to address them; and
d. establish baseline data on industry compliance with the legislative provisions to enable trend analysis in future compliance audit programs.

As required in the 2009-10 MSOB Business Plan, assessment of both MSMP and the CMP were included in the audit program.

The MSOB Business Plan also required a total of 600 assessments to be conducted in the metalliferous and extractive mining industry, with 20% (120) of these to be conducted against the documented audit standard. Both MSMP and CMP audits were conducted at most underground metalliferous mines and large open cut mines. For smaller mines, officers were asked to identify operations to provide a cross section of mine type, size and maturity. To 14 December 2010, results from 321 MSMP audits and 80 CMP audits had been entered into COMET conducted as part of the audit program.

2.2 Audit method

The audit process was designed to be consistent with the standard auditing methods as described in *Guidelines for quality and/or environmental management systems auditing AS/NZS ISO 19011:2003.* The audits assessed the compliance of MSMP and CMP documents with the requirements in the MHS legislation.

MSOB inspectors and mine safety officers carrying out audits for the program completed a safety auditor course that meets the requirements for OHS Auditor Certification with the Quality Society of Australasia.

Mines to be audited were notified of the audit program. This included:

- information about the objectives and scope of the audit program;
- an outline of the audit assessment procedure;
- a copy of the audit assessment worksheet setting out audit criteria;
- an indication of documents to be made available and the range of persons to be interviewed during the audit assessment;
- a request for a contact person at the operation to assist in coordination of the assessment; and
- contact details for the audit assessment officer.

The audits consisted of a desktop assessment of documents that looked at the extent to which the required legislative elements were addressed and integrated into the documented MSMP and CMP used at the mine.

MSOB inspectors and mine safety officers made an appointment with the nominated site representative to conduct the audit at site. At the time of audit, the MSOB inspector or mine safety officer interviewed the nominated site representative and reviewed relevant documentation against the audit criteria in the assessment worksheet. Scores and comments for each criterion were recorded on an assessment worksheet. The following scoring system was used for the audits.

1-2	**Just starting**	Evidence of some procedures. Evidence of implementation of procedures may be lacking. Significant actions identified to achieve legislative compliance.
3-4	**Progressing**	Plan exists and is part prepared. Some evidence that procedures effectively used but ongoing work required to achieve compliance.
5	**Done**	Plan fully documented, current and comprehensive, with effective document control and review. Evidence exists that procedures fully implemented.
0	**Not Applicable**	Audit criterion does not apply to the mine.

On completion of the audit interview, the MSOB inspector or mine safety officer provided feedback to the mine representative. Feedback was in the form of an audit checklist that included agreed notes or actions, and/or a separate report of results. Follow up inspections were conducted at selected mines.

The scores from the assessment worksheets were entered on the COMET database. Score range, average and frequency were identified and percentage compliance ratings calculated. Scores reflecting the 'non-applicable' rating and operations without updated profiles in the COMET database were excluded from the calculations. Comparisons were made between regions, operation types, and the type of audit.

For reporting purposes, the state was divided into the following seven regions:

- ***Central West region*** covers mines around Orange, Parkes and West Wyalong, north to around Cobar and south to the Victorian border.

- ***Cobar*** is part of the Central West inspectorate but is reported separately in this report due to the number of large metalliferous mines in the area.

- ***Hunter region*** covers mines in the Hunter Valley up to Gloucester and Taree and down to the Central Coast.

- ***Northern region*** covers areas north of the Hunter Valley, including mines around Gunnedah, Narrabri, Boggabri and Armidale, and west along the Queensland border.

- ***South East region*** covers the greater Sydney area and the coastal region south to the Victorian border and west to around Canberra.

- ***Lightning Ridge*** is part of the South East inspectorate area but is reported separately for the purposes of the audit program due to the remote location and predominance of opal mining operations in the area.

- ***Western region*** covers areas west of West Wyalong to the border including around Broken Hill, south to the Victorian border and north to Wilcannia.

3. Background

3.1 Mine safety management plans

The Mine Safety Management Plan (MSMP) is essentially a statement of how the health and safety of the people at work at the mine, or people directly affected by the mine, will be protected. A mine operator is required to prepare a MSMP prior to any work directly related to mining being carried out (sections 27 and 28 of the MHS Act). The operator must ensure that any work at the mine is done in compliance with the MSMP, including work undertaken by contractors (section 29).

Section 30 of the MHS Act provides that a MSMP must include:

- reference to any regulations, systems, programs, plans and procedures developed and implemented under the MHS Act that apply to the mine;
- reference to any codes, standards or guidelines that apply to the mine;
- the basis for the identification of hazards, and assessment of risks by the operator;
- development of controls of those risks;
- implementation of those controls;
- the document that sets out the management structure required under Subdivision 3;
- the contractor management plan required under Subdivision 4;
- the emergency plan required under Subdivision 5; and
- any other matter required by the regulations.

The MHS Regulation prescribes the following additional contents of a MSMP (see clause 14):

- an OHS policy that includes OHS objectives for the mine;
- the arrangements for the safe use of plant pursuant to the OHS legislation, including the acquisition, commissioning, operation and maintenance of fit-for-purpose plant;
- the arrangements for hazard identification, OHS risk assessment and risk control at the mine so as to meet the requirements of the OHS legislation, including the conduct of regular site inspections;
- the arrangements for appropriate instruction, training and provision of information for persons so as to meet the requirements of the OHS legislation;
- the arrangements for supervision at the mine;

- the arrangements for communication at the mine, including:

  (i) the exchange of information between shifts regarding hazards that may affect the health and safety of persons at the mine, and
  (ii) a system that enables effective communication between supervisors and other persons for the purpose of receiving instructions in the event of imminent risk, and
  (iii) a system that provides for the recording of the name of any person who is underground at a mine and their probable location from time to time, and
  (iv) a voice communication system from the surface parts of a mine to critical infrastructure locations in the underground parts at the mine;

- any site safety rules, including the detail of arrangements for ensuring that all persons at the mine are informed of the rules;

- the arrangements for document control and record keeping, including:

  (i) the use, distribution and control of documents required to be kept by legislation, and
  (ii) the instruction of persons in the use, distribution and control of such documents.

3.2 MSMP audit

The audit was designed to test the compliance with the overarching MSMP requirements and excluded the more specific requirements for CMP which were dealt with in a separate audit.

The audit criteria covered the main MSMP components as follows:

1. MSMP planning
2. OHS policy
3. Management structure
4. OHS documentation
5. Consultation and communication
6. Assessment of hazards
7. Identifying risk
8. Reporting of hazards and workplace inspections
9. Safe Work Method Statements (SWMS)
10. Job Safety Analysis (JSA)
11. Emergency preparedness
12. Maintenance programs
13. Accident and incident reporting
14. Contractor management
15. Work environment
16. Training and development
17. Fitness for work

The 17 audit criteria included 69 more detailed questions, each covering an element of the MSMP requirements.

As at 14 December 2010, COMET showed a total of 321 mines with updated MSMP audit profiles. These mines were included in the audit analysis. Table 3.1 below shows that the majority of these mines were extractive operations. Note that 21 MSMP audits of metalliferous operations were entered into COMET at the time of analysis, out of 141 metalliferous operations with a COMET profile (ie) 14.8% of metalliferous operations returned audit results. This is compared to 298 audited extractive operations out of 1485 with a COMET profile (ie) 20.1% of extractive operations.

One operation was audited in Lightning Ridge and one operation was classified as 'other'.

Table 3.1: Number of mines included in MSMP audit analysis by region and type of operation.

Region	Central West	Cobar	Hunter	Lightning Ridge	Northern	South East	Western	TOTAL
Metalliferous	9	5	0	0	0	0	7	21
Extractives	77	0	118	1	22	73	8	298
Others	1	0	0	0	0	0	0	1
TOTAL	**87**	**5**	**118**	**1**	**22**	**73**	**15**	**321**

3.3 Contractor management plans

The MSMP must include a contractor management plan (CMP) as required in Subdivision 4 of Division 2 in Part 5 of the MHS Act (section 30(3)(b)). That subdivision requires an operator of a mine where contractors will be used to prepare a CMP stating how the risks arising from use of contractors at the mine will be managed (section 37 of the MHS Act). Prior to any work being carried out by a contractor, the operator must ensure that the contractor is familiar with the MSMP and that the contractor's safety arrangements are consistent with it (section 39 of the MHS Act).

The CMP must include (section 38 of the MHS Act and clause 29 of the MHS Regulation):

- assessment of contractor health and safety policies, procedures, competence of persons, OHS performance and the extent to which plant is fit-for-purpose prior to engagement;
- site induction of contractors, contractor employees and sub-contractors;
- monitoring of contractor compliance with site health and safety requirements, including the legislated requirements;
- communication arrangements between the operator and contractors;
- appropriate consultation with the contractor's employees.

Subdivision 4 of Division 2 in Part 5 of the MHS Act also sets out other duties that an employer owes to a contractor. These include ensuring that:

- every contractor who works at the mine is directed to comply with legislated OHS requirements;
- the activities of the contractor are monitored to determine compliance with the operator's MSMP or the contractor's safety management plan and with the legislated OHS requirements;
- the contractor is directed to take action immediately if not complying;
- if a risk to the health or safety of a person arises because of such non-compliance, the contractor is directed to stop work immediately and to not resume work until the requirements are complied with, unless an immediate cessation of work is likely to increase the risk to health and safety, in which event the contractor must be directed to stop work as soon as it is safe to do so;

- the contractor and the contractor's employees receive OHS induction training;
- the contractor is provided with details of any relevant changes made to the MSMP for the mine.

Contractors have reciprocal duties under the MHS Act, such as complying with the MSMP, preparing a SWMS that includes prescribed content, providing that SWMS to an operator and subcontractors and ensuring that work is done in accordance with the SWMS (as covered under Part 5, Division 6 of the MHS Act).

The duties under the MHS legislation in relation to contractors only apply in relation to contractors engaged in mining or construction work at a mine and not other contractors involved in work such as office equipment service, office cleaning and catering (section 169 of the MHS Act and clauses 30 and 31 of the MHS Regulation).

Note that nine CMP audits of metalliferous operations were entered into COMET at the time of analysis, out of 141 metalliferous operations with a COMET profile (ie) 6.4% of metalliferous operations returned audit results. This is compared to 71 audited extractive operations out of 1485 with a COMET profile (ie) 4.8% of extractive operations.

3.4 CMP audit

The CMP audit consisted of eight criteria covering:

1. The existence of a CMP document as required by the MHS legislation
2. The content of the CMP
3. Pre-engagement assessment
4. Consultation and communication
5. Contractor safety management plans (CSMP)
6. Safe work method statements (SWMS)
7. Site induction
8. Monitoring

A total of 80 CMP audit profiles were updated on COMET as at 8 December 2010. These audit results were included in the analysis.

As for the MSMP audits, the majority of mines audited for the CMP were extractive operations. Most of these were in the South East Region. One operation was audited in the Western Region and two in Northern. No mines classified as 'other' were included in the analysis (Table 3.2).

Table 3.2: Number of mines included in CMP audit analysis by region and type of operation.

Region	Central West	Cobar	Hunter	Lightning Ridge	Northern	South East	Western	TOTAL
Metalliferous	3	5	0	0	0	1	0	9
Extractives	7	0	8	0	2	53	1	71
Others	0	0	0	0	0	0	0	0
TOTAL	**10**	**5**	**8**	**0**	**2**	**54**	**1**	**80**

4. Findings for MSMP Audit

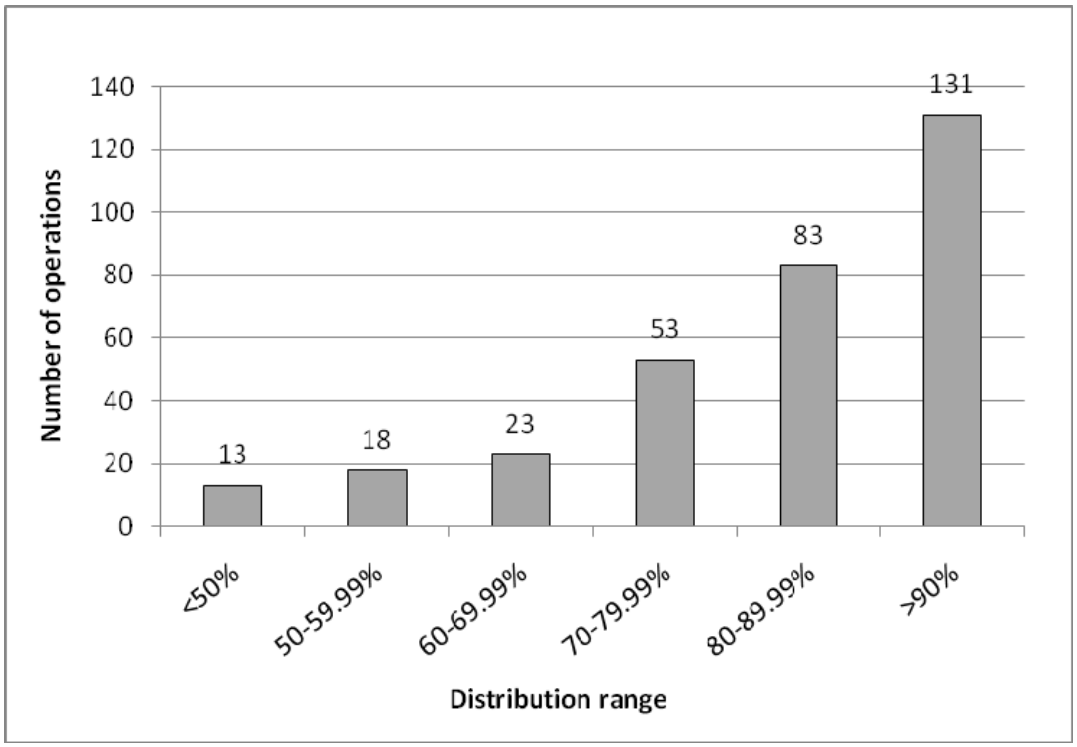
4.1 Compliance by operation

Overall

The overall compliance for the MSMP audits across the 321 operations showing updated audit profiles ranged from 23.77% for a sand mine in the Central West to 99.42% for both a quarry and a sand mine in the South East region. This compares to an average of 82.03% across all operations.

The highest frequency of compliance scores for individual operations was in the over 90% distribution range (Graph 4.1). The lowest frequency was in the less than 50% range, with the distribution in a negatively skewed J-curve across the distribution ranges to the highest frequency at over 90%.

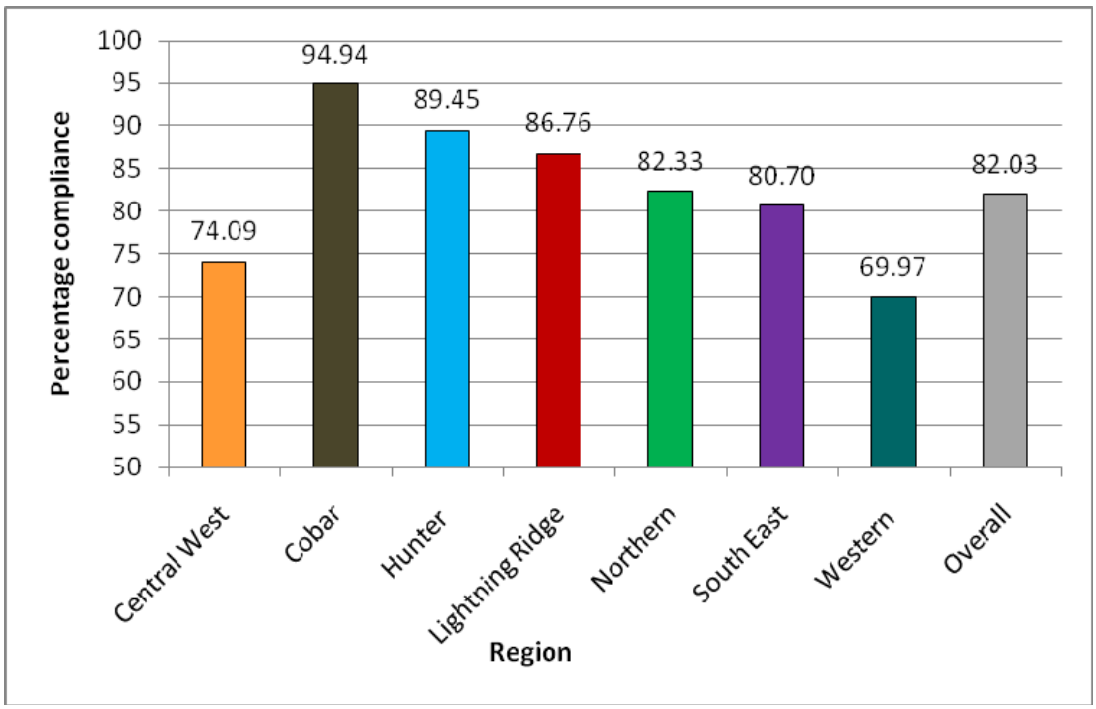
Graph 4.1: Distribution of overall average compliance scores for MSMP audit across operations.



Regions

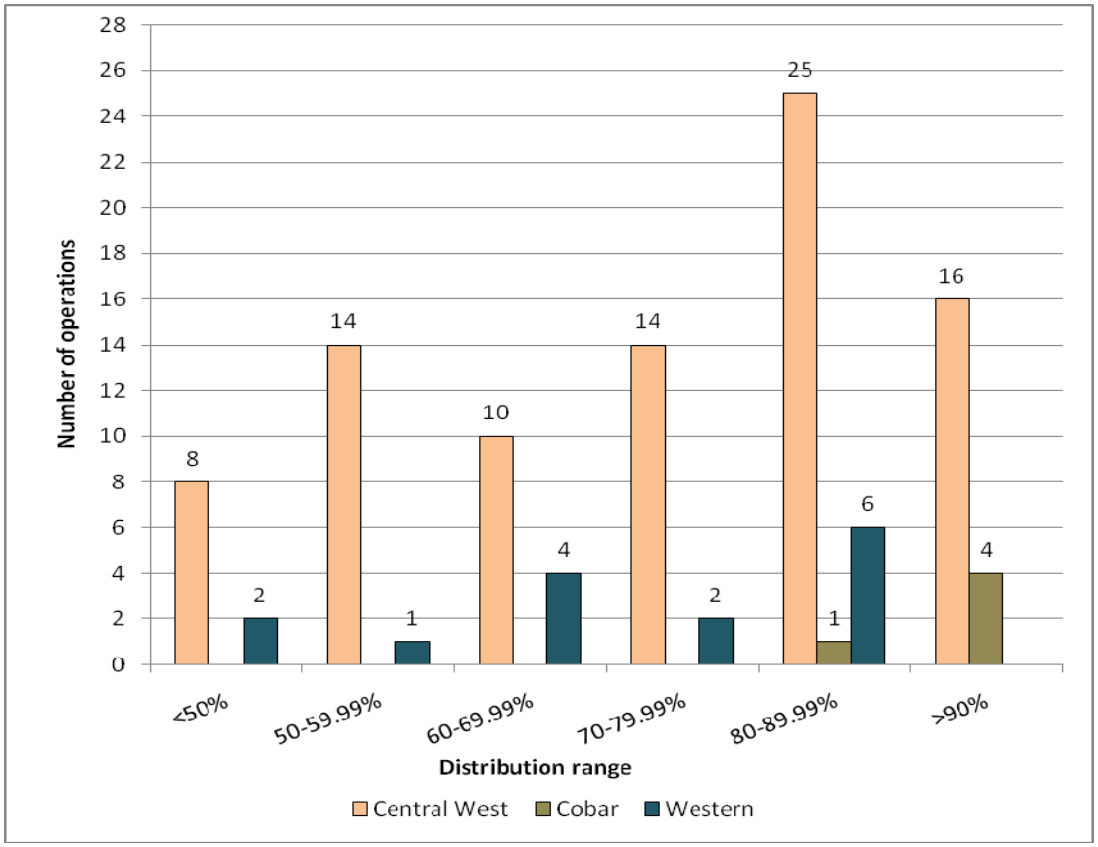
As shown in Graph 4.2 below, mines in the Cobar and Hunter regions were the most compliant with the requirements assessed in the MSMP audit, scoring 94.94% and 89.45% respectively. The single operation audited in Lightning Ridge was next compliant, followed by operations in the Northern (82.33%) and South East (80.70%) regions. Operations in the Western region were the least compliant, scoring 69.97% overall. Note that all operations audited in the Cobar region were larger metalliferous mines.

Graph 4.2: Average percentage compliance with MSMP audit by region.

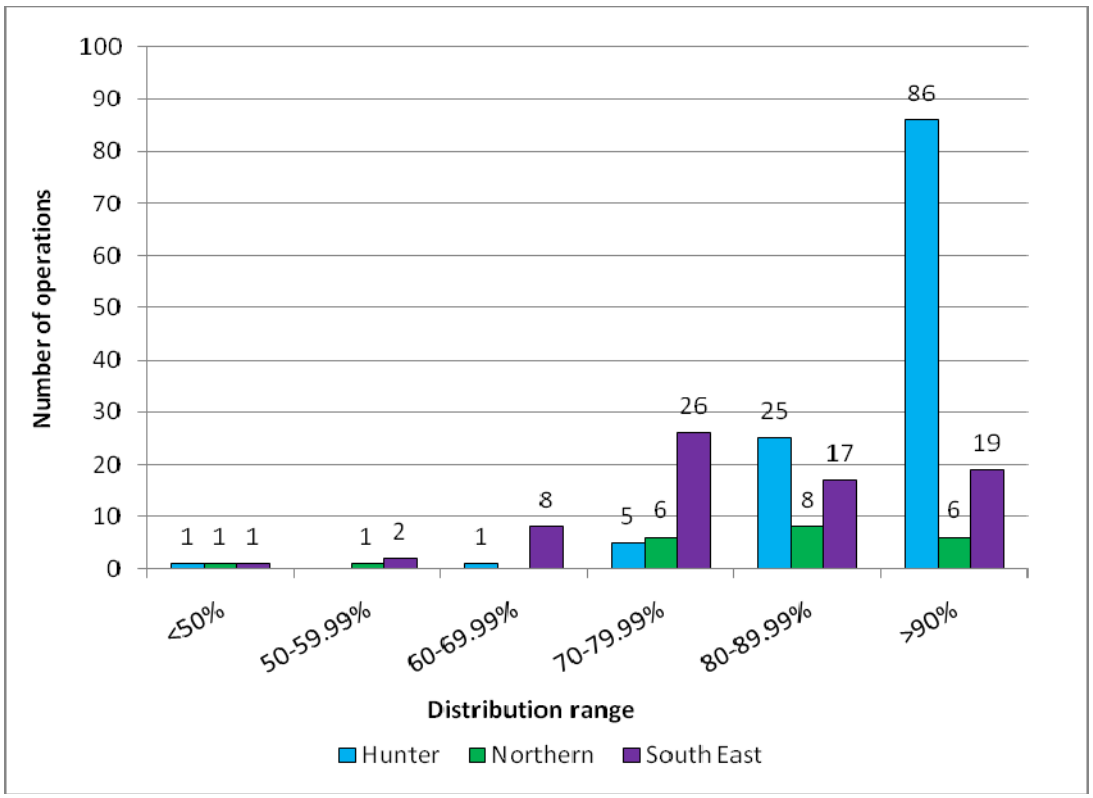


The distribution of compliance scores across the regions is shown in Graphs 4.3(a) and 4.3(b) below.

Graph 4.3(a): Distribution of percentage compliance scores for MSMP audit by region.



Graph 4.3(b): Distribution of percentage compliance scores for MSMP audit by region.



These graphs show the following:

- Central West – the highest frequency of scores for operations in this region was in the 80-89.99% distribution range (25 out of 87 operations). There were 16 operations in the over 90% compliance distribution range, followed by 14 each in the 50-59.99% and 70-79.99% distribution ranges and 10 operations in the 60-69.99% distribution range. Eight operations scored less than 50%.
- Cobar – of the five operations audited in this region, four operations scored more than 90% and one scored in the 80-89.99% range.
- Western region – the highest frequency of scores for operations in this region was six out of the total of 15 audited operations in the 80-89.99% range, with four operations in the 60-69.99% range. Two operations fell in the 70-79.99% distribution range and one in the 50-59.99% distribution range. Two operations scored less than 50%.
- Hunter region – for this region, by far the majority of operations fell in the over 90% range (86 out of 118 operations audited), with the next highest frequency in the 80-89.99% range.
- Northern region – operations in this region were comparatively evenly distributed. Eight out of the 22 audited operations scored in the 80-89.99% distribution range, followed by six each in the 70-79.99% and over 90% distribution ranges and one operation in the 50-59.99%. One operation scored less than 50%.
- South East – the highest number of operations in this region (25 out of a total of 73 operations audited) fell within the 70-79.99% distribution range, with the next highest number (19) in the over 90% range, and 17 operations in the 80-89.99% range. Eight operations fell in the 60-69.99% range and two in the 50-59.99% range. One operation scored below 50%.

Operation types

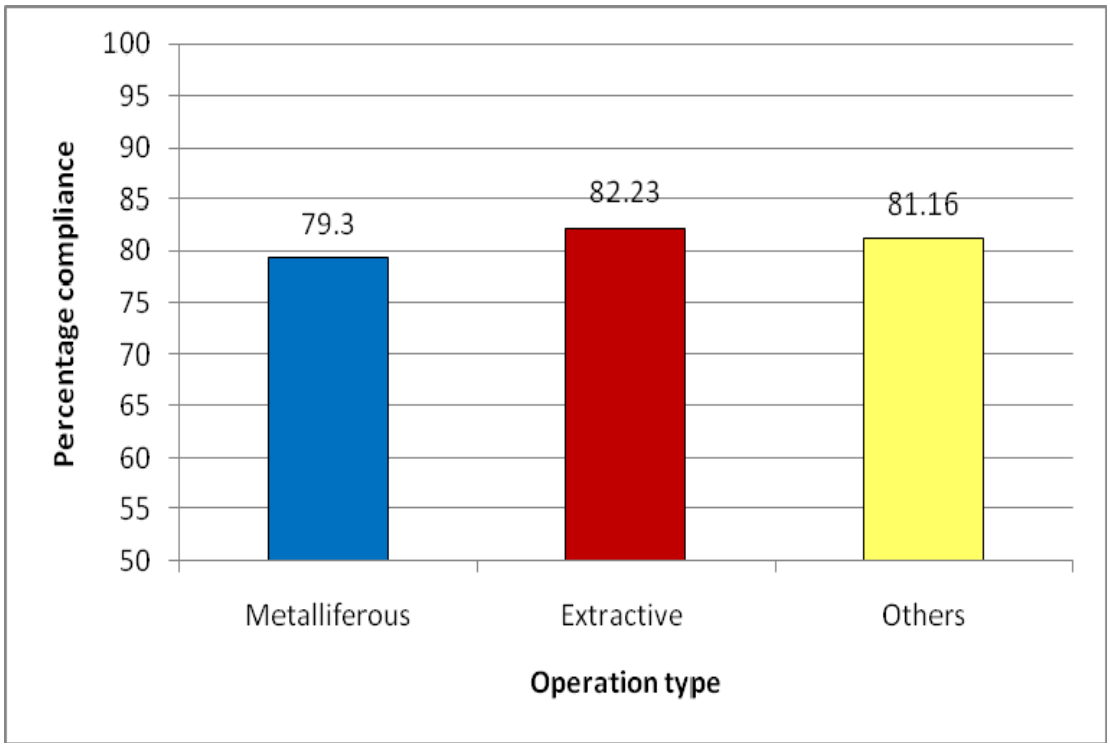
Within operation types, extractive operations were the most compliant overall, scoring an average of 82.23%. This is compared an average score of 79.30% overall for metalliferous operations. Graph 4.4). The distribution graph below (Graph 4.5) shows that extractive operations most frequently scored in the over 90% distribution range (124 out of 298 extractive operations audited in the MSMP audit program), followed by 73 in the 80-89.99% range and 52 in the 70-79.99% range. Ten operations scored less than 50%. The least compliant extractive operation scored 23.77% (a sand mine in the Central West), with a quarry and a sand mine in the South East both scoring highest with 99.42%.

The distribution graph below (Graph 4.5) shows that the majority of metalliferous operations scored in the 80-89.99% distribution range (eight out of 21 audited metalliferous operations) and over 90% range (seven operations). Three operations scored less than 50% compliance. The lowest scoring metalliferous mine scored 41.74% (Western region) and the highest 98.84% (Cobar).

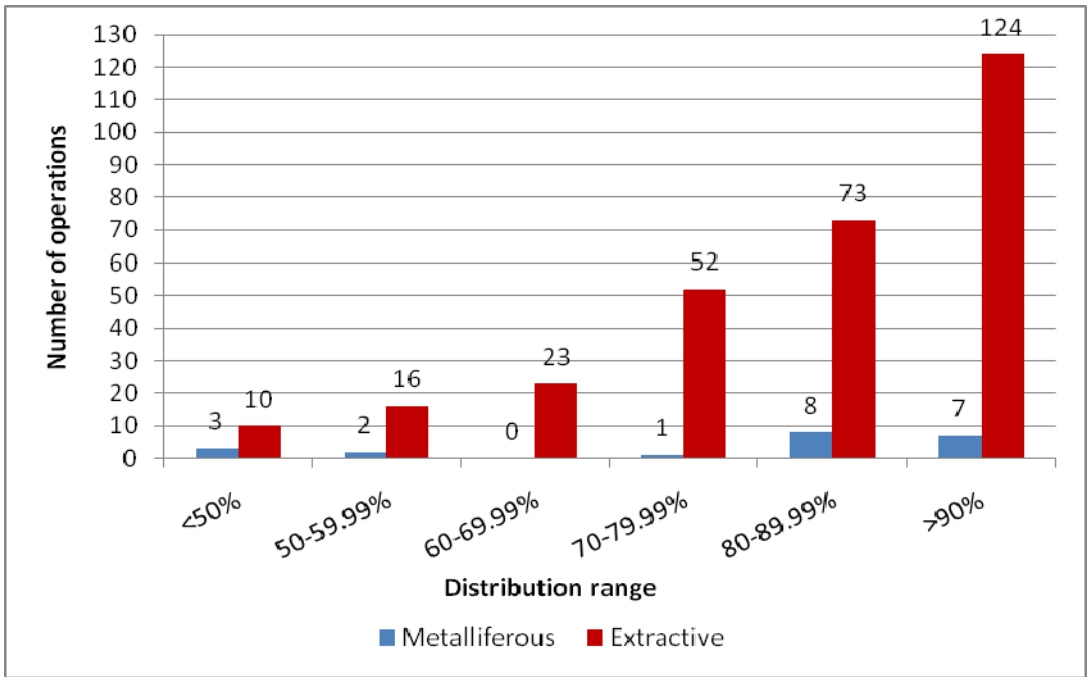
Note that 21 metalliferous audits were conducted out of 141 metalliferous mines with profiles on COMET, which represents 14.8% of metalliferous operations, compared to 291 extractive audits out of a total of 1497 extractive operations with a COMET profile, which represents 20.1%.

One operation classified as 'other' was reported in COMET as having MSMP audit results. As shown in Graph 4.4 below, that operation scored 81.16%. This result has not been included in Graph 4.5, representing distribution of scores of individual operations by operation type.

Graph 4.4: Average compliance with the MSMP audit by operation type.



Graph 4.5: Distribution of average MSMP audit compliance scores across operations by operation type.

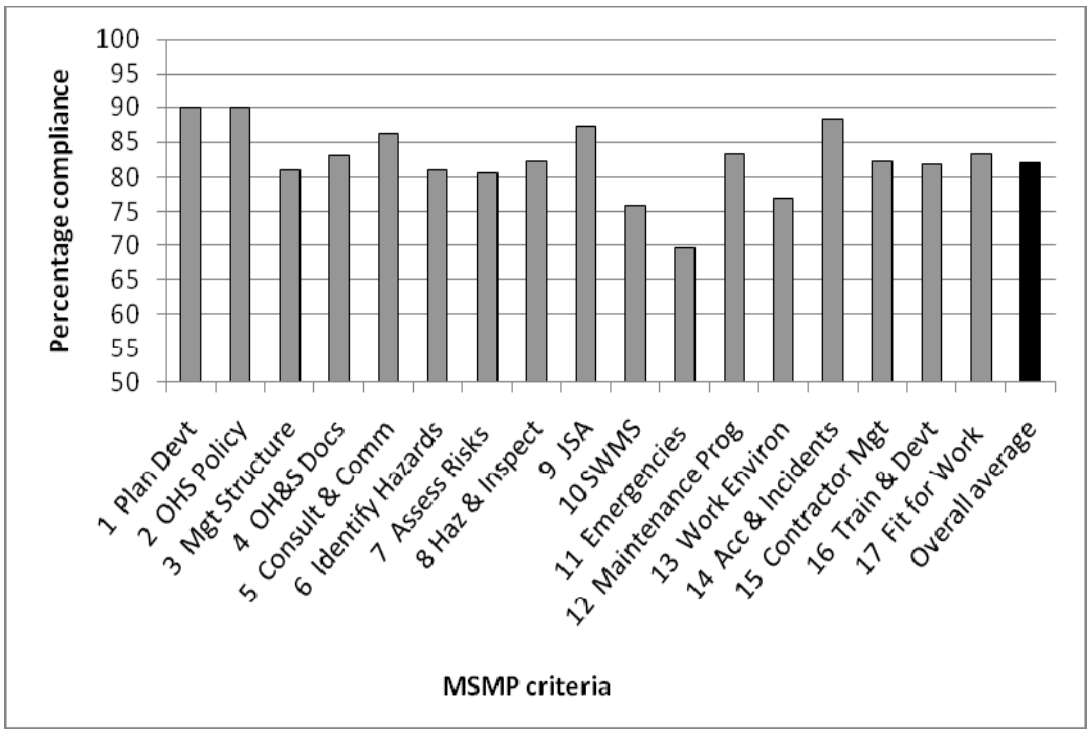


4.2 Compliance by criteria

Overall

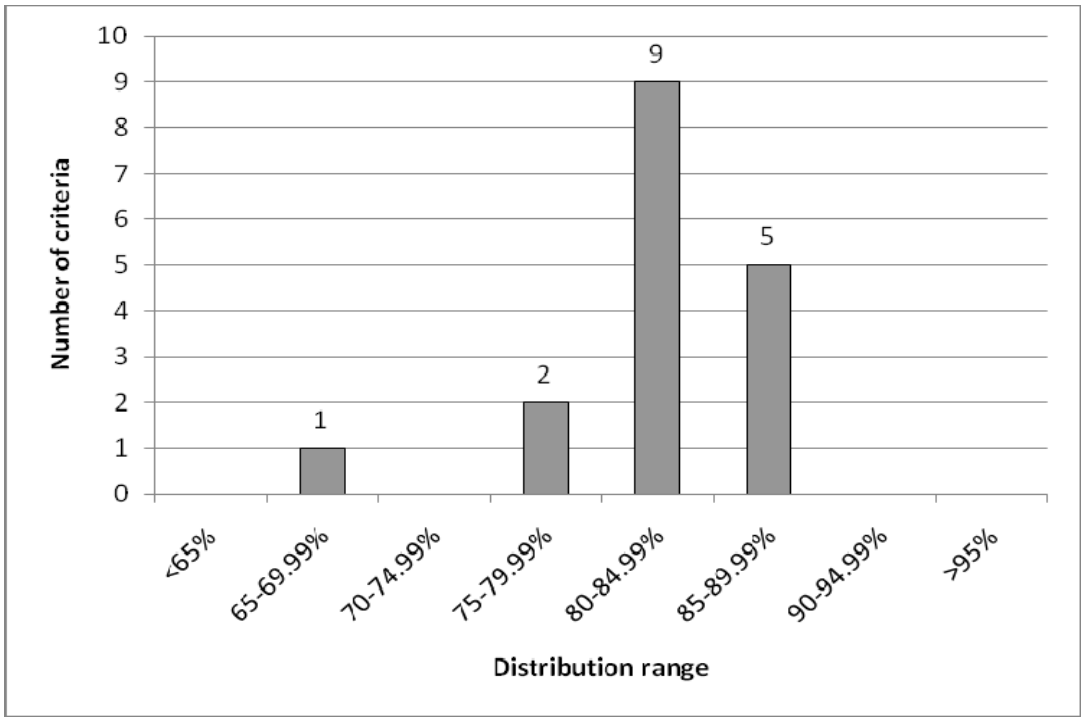
Graph 4.6 below shows that the highest overall average score for a MSMP audit criterion was 89.99% for criterion 1 (CMP development), followed by 89.82% for criterion 2 (safety and health policy) and 88.37% for criterion 14 (reporting accidents and incidents). The lowest overall average score was 69.69% for criterion 11 (emergency preparedness).

Graph 4.6: Average compliance scores for MSMP audit criteria.



The highest frequency of overall average scores for MSMP criteria across all operations was in the 80-84.99% distribution range (nine criteria) followed by the 85-89.99% range (five criteria) and the 75-79.99% range (two criteria). One criterion scored in the 65-69.99% range, with none under 69% (Graph 4.7).

Graph 4.7: Distribution of average compliance scores for MSMP audit criteria.



Some of the criteria showed a large range of scores across the sub-questions. Of note are:

- *Management structure (criterion 3)*

  The overall average compliance score for this criterion was 80.94%. However, the highest score for a sub-question was 91.25% for sub-question 3.2 (inclusion of a production manager in the management structure) and the lowest was 62.13% for sub-question 3.4 (assessing whether the management structure included persons to fill/act in vacant positions).

- *Assessing risks (criterion 7)*

  The overall average for this criterion was 80.68%, with most scores around the 85-88% mark. However, sub-question 7.2, testing whether the hazards prescribed in legislation had been assessed, scored 58.37%.

- *SWMS (criterion 10)*

  Overall, mines were most compliant with sub-question 10.2 with a score of 82.19% (using risk assessment in preparing SWMS), compared to the overall average for criterion 10 of 75.79%. The lowest score for a sub-question in this criterion was 60.27% dealing with permits for high risk work (sub-question 10.5).

- *Emergency preparedness (criterion 11)*

  As already mentioned, this was one of the least compliant areas, with an average overall score of 69.69%. There was a large range in the sub-question scores within this criterion, with a high score of 85.79% for sub-question 11.2 (emergency procedures for identified events) and a low of 46.81% for sub-question 11.5 about conducting regular emergency drills. Sub-question 11.3 scored 60.81% (integration of procedures with emergency services), 11.1 scored 74.83% (identification of foreseeable events causing injury) and sub-question 11.4 scored an average of 80.12% (identification of emergency training needs).

- *Work environment (criterion 13)*

  This criterion had an overall average of 76.91% compliance, with a range of 81.12% for sub-question 13.1(identification of hazards in the work environment and assessment of risks) to a low of 66.44% for sub-question 13.4 (records of work environment monitoring).

- *Training and development (criterion 16)*

  The highest score for a sub-question in this criterion was 90.5% for sub-question 16.3 (induction training), compared to an overall average for the criterion of 81.9%. The lowest scores were 66.88% for sub-question 16.5 (training in emergency response) and 73.73% for sub-question 16.4 (training in the use of equipment for fighting fires).

Regions

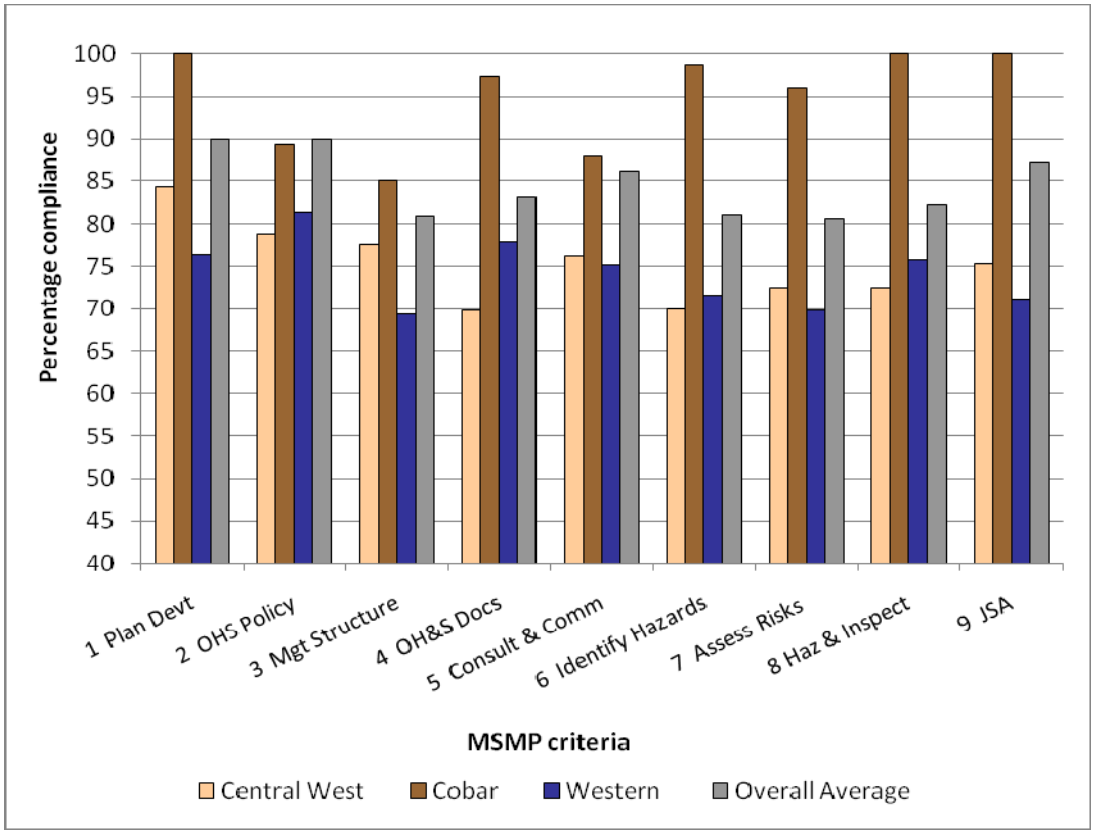
Graphs 4.8(a) and 4.8(b) show the average compliance scores for MSMP criteria by region for Central West, Cobar and Western regions.

Central West

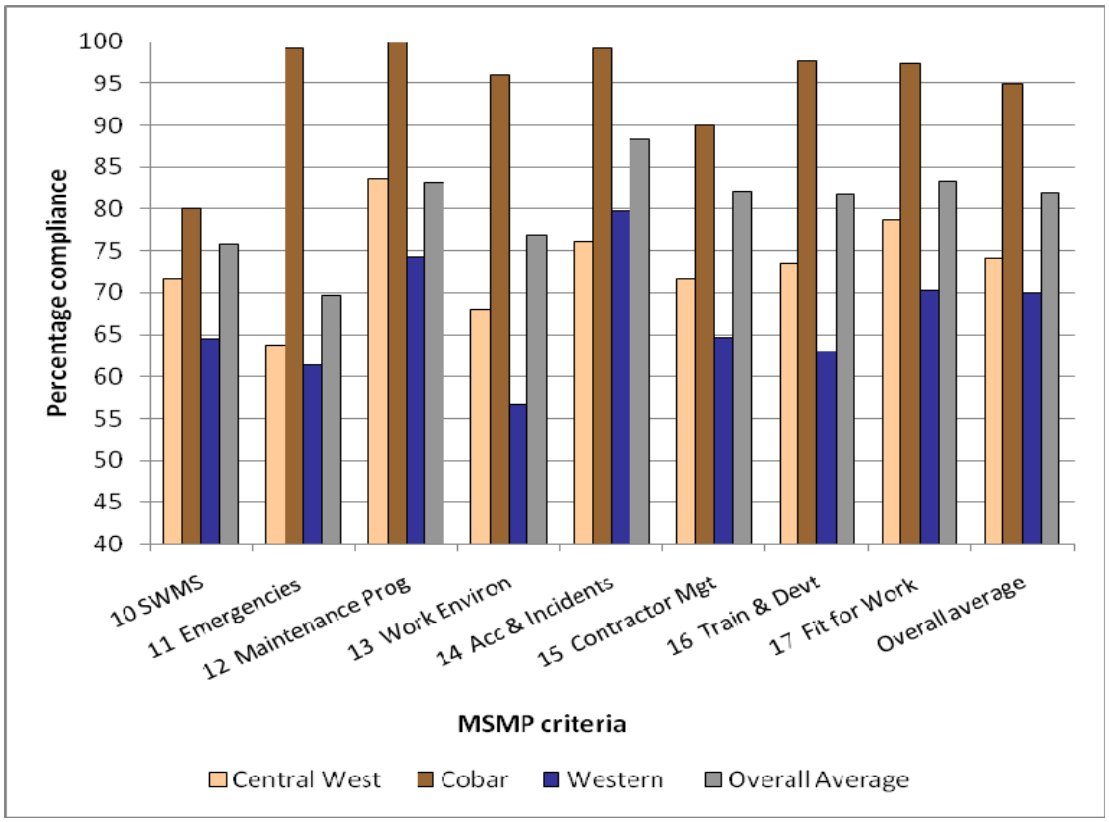
Central West mines scored 74.09% compliance overall. As shown in Graphs 4.8(a) and 4.8(b), the highest scoring criterion for mines in this region was 84.36% for plan development (criterion 1), followed by 83.64% for maintenance programs (criterion 12) and 78.76% for fitness for work (criterion 17).

The lowest scoring criterion was 63.67% for emergency preparedness (criterion 11). The average score for this criterion was lowered by sub-question 11.5, which asked about the conduct of regular emergency exercises. This sub-question scored 44.42% compliance.

Graph 4.8(a): Average percentage compliance for MSMP criteria for Central West, Cobar and Western region.

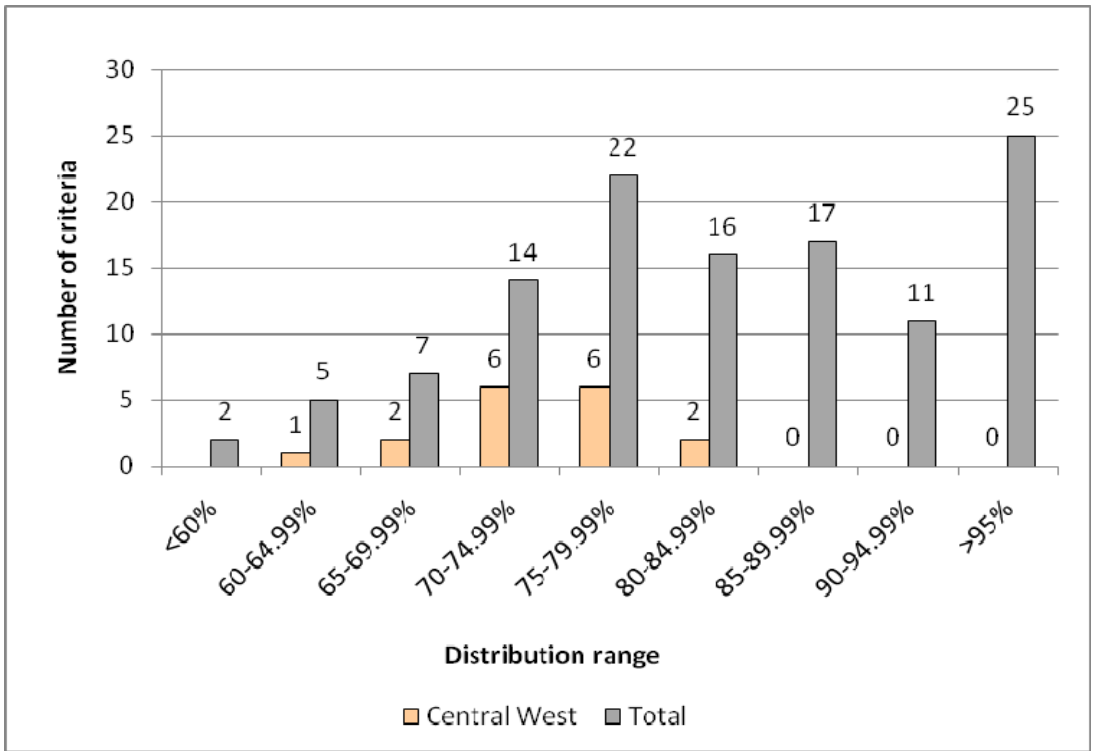


Graph 4.8(b): Average percentage compliance for MSMP criteria for Central West, Cobar and Western regions.



The highest frequency of scores for MSMP criteria for mines in the Central West region was six scores each in the 70-74.99% and 75-79.99% distribution ranges, followed by 65-69.99% and 80-5-79.99% with two scores each (Graph 4.9).

Graph 4.9: Distribution of average compliance scores for MSMP criteria for the Central West region.



Other criteria that showed a significant range across sub-questions included:

- *Safety and health policy (criterion 2)*

  Sub-questions 2.1 (about whether the policy has been written) and 2.3 (about goals of the policy) scored 85.58% and 80.93% respectively. The compliance score for sub-question 2.2 was 70.23% (about the presence of signatures from an employee representative and senior mine manager on the policy).

- *Management structure (criterion 3)*

  The highest score for a sub-question was 88% for sub-question 3.2 (inclusion of a production manager in the management structure) and the lowest was 61.88% for sub-question 3.4 (assessing whether the management structure included persons to fill/act in vacant positions).

- *Assessing risks (criterion 7)*

  Sub-question 7.2 (about risk assessment for prescribed hazards) was the least compliant sub-question with 57.65%. The other sub-questions all scored over 74%.

- *SWMS (criterion 10)*

  Scores for sub-questions within this criterion ranged from 76.47% for sub-question 10.1 (have SWMS been prepared for the tasks that involve major risks) to 61.13% for 10.5 (work permits for high-risk activities).

- *Emergency preparedness (criterion 11)*

  Scores for sub-questions within this criteria ranged from 73.26% for sub-question 11.2 (emergency response procedures) to 44.42% for 11.5 (regular emergency drills). The other sub-questions scored between 63% and 70%.

- *Work environment (criterion 13)*

  Scores for sub-questions 13.1 to 13.3 ranged from 70.23% to 72.79%. Sub-question 13.4, about records of monitoring the work environment, scored 58.84%.

- *Training and development (criterion 16)*

  Scores for sub-questions in this criterion ranged from 85.81% for first aid training (sub-question 16.1) to 62.12% for training in use of fire fighting equipment (sub-question 16.4). Sub-questions 16.5 (training in emergency response) and 16.7 (training to employees and supervisors) scored 66.98% and 67.71% respectively.

- *Fitness-for-work (criterion 17)*

  Sub-question 17.3 scored lowest with 70.93% (testing procedures to include fitness for work in toolbox talks), compared to 84.19% for the most compliant (sub-question 17.1 testing the presence of a fitness-for-work program).

Cobar

Cobar mines were the most compliant overall with a score of 94.94%. Four criteria scored 100%: plan development (criterion 1), reporting hazards and inspections (criterion 8), JSAs (criterion 9) and maintenance programs (criterion 12) (see Graphs 4.7(a) and 4.7(b)). Many sub-questions within other criteria also scored 100%.

The lowest average score for an MSMP criterion was 80% for SWMS (criterion 10). The score for criterion 10 was lowered by sub-question 10.4, which asked whether the SWMS meets the requirements under OHS legislation, codes of practice, standards and guidance material. This sub-question scored 68%. Sub-question 10.1 asking if SWMS have been prepared for the tasks that involve major risks scored 72%.

These other criteria showed a large range of scores across their sub-questions.

- *Safety and health policy (criterion 2)*

  Sub-questions 2.1 and 2.3 scored 100%, but sub-question 2.2 about the signature of employee representatives and the most senior manager on the policy document scored 68%.

- *Contractor management (criterion 15)*

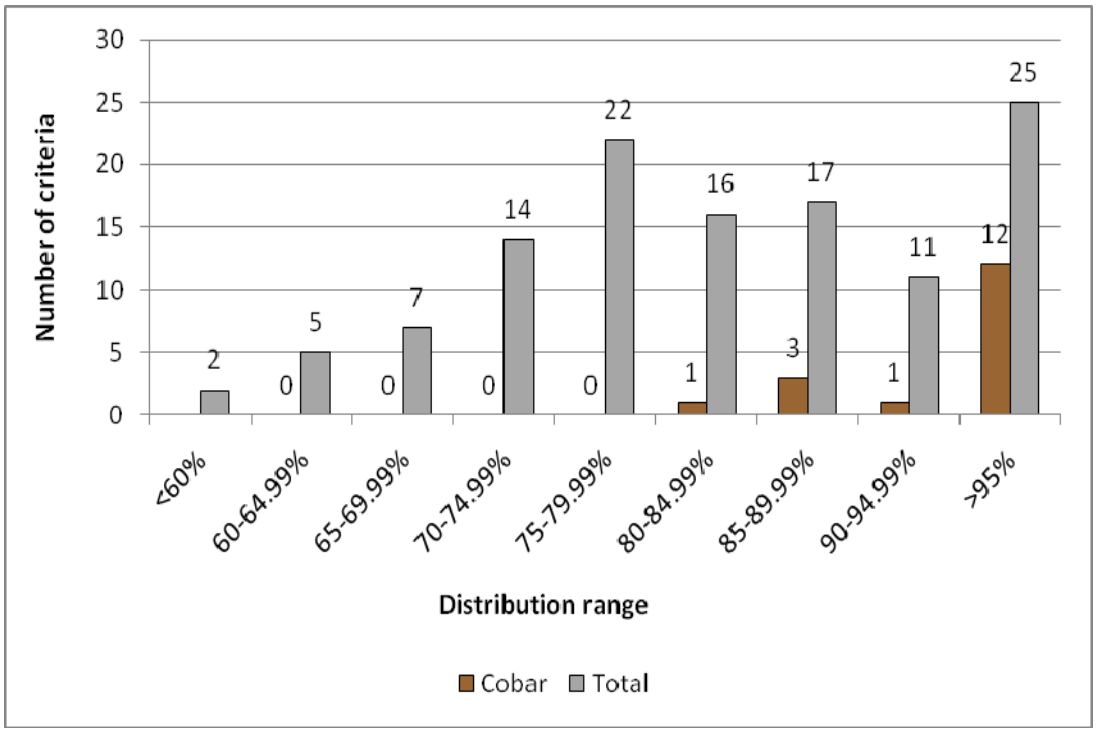
  Sub-questions 15.1 to 15.3 scored 100%. Sub-question 15.4 about development of SWMS for all contractor work scored 60%.

- *Training and development (criterion 16)*

  Sub-questions 16.1 to 16.6 all scored 100%, whereas sub-question 16.7 about training being given to supervisors and employees scored 84%.

The graph of distribution of scores below (Graph 4.10) shows that by far the greatest frequency of scores for audit criteria for Cobar mines was 12 scores in the 95-100% distribution range.

Graph 4.10: Distribution of average compliance scores for MSMP criteria for the Cobar region.



Western Region

Western Region mines were the least compliant overall with an average score of 69.97%. The least compliant areas for mines in this region included 56.57% for work environment (criterion 13), 61.33% for emergency preparedness (criterion 11), 63.05% for training and development (criterion 16), 64.53% for SWMS (criterion 10) and 64.67% for contractor management (criterion 15). Management structure (criterion 3) and assessing risks (criterion 7) scored 69.33% and 69.87% respectively.

Safety and health policy (criterion 2) scored the highest at 81.33%, followed by reporting accidents and incidents (criterion 14) with 79.73% (Graph 4.8(a) and 4.8(b)).

For mines in the Western Region, there was also a large range in the sub-question scores within many of the criteria. The criteria with significant ranges across sub-questions included:

- *Plan development (criterion 1)*

  Sub-question 1.3 about distribution of responsibilities in preparing the MSMP scored highest with 81.33% compliance, compared to a low score of 69.33% for sub-question 1.4, which was about identifying additional information that may be required for preparing a SWMS.

- *Safety and health policy (criterion 2)*

  Sub-questions 2.1 (about whether the policy has been written) and 2.3 (about goals of the policy) scored 89.33% and 88% respectively. The compliance score for sub-question 2.2 was 66.67% (about the presence of signatures from an employee representative and senior mine manager on the policy).

- *OHS documentation (criterion 4)*

  Mines in the region scored 85.33% compliance with having a written procedure for document control (sub-question 4.1), but scored 70.67% when tested about whether the procedure is kept up to date (sub-question 4.3) and 77.33% when tested about whether obsolete documents are removed from the system.

- *Assessing risks (criterion 7)*

  Western mines scored 69.87% overall for this criteria. However, sub-question 7.2 (about risk assessment for prescribed hazards) scored 54.67%. The other sub-questions all scored over 70%.

- *SWMS (criterion 10)*

  Scores for sub-questions within this criterion ranged from 73.33% to 58.67% for both 10.2 and 10.4 (testing whether risk assessment is used in SWMS and whether the SWMS meets legislation, codes of practice, guidance material and standards). Sub-question 10.3 about training in SWMS scored 60% compliance.

- *Emergency preparedness (criterion 11)*

  Scores for sub-questions within this criteria ranged from 74.67% for sub-question 11.2 (emergency response procedures) to 42.67% for 11.5 (regular emergency drills). The other sub-questions scored between 60 to 67%.

- *Contractor management (criterion 15)*

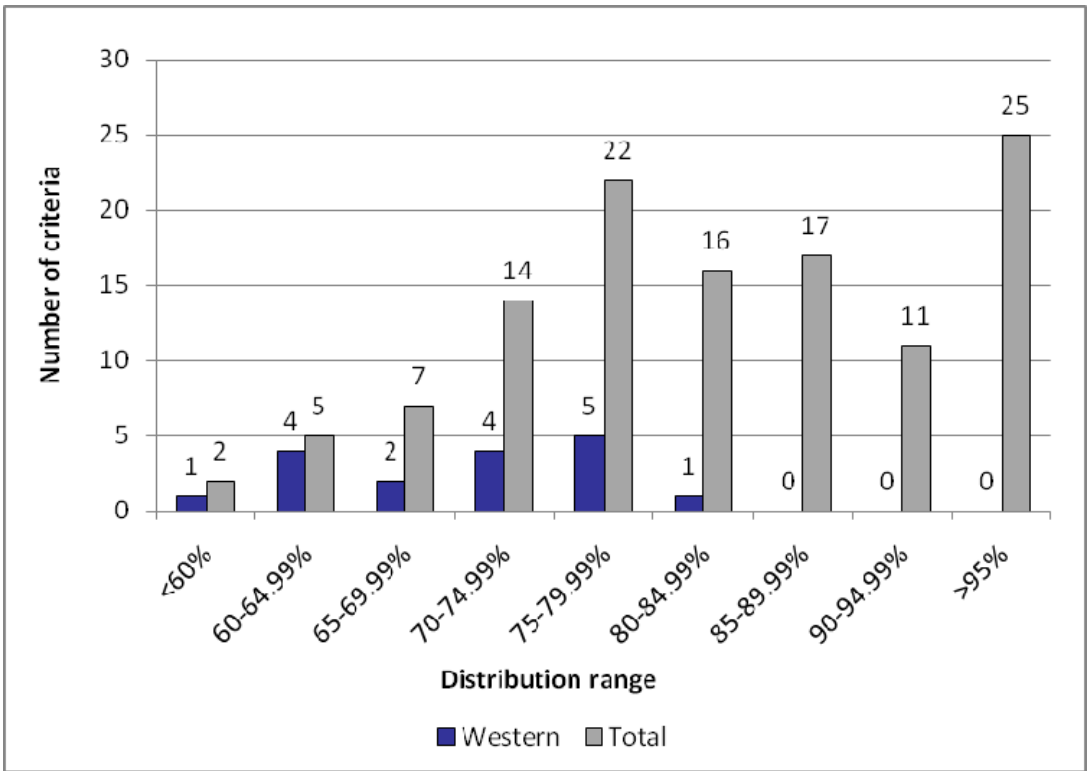
  Scores ranged from a high of 76% compliance for sub-question 15.2 (OHS induction training for contractors) to 52% for sub-question 15.4 (dealing with development of SWMS for all work carried out by contractors).

- *Training and development (criterion 16)*

  Scores for sub-questions in this criterion ranged from 74.67% for induction training of employees (sub-question 16.3) to 49.33% for training about health and safety obligations for supervisors and employees (sub-question16.7). Sub-questions 16.4 and 16.5 about training in use of fire fighting equipment and emergency response both scored 53.33%.

The scores for the MSMP audit criteria in this region most frequently fell in the 75-79.99% distribution range (five criteria), followed by 70-74.99% (four criteria) and 60-64.99% (four criteria) (Graph 4.11).

Graph 4.11: Distribution of average compliance scores for MSMP criteria for the Western region.



Graphs 4.12(a) and (b) below show the average compliance scores for MSMP criteria by region for Hunter, Lightning Ridge, Northern and South East

Hunter

Hunter region operations were the second most compliant after Cobar, scoring 89.45% overall. As shown in Graphs 4.12(a) and 4.12(b), the highest scoring criteria were criterion 1 (plan development) with 99.28%, criterion 9 (JSA) with 99.21% and 98.95% for criterion 14 (reporting accidents and incidents).

The lowest scoring criteria were emergency preparedness (criterion 11) with 69.32% compliance and 78.71% for SWMS (criterion 10). Again, the average score for criterion 11 was lowered by sub-question 5 about regular emergency exercises (42.54%), as well as sub-question 11.3 about integration of emergency procedures (44.41%).

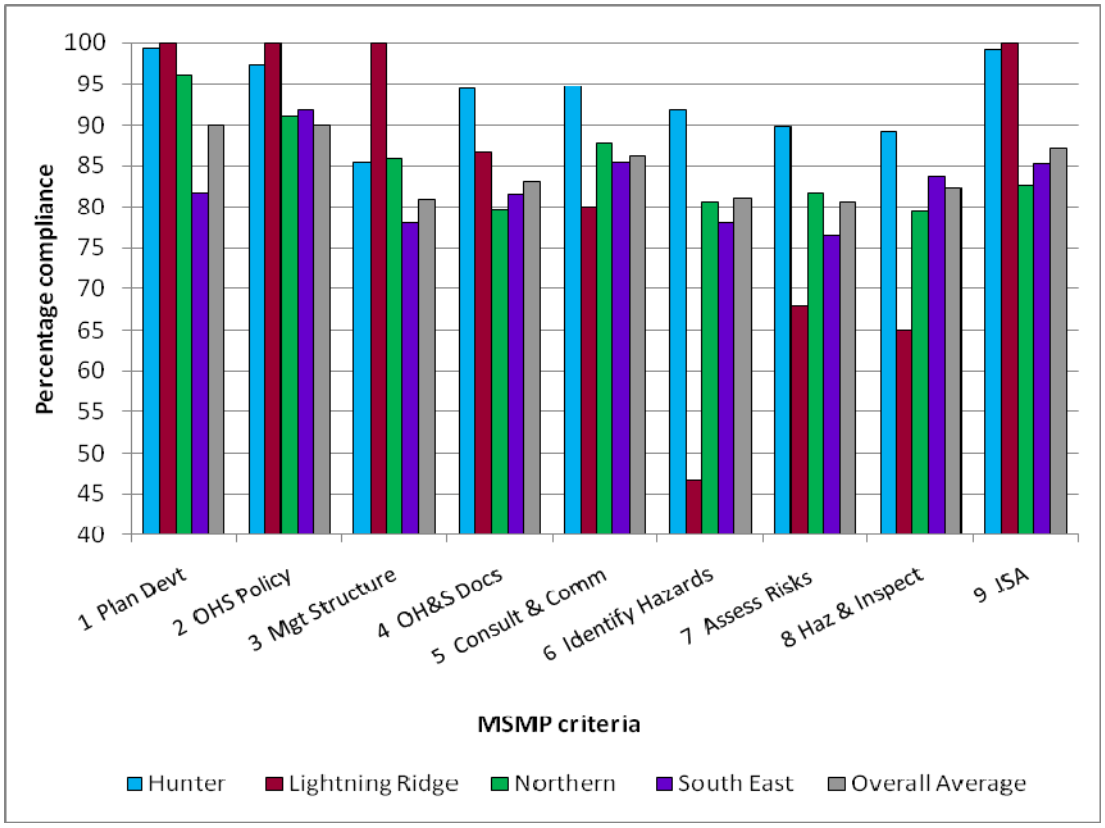
The average score for SWMS (criteria 10) was lowered by sub-question 10.5, which asked about work permits for high-risk work. This sub-question scored 49.15%.

Other criteria showing a large range across sub-questions were:

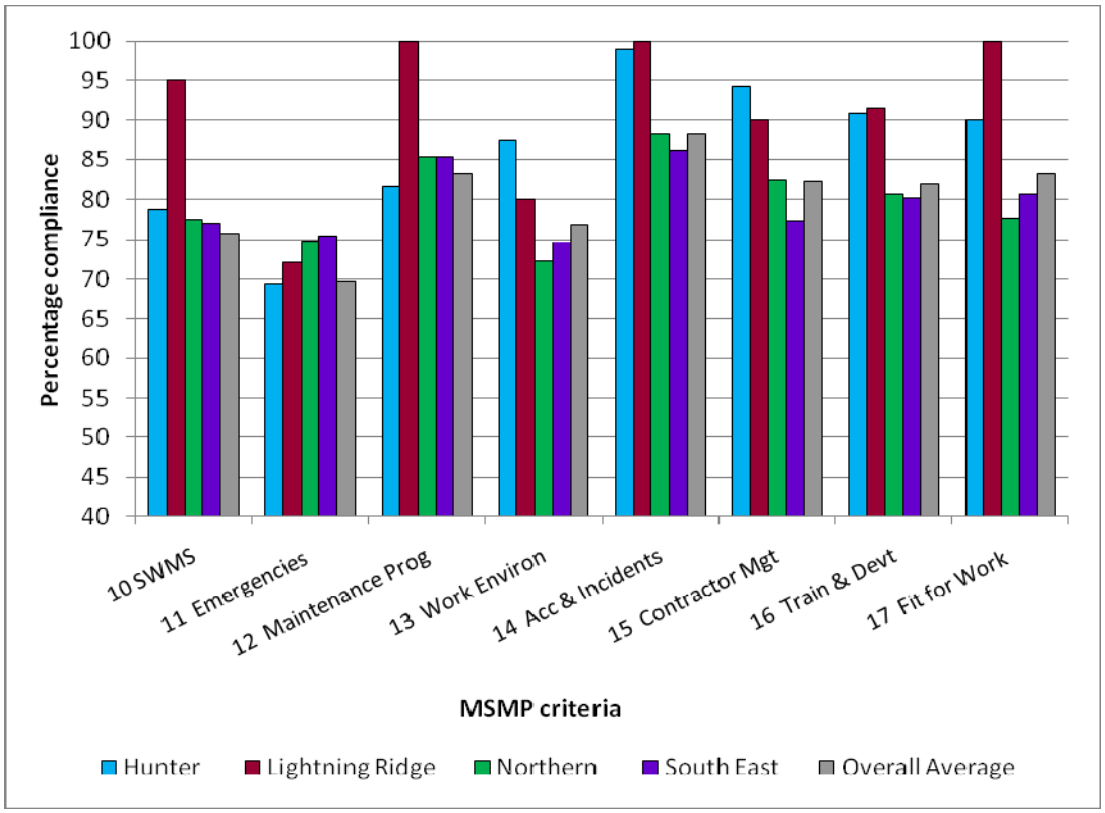
- *Management structure (criterion 3)*

  The highest score for a sub-question was 97.46% for sub-question 3.2 (inclusion of a production manager in the management structure) and the lowest was 55.76% for sub-question 3.4 (assessing whether the management structure included persons to fill/act in vacant positions).

Graph 4.12(a): Average percentage compliance for MSMP criteria for Hunter, Lightning Ridge, Northern and South East regions.



Graph 4.12(b): Average percentage compliance for MSMP criteria for Hunter, Lightning Ridge, Northern and South East regions.



- *Assessing risk (criterion 7)*

  Scores for the sub-questions within criterion 7 ranged from 57.97% for sub-question 7.2, about assessing the prescribed hazards in legislation, to 99.83% for sub-question 7.3 about employee involvement in hazard assessment. The other criteria scored over 95%.

- *Training and development (criterion 16)*

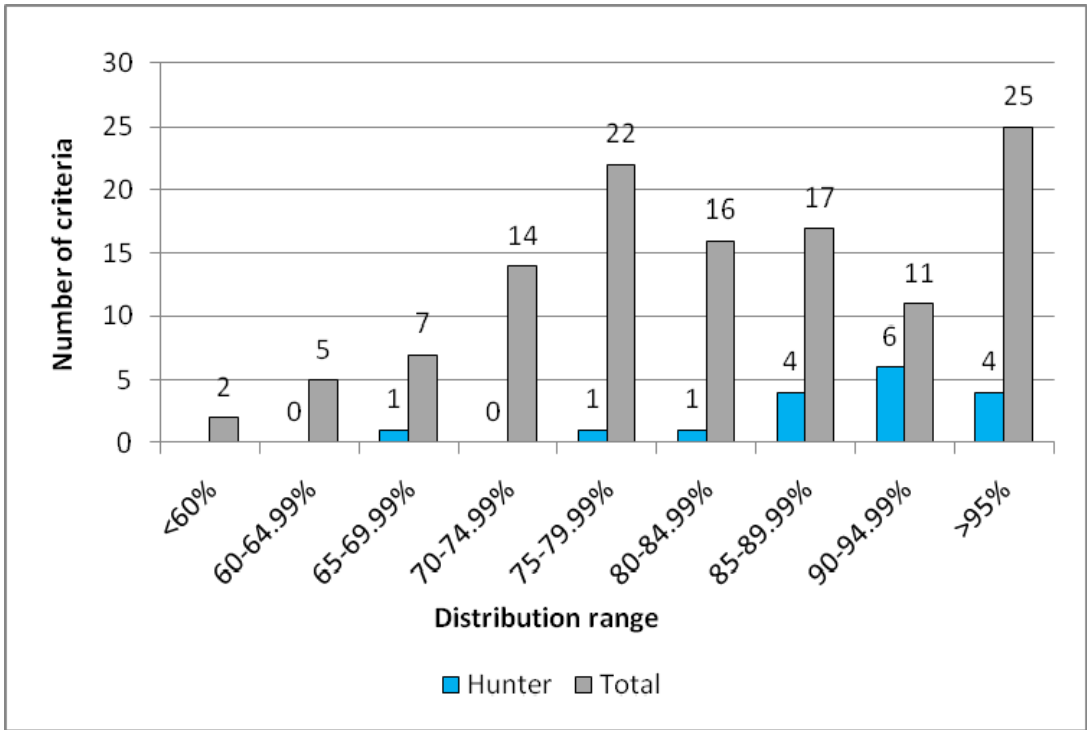
  As for the other regions, sub-question 16.5 (training in emergency procedures) had a lower compliance score, with 61.02%, compared with over 90% for the other sub-questions in this criterion.

- *Fitness for work (criterion 17)*

  Sub-questions 17.1 and 17.3 scored over 97%, but sub-question 17.2 about the policy including drugs, alcohol and fatigue scored considerably lower with 74.58%.

The highest frequency of scores for the MSMP criteria across Hunter region operations was six scores in the 90-94.99% distribution range, followed by four scores in the 85-89.99% and over 95% distribution ranges (Graph 4.13).

Graph 4.13: Distribution of average compliance scores for MSMP criteria for the Hunter region.



Lightning Ridge

One operation in this region was audited for compliance with MSMP requirements. The audit results therefore cannot be used to gauge any broader pattern of compliance for mines in this region.

The overall score for the audited operation was 86.76% compliance. The operation scored 100% compliance for the following criteria:

- Plan development (criterion 1)
- Safety and health policy (criteria 2)
- Management structure (criteria 3)
- Job safety analysis (criteria 9)
- Maintenance programs (criteria 12)
- Reporting of incidents (criteria 14)
- Fitness for work (criteria 17)

The lowest scoring criteria were 46.76% for identifying hazards (criterion 6), 68% for assessing risks (criteria 7) and 65% for reporting workplace hazards and inspections (criterion 8). All other criteria scored over 72% (see Graphs 4.12(a) and 4.12(b)).

As for the other regions, there was a large range of scores for sub-questions within some of the criteria. The main ones were as follows:

- *Consultation and communication (criterion 5)*

  Both sub-question 5.1 and 5.3 scored 100%, but sub-question 5.2 (asking about whether the MSMP has been explained to employees) scored 40%.

- *Identifying hazards (criterion 6)*

  Sub-questions 6.1 and 6.2 scored 20% each (about identifying and listing hazards, and display of warning signs). Sub-question 6.3 about access and use of OHS information when identifying hazards scored 100%.

- *Assessing risks (criterion 7)*

  Sub-questions 7.1 (assessing risks for identified hazards), 7.2 (assessing hazards prescribed in legislation), 7.4 (prioritising risks) and 7.5 (use of hierarchy of controls) all scored 60% compliance. Sub-question 7.3 about involvement of employees in assessing risks scored 100%.

- *Reporting workplace hazards and inspections (criterion 8)*

  Sub-questions 8.2 (written inspection checklists) and 8.4 (hazard reporting procedure) scored 100%. This is compared to 40% for sub-question 8.1 (regular inspection of workplace) and 20% for sub-question 8.3 (corrective action plan after inspection).

- *Emergency preparedness (criterion 11)*

  As for other regions, the lowest scoring sub-question for this criterion was 11.5 about conducting emergency drills. The audited Lightning Ridge operation scored 20% for this sub-question.

- *Work environment (criterion 13)*

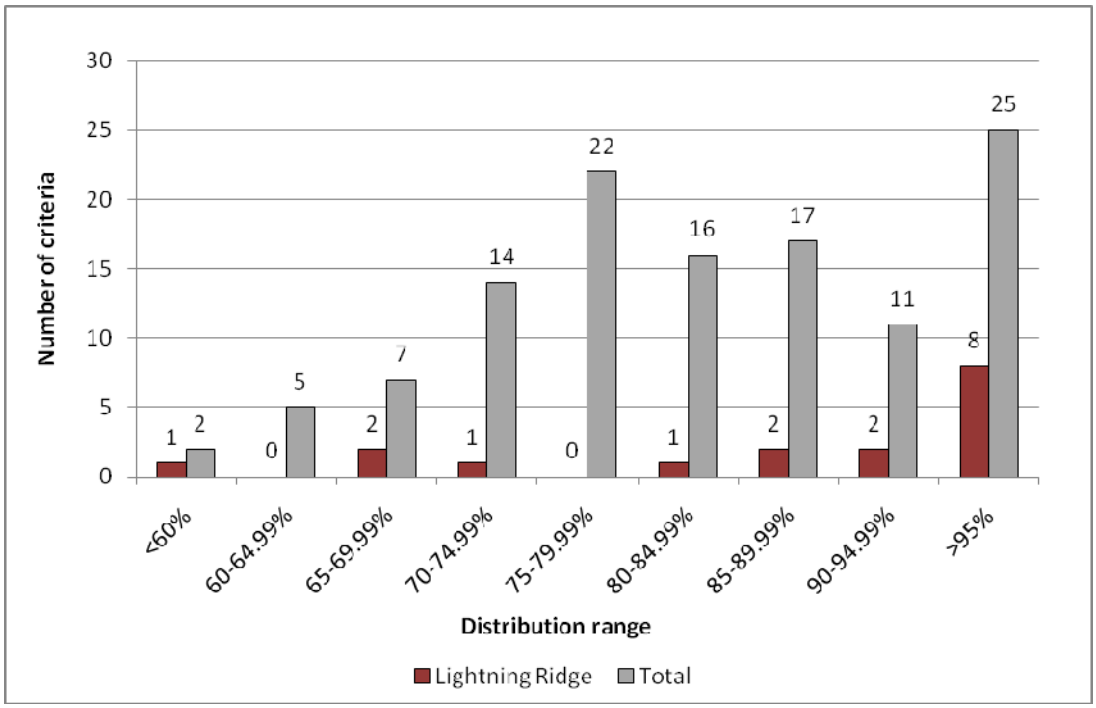
  Sub-questions 13.1 (identifying and assessing hazards) and 13.4 (records of the work environment) scored 100%. Sub-questions 13.2 (inclusion of all work environment hazards) and 13.3 (corrective actions for hazards) both scored 60%.

- *Training and development (criterion 16)*

  Sub-question 16.5 (training in emergency procedures) scored a low of 60%. Sub-question 6.7 (training on OHS responsibilities for employees and supervisors scored 80%. All other sub-questions in this criterion scored 100%.

Graph 4.14 below shows that the distribution of scores for MSMP criteria for the audited Lightning Ridge operation. The scores most frequently fell in the over 95% distribution range (eight of the 17 criteria), with an otherwise fairly even distribution across the remaining distribution ranges.

Graph 4.14: Distribution of average compliance scores for MSMP criteria for the Lightning Ridge.

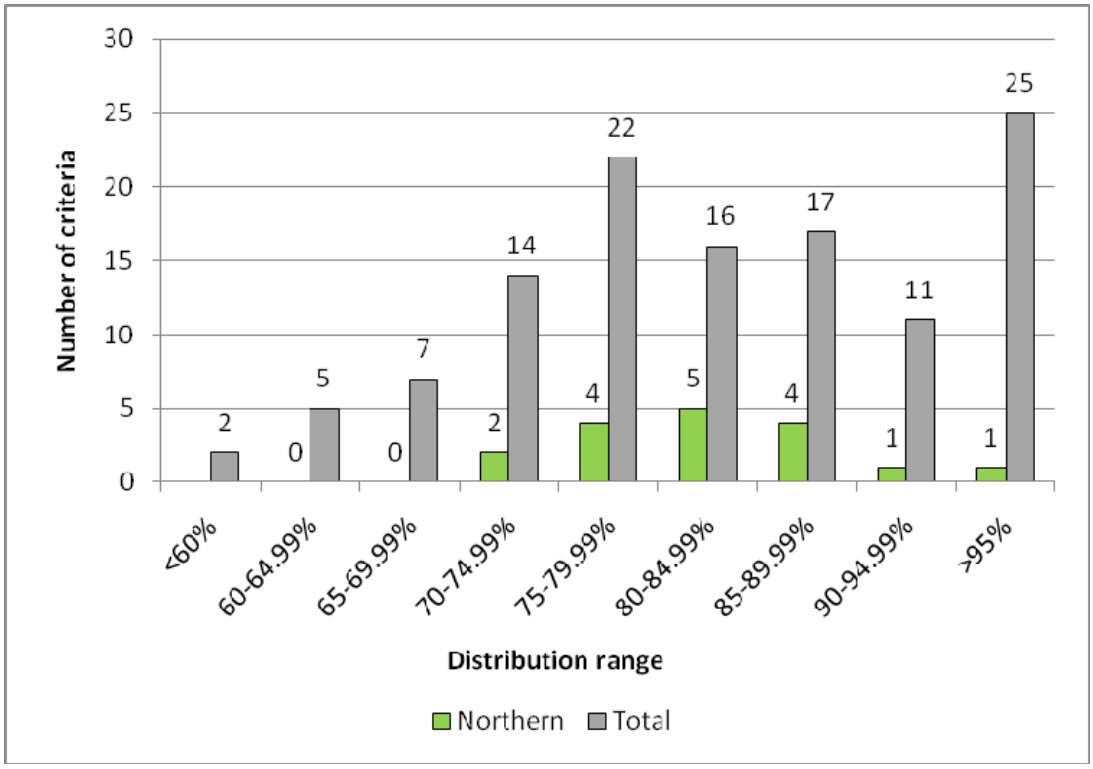


Northern

Northern mining operations scored 82.33% overall. The highest average scores for MSMP criteria for Northern mines were 96.09% for plan development (criterion 1) followed by 91.01% for safety and health policy (criterion 2) and 88.35% for reporting accidents and incidents (criterion 14). The lowest score was 72.17% for work environment (criterion 13) (see Graphs 4.12(a) and 4.12(b)).

The highest frequency of scores for audit criteria for Northern region mines was in the 80-84.99% distribution range (five scores), followed by the distribution ranges of 75-79.99% and 85-89.99% with four scores each (Graph 4.15).

Graph 4.15: Distribution of average compliance scores for MSMP criteria for the Northern region.



Again, there was a large range of scores across sub-questions within many of the criteria.

- *Assessing risk (criterion 7)*

  Northern mines scored 81.74% overall for this criterion. Scores for the sub-questions ranged from 58.26% for sub-question 7.2, about assessing the prescribed hazards in legislation, to 89.57% for sub-question 7.3 about employee involvement in hazard assessment. All other sub-questions scored greater than 86%.

- *Management structure (criterion 3)*

  As for mines in the Central West, the highest score for Northern region mines within criterion 3 was for sub-question 3.2 (production manager included in management structure) and the lowest for sub-question 3.4. The scores for these sub-questions were 97.39% and 69.57% respectively.

- *SWMS (criterion 10)*

  Scores ranged from 56.36% for sub-question 10.5 about permits for high-risk activities to 86.96% for sub-question 10.2 (risk assessment used in preparation of SWMS).

- *Emergency preparedness (criterion 11)*

  Scores ranged from 46.09% for sub-question 11.5 (carrying out of emergency drills) to 87.83% for sub-question 11.2 (emergency response procedures).

- *Contractor management (criterion 15)*

  Sub-question 15.3 about a procedure in MSMP to manage contractors scored highest at 91.3%. Sub-question 15.4 about development of SWMS for all contractor work scored 74.78% and sub-question 15.1 about up-to-date register of contractors scored 76.52%.

- *Training and development (criterion 16)*

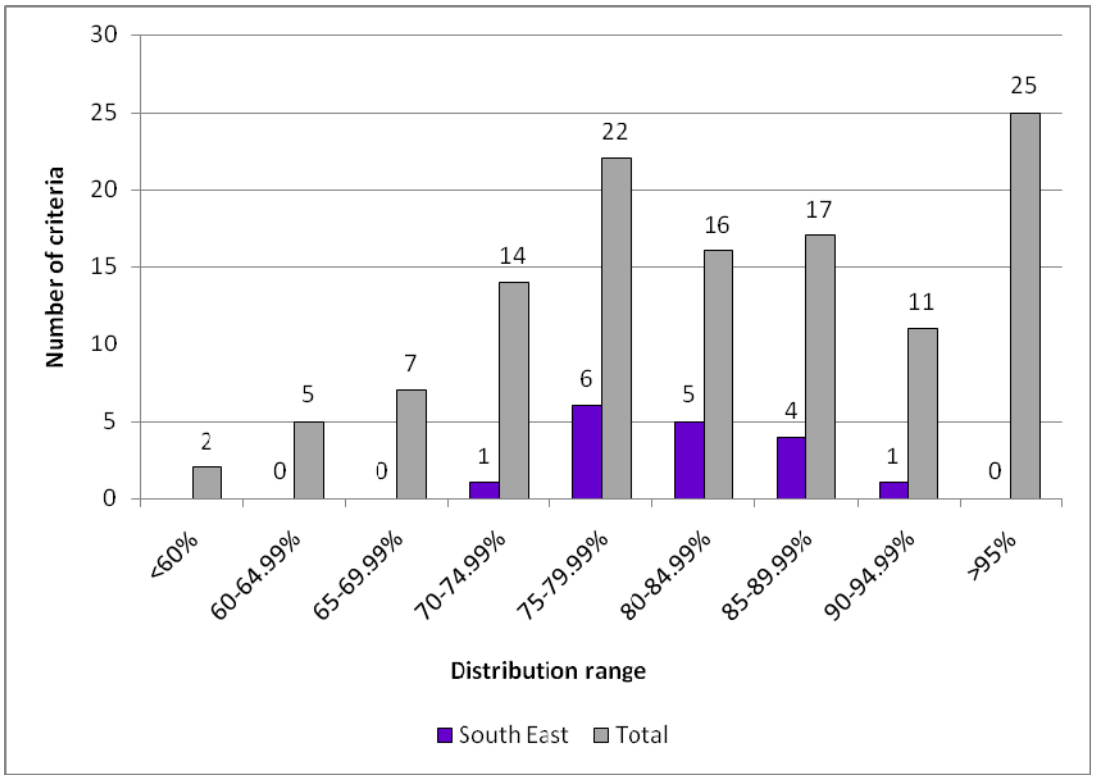
  Sub-questions 16.4 (training in fire fighting equipment) and 16.5 (training in emergency procedures) scored lowest with 65.22% and 66.96% respectively. Sub-question 16.7 about training being given to supervisors and employees scored 70.43%. The other criteria all scored over 86%, with the highest 91.3% (sub-question 16.6 dealing with first aid training).

South East

South East region operations scored an overall average of 80.70% compliance for the MSMP audit. The lowest scores in this region for criteria were 74.58% for work environment (criterion 13) and 75.38% for emergency preparedness (criterion 11). Again, the overall emergency preparedness score was lowered by the result for sub-question 11.5 about conducting emergency drills (see Graphs 4.12(a) and 4.12(b)). This sub-question scored 54.44% while the other sub-questions all scored over 76%.

The distribution of average scores for MSMP criteria in the South East region is represented below in Graph 4.16. All but one of the criteria most frequently scored over 75%, with six scores in the 75-79.99% range, five in the 80-84.99% range, four in the 85-89.99% range, and one each in the 90-94.99% range. One criteria fell in the 70-74.99% distribution range.

Graph 4.16: Distribution of average compliance scores for MSMP criteria for South East region.



Other than criterion 11 discussed above, criteria that returned a large range of scores for sub-questions included the following:

- *Management structure (criterion 3)*

  As for some of the other regions, the highest scoring sub-question was 3.2 about inclusion of a production manager in the management structure. In the South East, this sub-question scored 87.12%. The lowest was 67.12% for sub-question 3.4 (assessing whether the management structure included persons to fill/act in vacant positions). The other two sub-questions scored 78.9%.

- *Assessing risk (criterion 7)*

  Scores for the sub-questions ranged from 58.33% for sub-question 7.2, about assessing the prescribed hazards in legislation, to 82.78% for sub-question 7.3 about employee involvement in hazard assessment. The other criteria scored over 78%.

- *Contractor management (criterion 15)*

  Sub-question 15.3 about a procedure in MSMP to manage contractors scored highest at 85.75%. Sub-question 15.4 about development of SWMS for all contractor work scored 66.67%. Sub-question 15.1 about up-to-date register of contractors scored 75.89% and sub-question 15.2 about induction training scored 80.55%.

- *Training and development (criterion 16)*

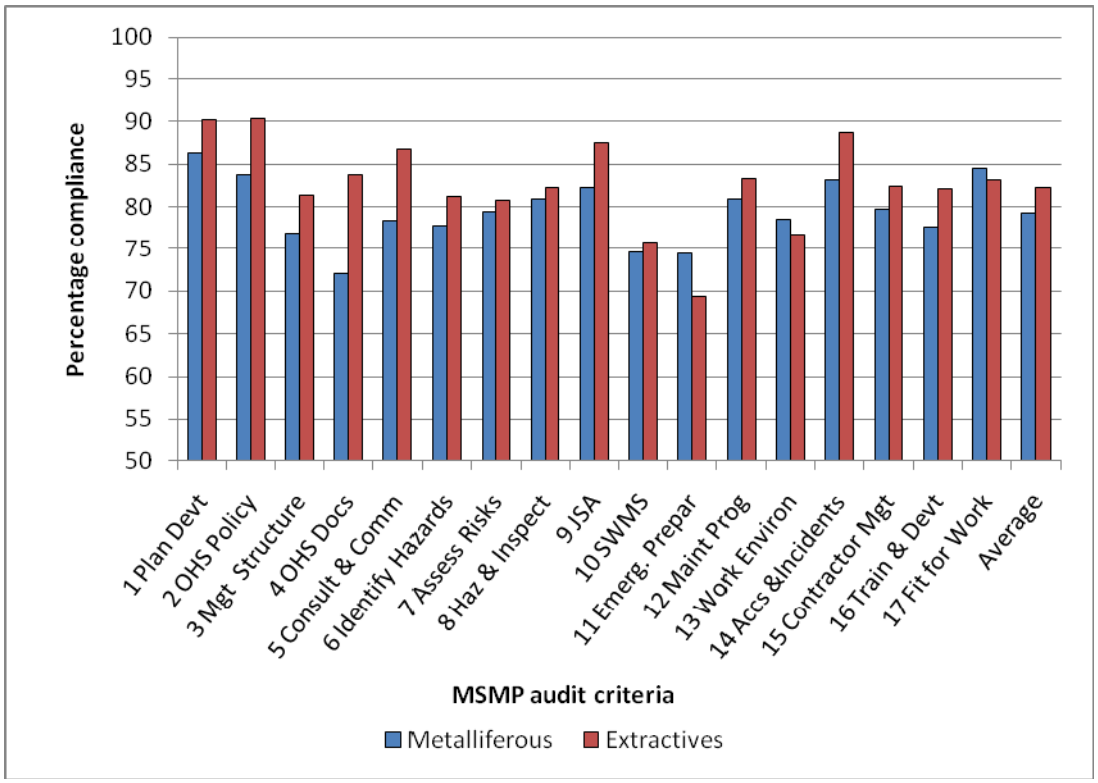
  Sub-question 16.4 (training in use of fire fighting equipment) had the lowest compliance score, with 64.44%. All the other criteria scored over 76%, with sub-question 16.3 (induction training) scoring the highest with 89.32% compliance.

Operation types

Extractive operations tended to be slightly more compliant with the MSMP audit requirements than metalliferous operations, as shown in Graph 4.17. (As only one operation classified as 'other' was audited, those results have not been included in the graph). The highest scoring criteria for metalliferous were 86.27% for criterion 1 (plan development), followed by criterion 17 on 84.44% (fitness for work), 83.81% for criterion 2 (OHS policy) and 83.24% for criterion 14 (reporting accidents and incidents). The lowest scoring criteria were about OHS documents with a score of 72.06% (criterion 4), 74.48% for emergency preparedness (criteria 11), 74.67% for SWMS (criterion 10).

The highest scoring criteria for extractives were safety and health policy (criterion 2) with 90.30, followed by plan development (criterion 1) with 90.23%. The lowest scoring criteria were 69.37% for emergency preparedness (criterion 11), SWMS (criterion 10) with 75.85% and work environment (criteria 13) with 76.76% compliance. The only criteria where metalliferous operations were more compliant than extractive were criterion 11 (emergency preparedness), criterion 13 (work environment) and criterion 17 (fit for work).

Graph 4.17: Average compliance scores for MSMP audit criteria by operation type.



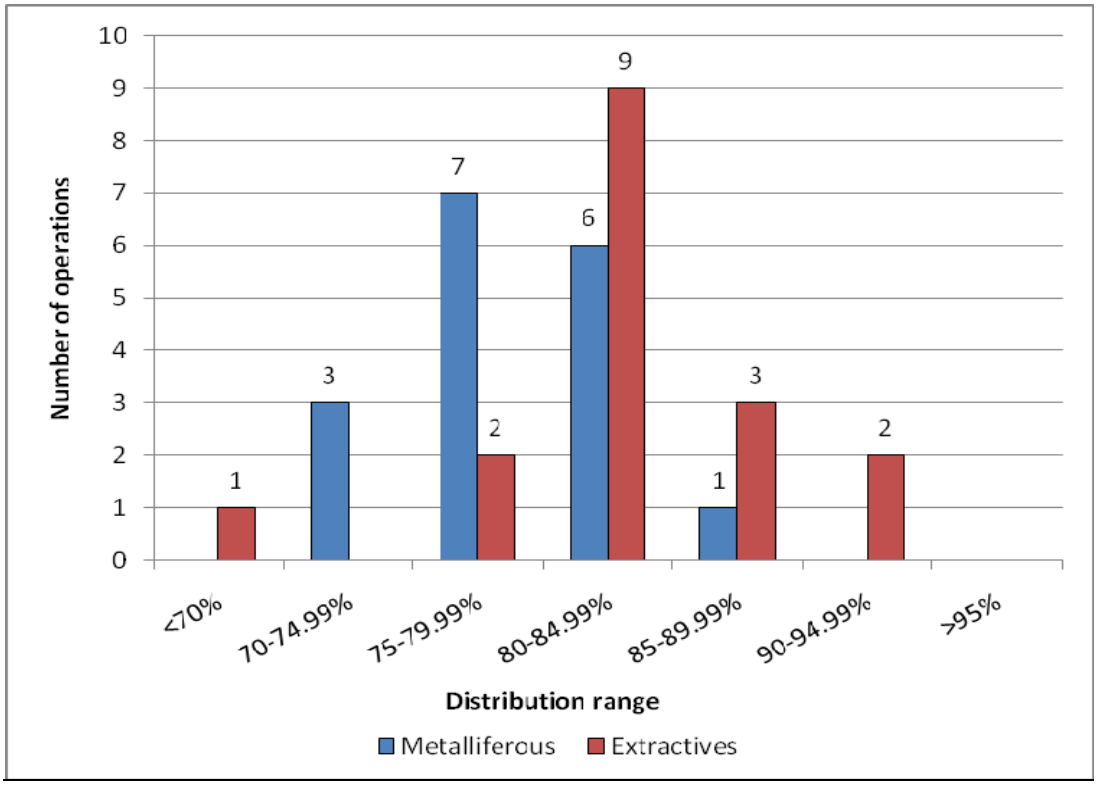
The distribution of scores for criteria across operation types is shown in Graph 4.18 below. As expected from the discussion above about average scores for criteria by operation type, the distribution curve for extractive operations is in a higher compliance range than the curve for metalliferous operations. The majority of criteria scores for extractive operations scored in the 80-84.99% range (nine criteria), with the next highest frequency of scores in the 85-89.99% range (three criteria) and two each in the 70-74.99% the 90-94.99% ranges.

For metalliferous operations, the highest frequency of scores fell in the 75-79.99% range (seven criteria), closely followed by six scores in the 80-84.99% range. No criteria scored above 90% for metalliferous operations. Three criteria scored in the 70-74.99% range.

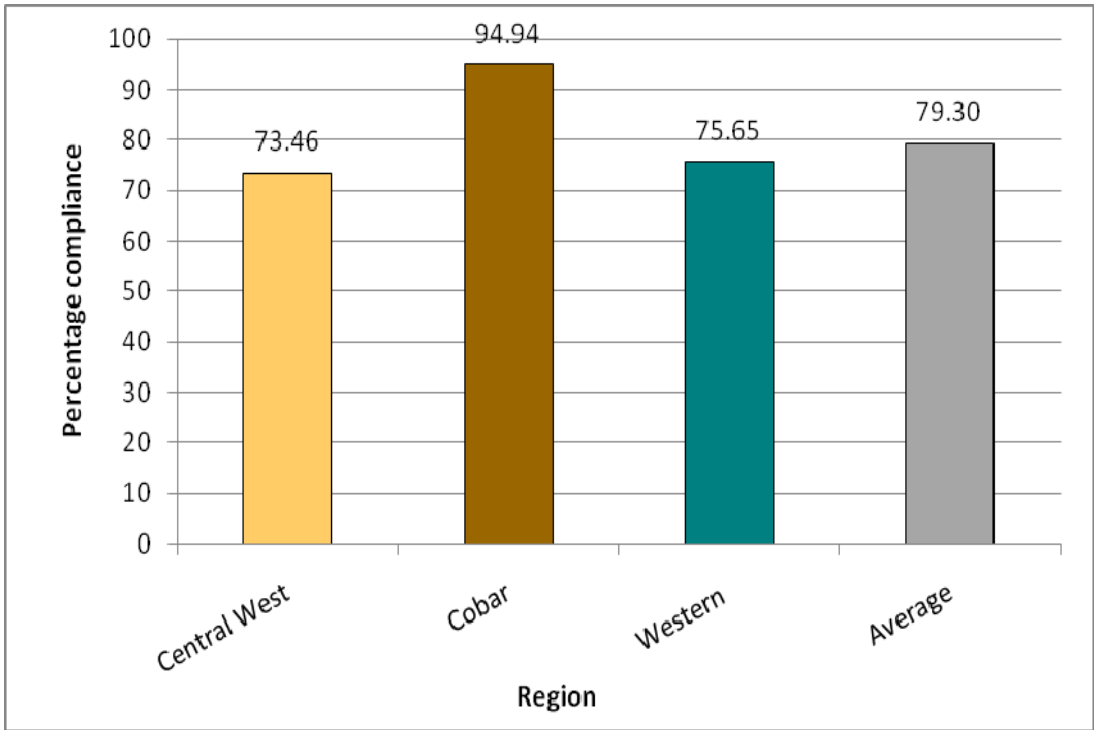
Region and type of operation

Graph 4.19 below shows that Western, Central West and Cobar regions returned audits for metalliferous mines. Metalliferous operations around Cobar were most compliant with an average score of 94.94%. Operations in the Western and Central West regions scored fairly evenly, with 75.65% and 73.46% compliance respectively. This compares to an overall average for metalliferous operations of 79.30%.

Graph 4.18: Distribution of average compliance scores for MSMP audit criteria by operation type.

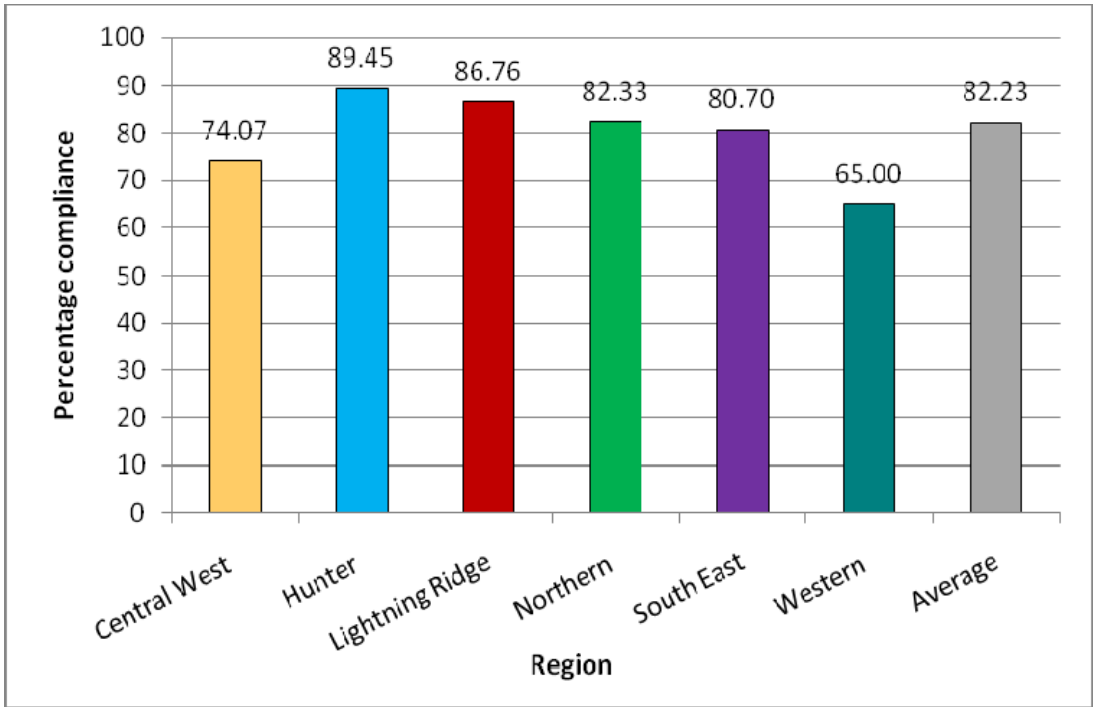


Graph 4.19: Average percentage compliance with MSMP audit for metalliferous operations by region.



All regions except Cobar returned audit results for extractive operations. Extractive operations in the Hunter region were the most compliant (89.45%). The single extractive operation audited in Lightning Ridge was next most compliant (86.76%), followed by extractive operations in the Northern region (82.33%) and South East (80.70%). Western region extractive operations were the least compliant, with a score of 65%. Operations in the Central West region scored an average of 74.07%. The average compliance with MSMP audit criteria across all extractive operations was 82.23% (see Graph 4.20).

Graph 4.20: Average percentage compliance with MSMP audit for extractive operations by region.



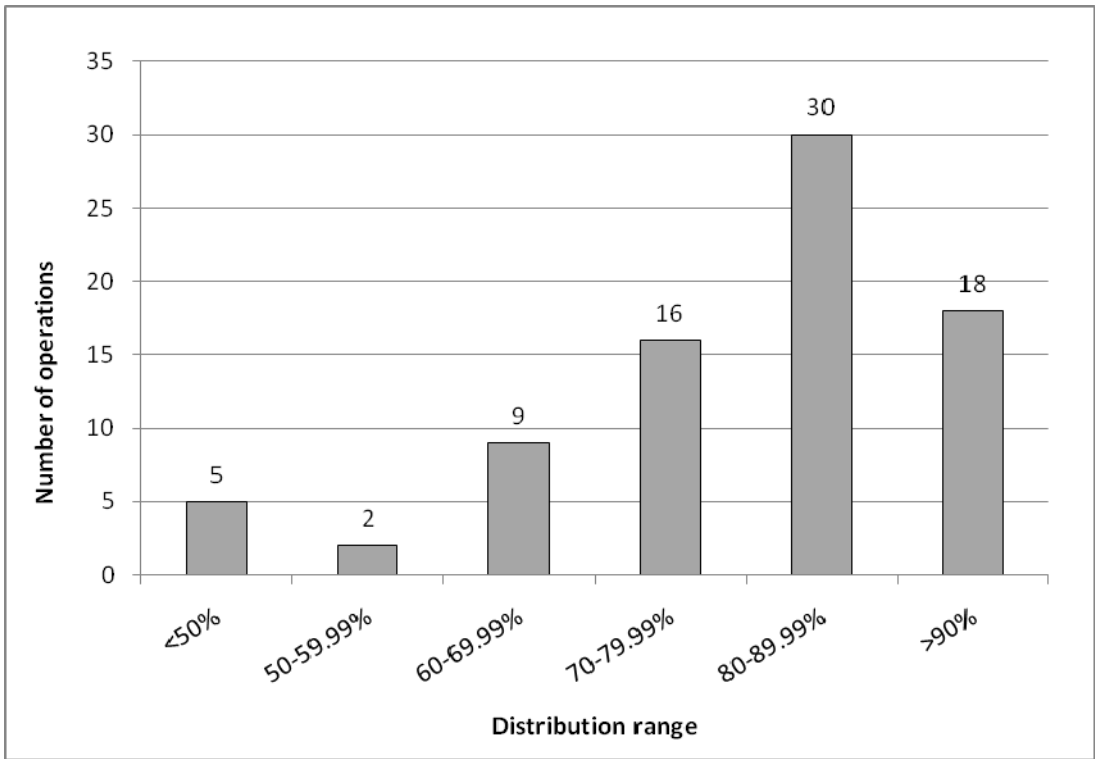
5. Findings for CMP Audit

5.1 Compliance by operation

Overall

The overall percentage compliance across the 80 mining operations included in the CMP audit analysis ranged from 37.50% to 100% with an average of 80.41%. The highest number of operations (30) fell in the 80-90% distribution range. The ranges of 70-79.99% and over 90% contained 16 and 18 operations respectively. Five operations scored below 50% (Graph 5.1 below).

Graph 5.1: Distribution of overall CMP audit compliance scores for individual operations.



Regions

Graph 5.2 below shows the overall average compliance scores for the CMP audit by region. The large metalliferous mines around Cobar were the most compliant with the CMP audit criteria, achieving the highest overall compliance score of 91%.

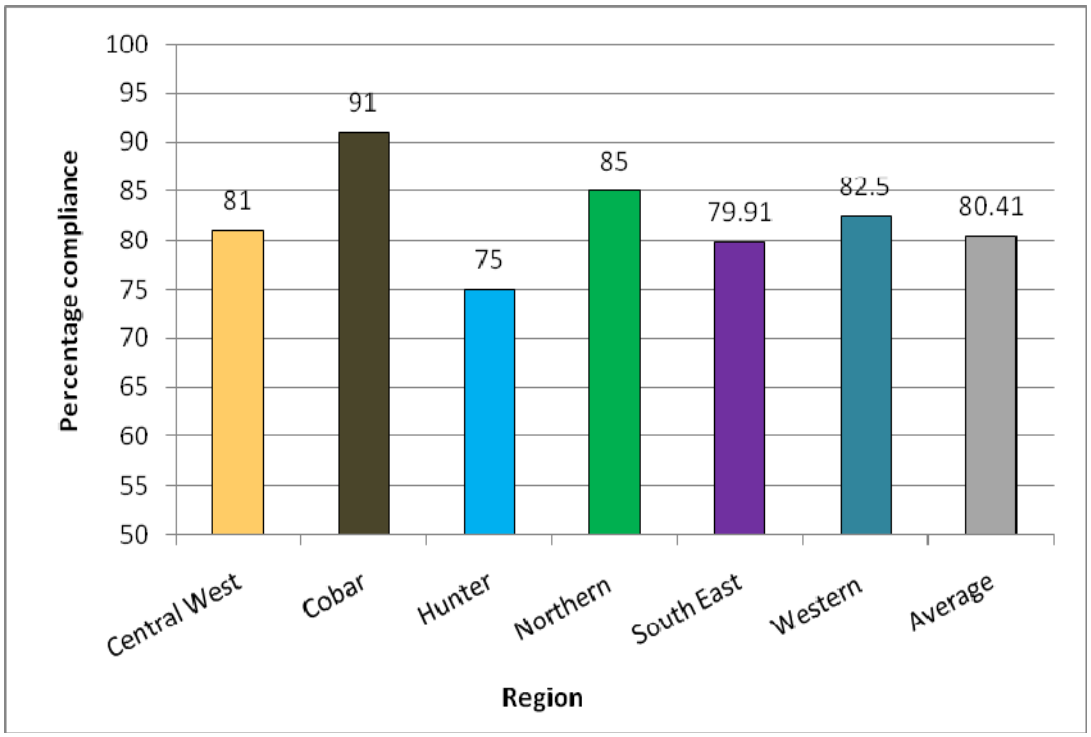
Northern operations scored an average of 85% with two operations in this region returned CMP audit results on COMET at time of analysis. One of these operations scored 80% compliance and the other 90%. Similarly, Western region returned one CMP audit result of 82.5% compliance.

The Central West had the next highest overall compliance score of 81%. Central West also recorded the lowest compliance for an individual mine of 37.5% for an extractive mine. Two operations in the Central West scored 100%.

Hunter region operations averaged 75%, with the lowest score for an individual operation of 45% for a quarry to a high score of 87.50%, also for a quarry.

The South East had the highest number of operations included in the CMP audit analysis, with an average for operations in this region of 79.91% compliance. Scores for individual operations in the South East ranged from 42.5% for a sand/gravel quarry to 100% for both an industrial mineral mine and a waste mine.

Graph 5.2: Percentage compliance for CMP audit compliance scores by region.



Graph 5.3 shows the distribution of scores for audited mines for the Central West, Hunter and South East. The distribution of scores for audited mines in the Central West was fairly even, with the highest number of mines (4 out of the 10 mines audited) scoring over 90%. Two mines scored in each of the 70-79.99% and 80-89.99% distribution ranges. One operation scored in the 60-69.99% range and one scored less than 50%.

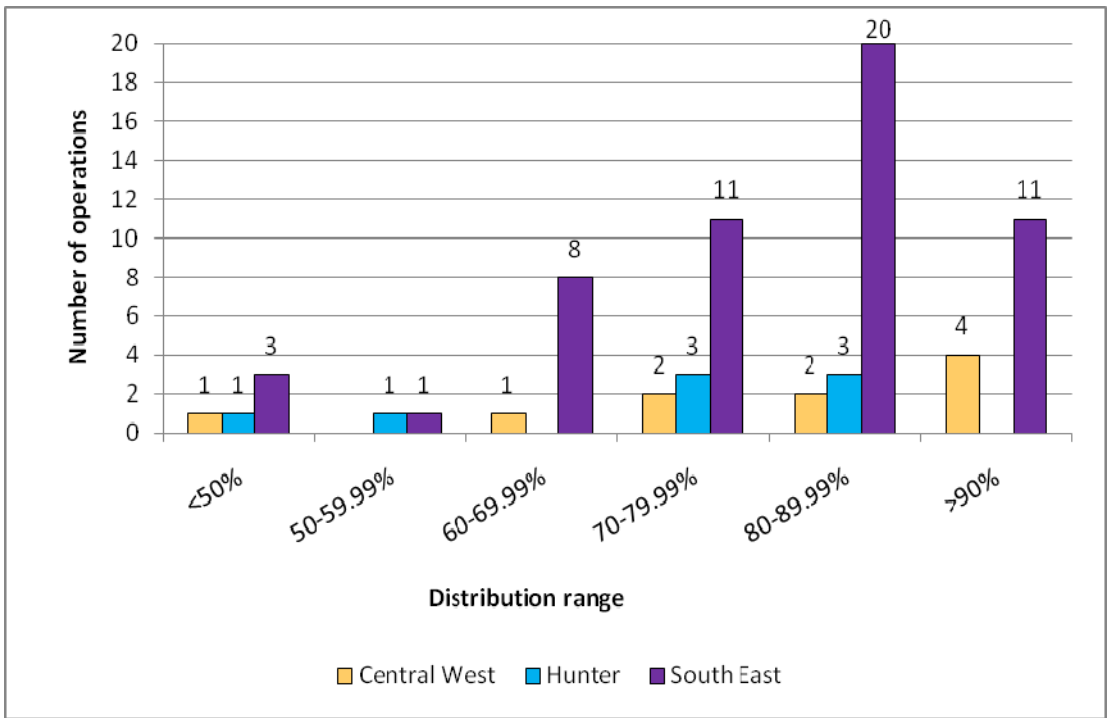
Eight operations were audited in the Hunter, with three operations each scoring in the 70-79.99% and 80-89.99% distribution ranges. As for Central West, one operation scored less than 50%.

South East region returned 54 CMP audit results, with 20 of these operations scoring in the 80-89.99% distribution range. The 70-79.99% and over 90% ranges contained 11 operations each, with eight operations scoring in the 60-69% range. Again, one operation scored less than 50%.

Two Cobar mines scored 100% compliance, with the remaining three included in the audit program scoring 85%.

Not shown on Graph 5.3 are the results for Northern and Western regions, due to the low number of audit result in COMET for these regions. As already discussed, Northern region returned two CMP audit results, with one mine scoring 90% and the other 80%. The single Western mine in the audit results scored 82.5%.

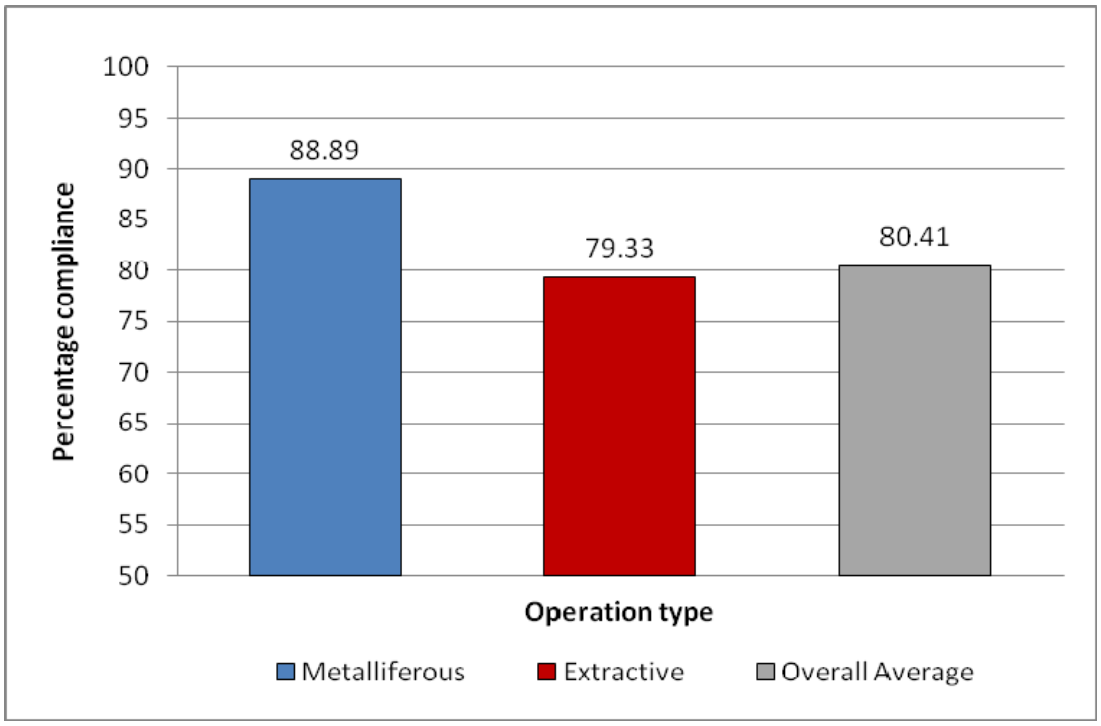
Graph 5.3: Distribution of CMP audit compliance scores by region.



Operation types

Looking at operation types, metalliferous mines were the most compliant with an overall compliance rate of 88.89%. Extractive operations scored 79.33% compliance overall. This is compared to the overall average across all operations of 80.41% (see Graph 5.4).

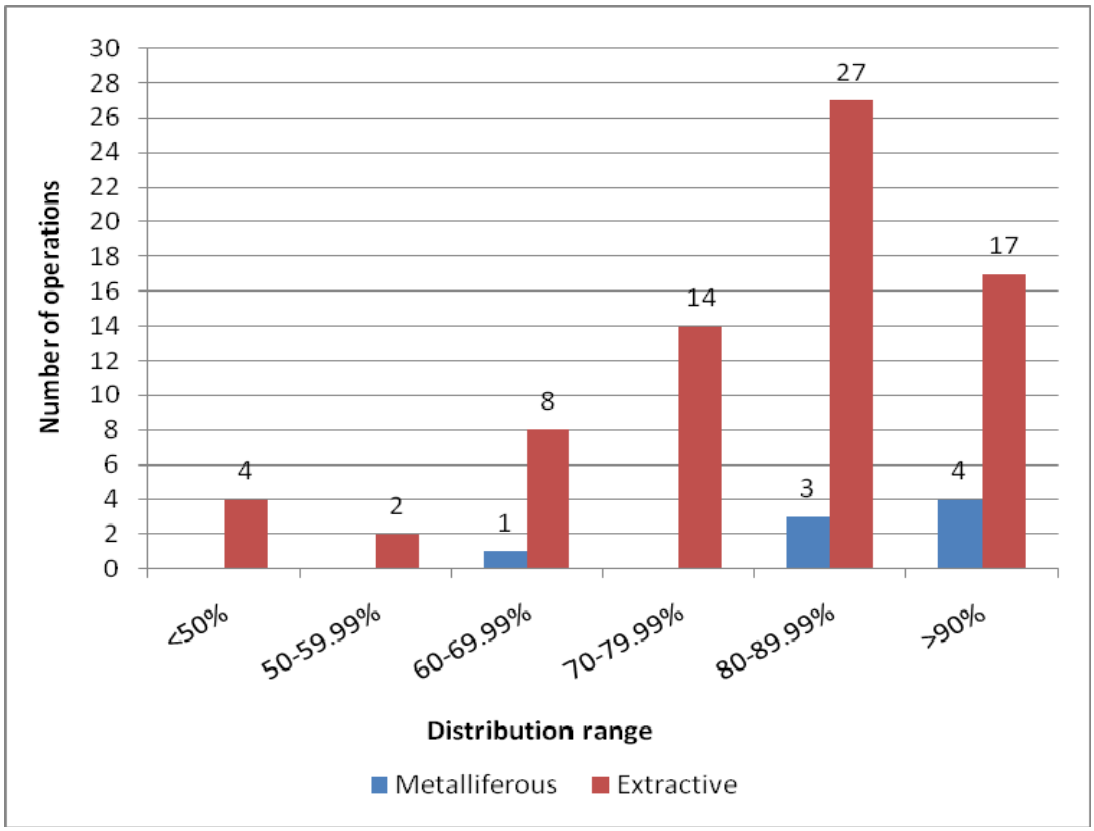
Graph 5.4: Average percentage compliance with the CMP audit by operation type.



The distribution graph below shows that four out of the eight metalliferous operations audited scored over 90%, with three operations scoring in the 80-89.99% range. One metalliferous operation scored in the 60-69.99% range.

For extractive operations, the highest frequency of operations fell in the 80-89.99% range (27 out of the 72 extractive operations audited). Seventeen operations scored over 90%, followed by 14 in the 70-79.99% range. Four extractive operations scored below 50% (see Graph 5.5).

Graph 5.5: Distribution of percentage compliance scores for CMP audit by operation type



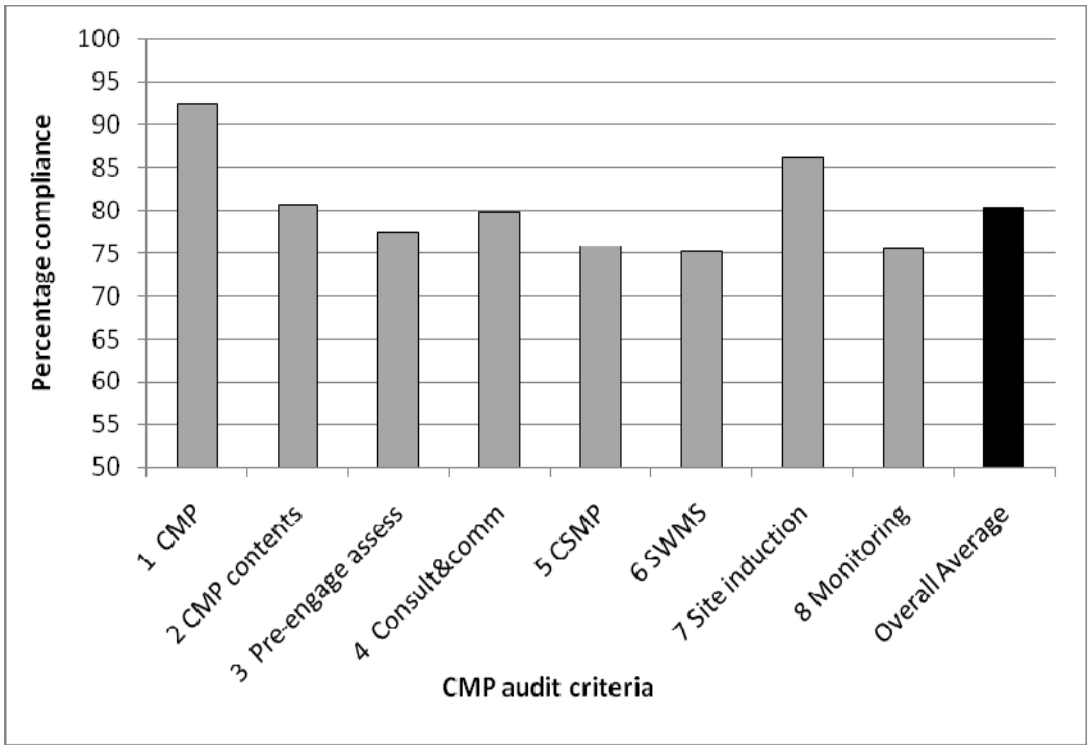
5.2 Compliance by criteria

Overall

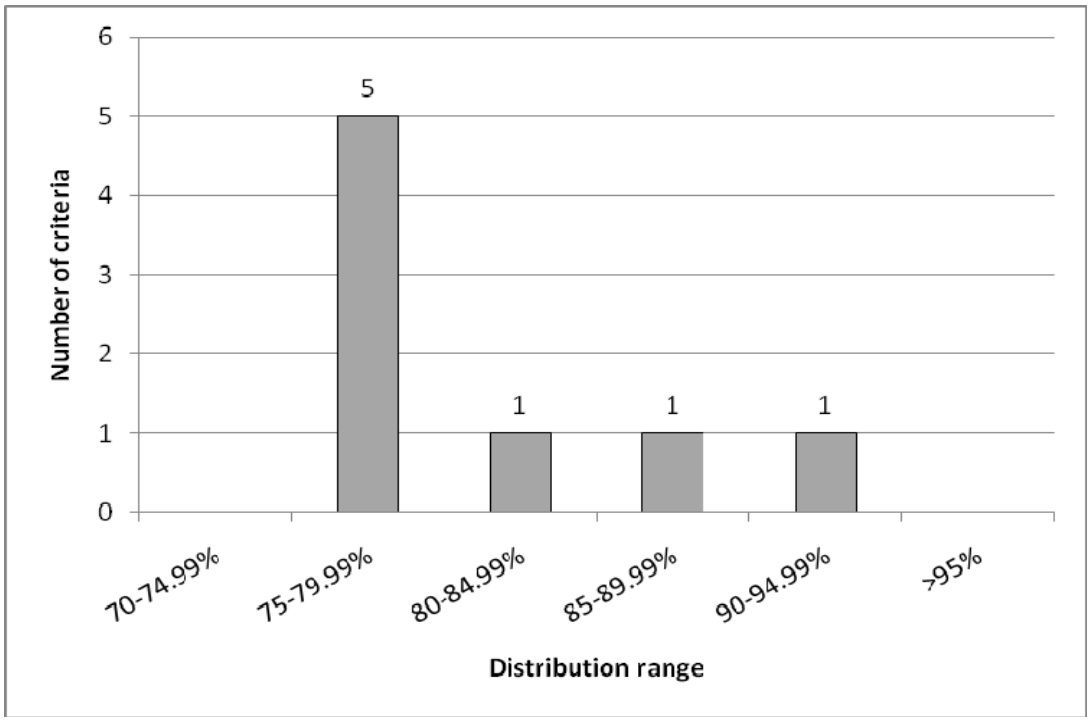
Graph 5.6 below shows that the highest scoring criterion overall was criterion 1 testing the existence of a CMP in accordance with the MHS legislation (92.5%). Criterion 7 about site induction of contractors was next highest (86.25%), followed by criterion 2 about CMP contents (80.75%). The least compliant criteria overall were criterion 6 dealing with contractor safety management plans (75.25%), criterion 8 testing monitoring of contractors (75.5%) and criterion 5 dealing with SWMS (75.75%).

As shown in Graph 5.7 below, most criteria averaged in the 75-79.99% distribution range (five out of the eight criteria).

Graph 5.6: Average percentage compliance for CMP audit criteria across operations.



Graph 5.7: Distribution of overall compliance scores for CMP audit criteria.



Regions

As already mentioned, the metalliferous mines around Cobar scored the highest overall at 91% compliance. For the Cobar region, the highest average score for a CMP audit criterion was 100% for criterion 1 (CMP) followed by 96% for both criteria 3 (pre-engagement assessment) and criterion 7 (site induction). The lowest scoring criteria were contractor SWMS (criterion 6) with 76%, followed by CMP contents (criterion 2) and monitoring of contractors (criterion 8) both with 88% (Graph 5.8a).

For the Central West mines, the highest average score for the CMP criteria was 88% for both criterion 1 (CMP) and criterion 7 (site induction). The lowest average criterion score for Central West mines was 74% for both criterion 3 (pre-engagement assessment) and criterion 6 (SWMS) (Graph 5.8a). The overall compliance score for mines in the Central West was 81%.

The overall compliance score for Hunter operations was 75%. The lowest scoring criteria for Hunter region operations was 67.5% for both criteria 6 (SWMS) and criteria 8 (monitoring contractors). The highest average score for a criterion was 95% for CMP (criterion 1) (Graph 5.8a).

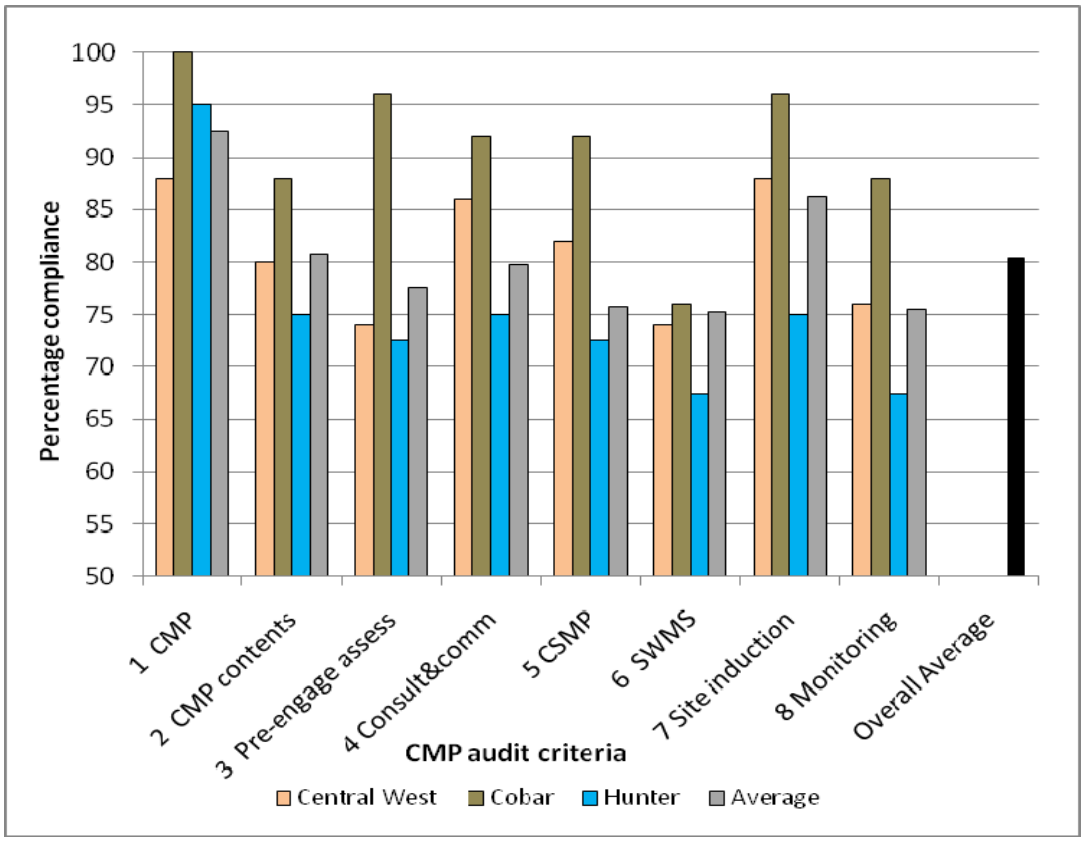
Graph 5.8b below shows the average compliance scores for CMP audit criteria in the Northern, Western and South East regions.

The one operation in the Western region included in the CMP audit program scored 100% for consultation and communication (criterion 4) and 80% for all other criteria. The audit results for this operation has been included in Graph 5.8b below, but it should be noted that it may not be representative of other mines or compliance trends in the region.

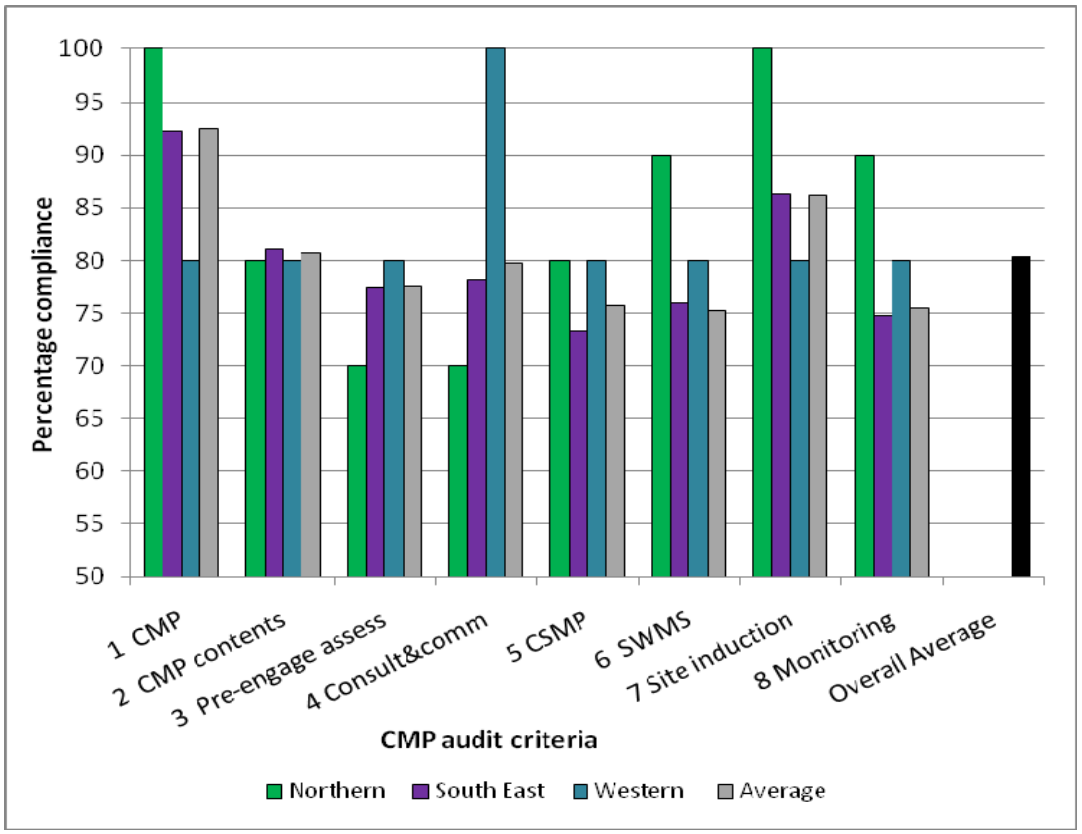
The two Northern region operations included in the CMP audit program recorded the highest average score of 100% for criteria 1 (CMP) and criterion 7 (site induction). The lowest average score was 70% for both criteria 3 (pre-engagement assessment) and 4 (consultation and communication). As for the audit results for the mine in the Western region, the results for these two Northern operations have been included in Graph 5.8b below, but may not be representative of broader regional compliance trends.

The highest average criterion score for audited mines in the South East region was 92.22% for criterion 1 (CMP), followed by 86.3% for criterion 7 (site induction). The lowest was 74.81% for criterion 8 (monitoring contractors).

Graph 5.8a: Average compliance scores for CMP audit criteria in the Central West, Cobar and Hunter regions.



Graph 5.8b: Average compliance scores for CMP audit criteria in the Northern, Western and South East regions.



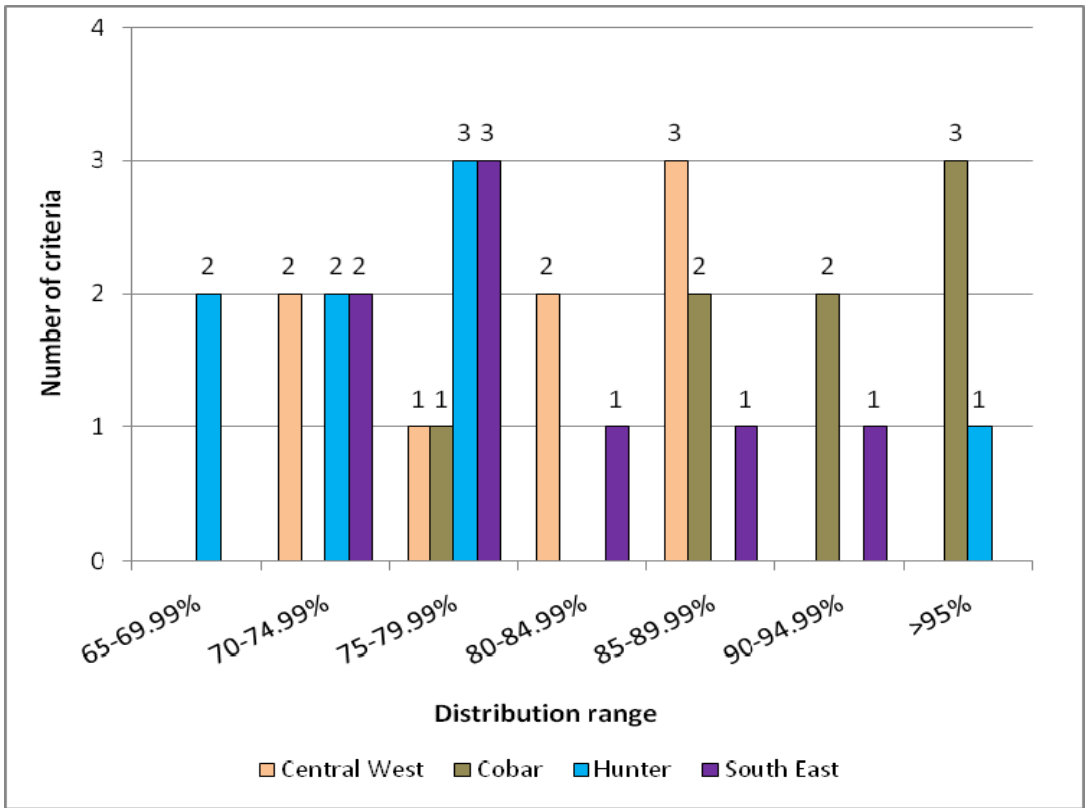
The score distribution for CMP audit criteria for Central West, Cobar, Hunter and South East is shown in Graph 5.9 below. Results for Western and Northern operations were not included because of the low number audit results in COMET for these regions.

The graph shows that in the Central West, average scores for the CMP criteria most frequently fell with the 85-89.99% distribution range (three out of the eight criteria), with two criteria each in the 70-74.99% and 80-84.99% ranges. One operation fell in the 75-79.99% range.

In the Cobar region, the highest frequency of scores for the CMP audit criteria fell in the over 95% distribution range (three out of the eight criteria), with two each in the 85-89.99% and 90-94.99% range. As for the Central West region, the remaining criterion fell in the 75-79.99% range.

Operations in the South East and Hunter had a similar distribution curve, with criteria scores most frequently falling in the 75-79.99% distribution range (three out of the eight criteria), followed by two criteria in the 70-74.99% range. However, two criteria scored 65-69.99% range for Hunter operations and one in the over 95% range. For the South East, one criterion scored in each of the 80-84.99%, 85-89.99% and 90-94.99% ranges.

Graph 5.9: Distribution of average compliance scores for CMP audit criteria by region.

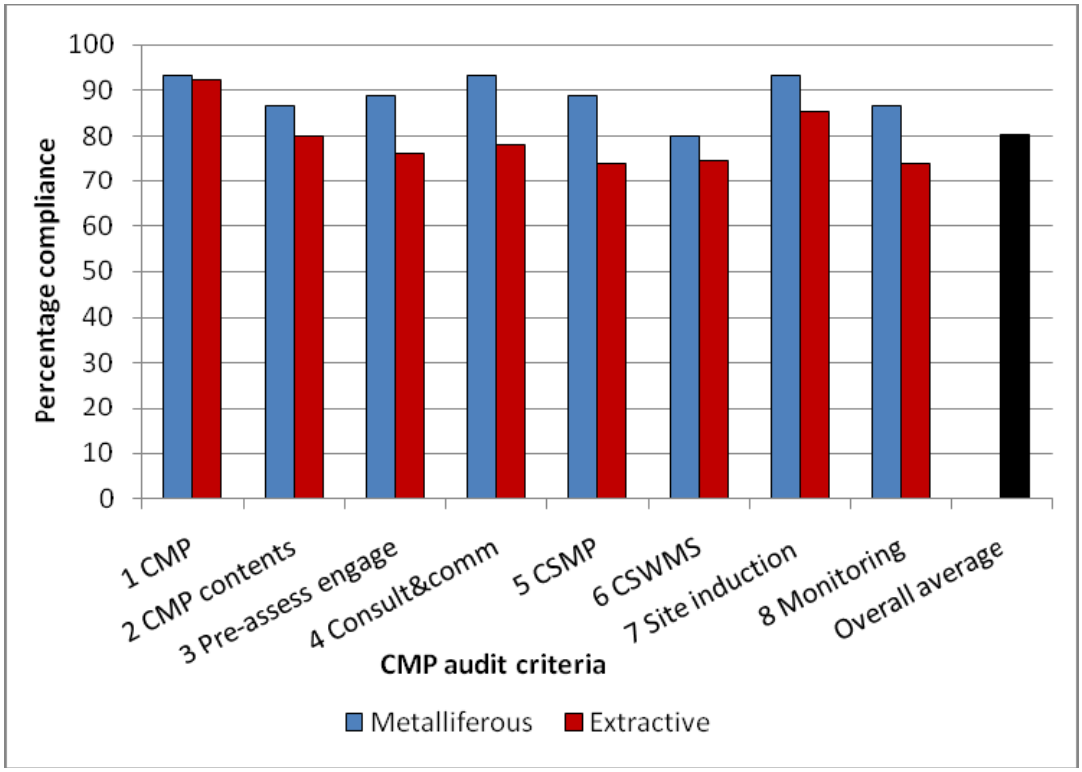


Operation types

As shown in Graph 5.10 below, the highest average score across metalliferous mines for CMP audit criteria was 99.33% for criterion 1 (CMP), criterion 4 (consultation and communication) and criterion 7 (site induction). This was followed by 88.89% each for criterion 3 (pre-engagement assessment) and criterion 5 (CSMP), and 86.67% each for criterion 2 (CMP contents) and criterion 8 (monitoring contractors). The lowest average score for a criterion was 80% for contractor SWMS (criterion 6).

For extractive operations, the highest average CMP audit criteria score was also for criterion 1 (CMP) with 92.39%, followed by 85.35% for criterion 7 (site induction) and 80% for criterion 2 (CMP content). The other criteria scores fell between 74.08% and 78.03% compliance.

Graph 5.10: Average compliance for scores for CMP audit criteria by operation type.



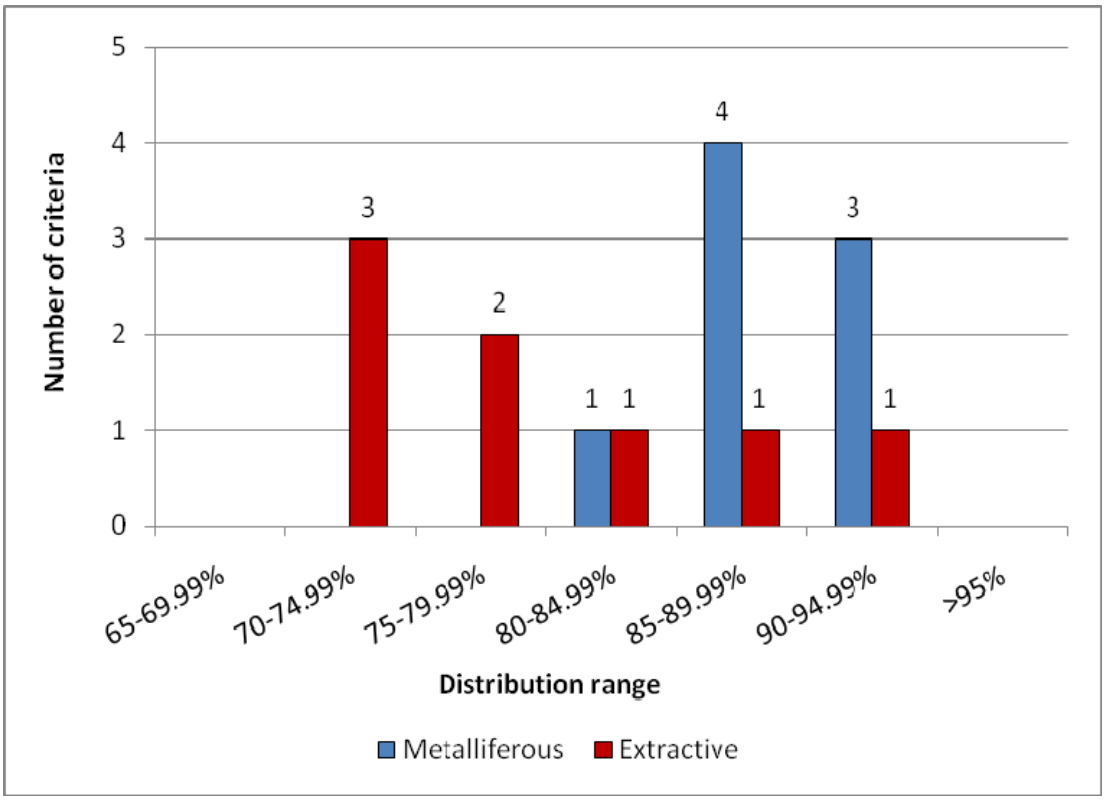
As indicated by the compliance scores for the CMP criteria discussed above, the range of compliance scores for CMP criteria by extractive operations was greater than that of metalliferous operations. For metalliferous operations, scores were concentrated in the 85-89.99% (four) and 90-94.99% (three) distribution ranges. One criterion scored in the 80-84.99% range. This is compared to the distribution of average scores for criteria by extractive operations, where three scores fell in the 70-74.99% distribution range, two in the 75-79.99% range and one each in the 80-84.99%, 85-89.99% and 90-94.99% ranges (Graph 5.11).

Region and type of operation

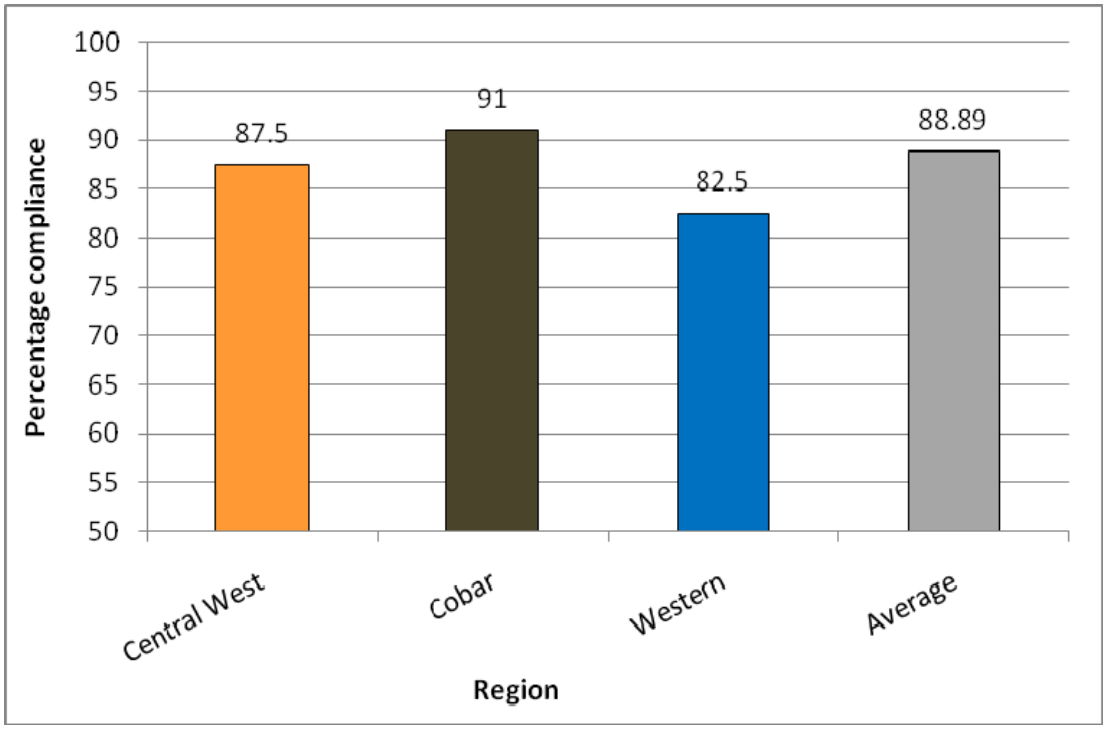
Only Central West region recorded results for both metalliferous and extractive operations. The Hunter, Northern and South East regions recorded results for extractive type operations as no metalliferous mines are operating in these regions. Western region and Cobar recorded results for metalliferous type operations. None of the regions recorded CMP audit results for "other" operation types.

The metalliferous operations in Cobar scored an average of 91%, which was more compliant than the metalliferous mines in the Central West and the Western region. Western region metalliferous mines scored an average of 82.5%. In the Central West, metalliferous operations scored 87.5%. Metalliferous operations in the Central West were more compliant overall than extractive operations in the region, which scored an average of 78.21% (Graph 5.12).

Graph 5.11: Distribution of average compliance scores for CMP audit criteria by operation type.

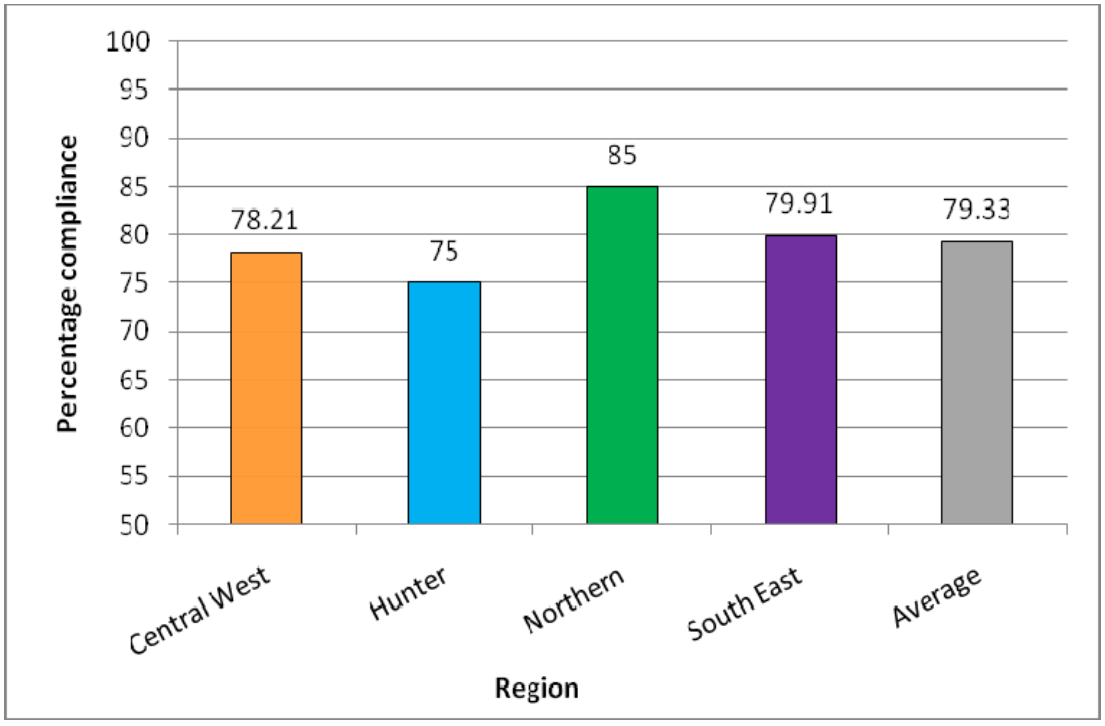


Graph 5.12: Average percentage compliance with CMP audit for metalliferous operations by region.



For extractives, operations in the Northern region were most compliant on average with two operations recording results for the CMP audit in this region. Extractive mines in the South East were the next most compliant with an average compliance score of 79.91%, followed by extractive operations in the Central West (78.21%) and the Hunter (75%) (see Graph 5.13).

Graph 5.13: Average compliance with CMP audit for extractive operations by region.



6. Comparison of Audit Types

Table 8.1 below summarises the results across all audits. The MSMP audit result shows only a slightly higher overall compliance rate than for the CMP audit. Extractive mines were slightly less compliant in the CMP audit than the MSMP audit. In contrast, the metalliferous mines scored considerably higher in the CMP audit than the MSMP audit. This may be because the larger metalliferous mines use contractors much more extensively than smaller extractive operations.

However, it is difficult to make a meaningful comparison between the MSMP and CMP audit results, with differences between the audit types in the number and depth of audit questions and the number of audited operations across the regions and operation types. The regions with comparable CMP and MSMP audit numbers were Cobar and South East.

Cobar operations were more compliant with MSMP audit requirements than the CMP audit, although operations in this region averaged the highest score in each of the audit types compared to the other regions.

The scores for the MSMP and CMP audits in the South East region were fairly even.

Table 8.1: Summary of mine safety audit results across audit types.

Percentage compliance with audit criteria					
Audit	**Region**	**Metals**	**Extractive**	**Other**	**Average**
MSMP Audit	Western	75.65	65.00	-	69.97
	Central West	73.46	74.07	81.16	74.09
	Cobar	94.94	-	-	94.94
	Northern	-	82.33	-	82.33
	Hunter	-	89.45	-	89.45
	South East	-	80.70	-	80.70
	Lightning Ridge	-	86.76	-	86.76
	Average	79.30	82.23	81.16	82.03
CMP Audit	Western	82.50	-	-	82.50
	Central West	87.50	78.21	-	81.00
	Cobar	91.00	-	-	91.00
	Northern	-	85.00	-	85.00
	Hunter	-	75.00	-	75.00
	South East	-	79.91	-	79.91
	Lightning Ridge	-	-	-	-
	Average (%)	88.89	79.33	-	80.41

7. Conclusion

The objectives of the audit program have been achieved.

The audit results indicate that while some mines are achieving a high level of compliance with the requirements in the MHS legislation for MSMPs and CMPs, many other mines are yet to comprehensively cover these requirements in their policy and procedure documents. This is reflected in the overall industry-wide averages achieved for both the MSMP and CMP audits.

The industry-wide averages for the MSMP and CMP criteria further indicate particular areas of low compliance across the industry as a whole. In general, the least compliant criteria in the MSMP audit dealt with emergency preparedness, SWMS, and hazards in the work environment.

The audited operations also did not score as highly as might have been expected in some areas that are fundamental to a risk-based approach to OHS. For example, the MSMP audit criteria testing reporting of hazards and workplace inspection, the identification of hazards, and assessing risks each scored less than 83%. The criteria testing the documented management structure also scored just over 80%, which was lower than might have been expected given the administrative nature of the requirement.

For the CMP audit, the criteria dealing with pre-engagement assessment, consultation and communication, monitoring of contractors, SWMS and contractor safety management plans all scored less than 80%. This indicates that many mines have yet to fully understand how to integrate contractors into the site OHS systems and practice.

The lack of integration of contractors into OHS systems at mining operations has been noted and discussed in previous mine safety reviews and many of the Wran report recommendations related to increasing focus on the inclusion of contractors in documentation and implementation of systems of work. The results of this audit may indicate that there is still some way to go before contractors are fully integrated into mining OHS systems, both in policy and implementation.

Part of the challenge in achieving a comprehensive integration of legislative requirements across the metalliferous and extractives sector is the range in nature and size of the operations. Mines in the sector range from small family owned quarries and single person opal claims to large underground mines run by multi-national companies, such as the metalliferous mines around Cobar. These larger operations would be expected to have more resources to put towards understanding the legislation and developing documents and systems within that framework. This seems to be reflected in the audit results with the Cobar region, which consisted of audits of large metalliferous mines, showing the highest compliance rates. However, all operators must be aware of the relevant legislative requirement and how they apply to a particular operation.

I&I NSW has been addressing this challenge through several initiatives such as publication of the Minerals Industry Handbook, the Small Mine Safety Management Kit, and the Risk Management Pocket Guide, Workshops and seminars on aspects of OHS have been conducted throughout NSW by MSOB inspectors and the Industry Assistance Unit from the Mine Safety Performance Branch. The Mine Safety Performance Branch is also conducting a statutory review of the MHS Act. The results of this audit program will be used for discussion and development of further initiatives focussing on less compliant areas of the MHS legislation in the metalliferous and extractives mining sector.

Feedback has already been provided to individual mines that took part in the audit program, but further feedback of the overall audit results will occur with consultation about future strategies to increase understanding and compliance with requirements. The less compliant operations will be provided with ongoing assistance and feedback on an individual basis. Enforcement action will be taken where required.

Due to legislative changes through the national OHS harmonisation and National Mine Safety processes, it may not be possible to make a direct comparison of these audit results with any future audits testing compliance with the new legislation resulting from the harmonisation process. However, as for the coal mines safety audit, this audit program has assisted audited operations to understand the process of documenting systems based on legislative requirements. The results form part of important baseline information that can be used to assess improvements in understanding, adoption and implementation of risk-based OHS in the mining industry.

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