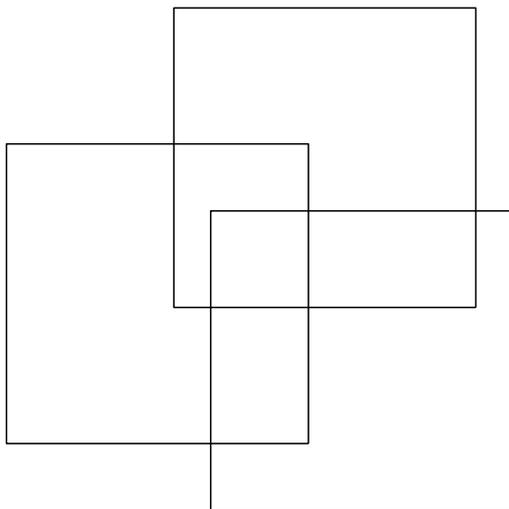




Final report

Meeting of Experts on Safety and Health in Opencast Mines
(Geneva, 16–20 October 2017)



MECPM/2017/6

INTERNATIONAL LABOUR ORGANIZATION

Sectoral Policies Department

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Geneva, 2017

INTERNATIONAL LABOUR OFFICE, GENEVA

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Introduction

1. The Meeting of Experts on Safety and Health in Opencast Mines was held in Geneva from 16 to 20 October 2017.
2. The Meeting was attended by eight experts from Governments, seven experts nominated by the Employers' group and seven experts nominated by the Workers' group of the Governing Body. In addition, 25 governments sent observers. There were also two observers from intergovernmental organizations and international non-governmental organizations. The purpose of the Meeting was to review and adopt a revised code of practice on safety and health in opencast mines, based on a draft prepared by the Office.

3. The Officers of the Meeting were:

Chairperson: Ms Elsbeth Akkerman (Government, Netherlands)

Vice-Chairpersons: Mr Al Hoffman (Government, Canada)
Mr Wayne John Reilly (Employer, Australia)
Mr Stephen Hunt (Worker, Canada)

4. The Chairperson observed that, following the closure of the thriving mining industry in the Netherlands in 1965, some 25 per cent of former miners suffered from silicosis and could not be cured due to lack of effective treatment. Such tragedies underlined the importance of the Meeting of Experts. A previous ILO code of practice on the topic had been adopted in 1991, but this was to be replaced by the new code. The new code would serve as a helpful tool for employers, workers, governments, and all others who wanted to improve safety and health in opencast mines.
5. The Secretary-General of the Meeting, Ms Alette van Leur (Director, ILO Sectoral Policies Department), observed that mining was a key sector for sustainable development. It contributed raw materials and building blocks for industrial activities. Decent work was placed at the heart of the 2030 Agenda for Sustainable Development. Sustainable development goal (SDG) No. 8 called for the promotion of inclusive economic growth and decent work for all. Mining also contributed to SDG 7 on Energy Access and Sustainability and to SDG 3 to “ensure healthy lives and promote well-being for all at all ages”. Mining could also contribute to environmental sustainability and to greater prosperity and social inclusion, which were major dimensions of the 2030 Agenda for Sustainable Development. Improving safety and health in mining would reduce injury rates, fatalities and associated economic costs to families and society. It would also contribute to sustainable economic growth, decent work, and a greener, healthier and fairer sector.
6. While great efforts over the years had given rise to better practices, there were many hazards that had not yet been fully eliminated or controlled. Practices varied greatly between and within countries. The purpose of the Meeting was to transform the draft code prepared by the Office into useful guidance for its intended users, providing practical information, inspiration and guidance to those engaged in opencast mining. ILO codes of practice were not legally binding, nor were they subject to ratification or supervisory mechanisms; but they were based on the full principles, rights and obligations set out in international labour standards, and were not to be understood as in any way detracting from those standards.
7. The Executive Secretary provided an overview of the draft code and its background. In developing the draft before the Meeting, the Office had sought to reflect the many changes in the industry since then related to the workforce, the roles of competent authorities and of

employers, workers and their organizations, and the development of new ILO standards, in particular the Safety and Health in Mines Convention, 1995 (No. 176). The Office used the 1991 code as a starting point and as the main reference for issues specific to opencast mining. The draft also drew on the 2006 *ILO code of practice: Safety and health in underground coalmines* in relation to issues that were critical to the mining industry as a whole. Elements from key ILO guidance on occupational safety and health (OSH) had been used. This included *Guidelines on occupational safety and health management systems* (ILO–OSH 2001). The draft aimed to ensure that the industry-wide move to OSH management systems and risk assessment was reflected. Risk assessment was highlighted as one of the key principles described at the beginning of the draft, and was reflected in the structure of the section on specific opencast mining hazards. All guidance under the chapter followed a format that encouraged users to think of control measures in the context of a risk assessment process. A number of topics not addressed in the earlier code, such as work at high altitudes, automated machinery or interactions between large-scale mining and small-scale miners, were also included in the draft code.

8. The Worker Vice-Chairperson observed that changes in the industry since 1991 needed to be reflected, while the draft should preserve important elements of the earlier code. The new draft code must provide an enforceable legislative and regulatory framework with specific requirements to which employers should adhere and which labour inspectors were able to readily audit. While the adoption of Convention No. 176 was a significant achievement, more needed to be done in view of the hazards of mining and the dangers of working in the industry. More workers in the sector had died of occupational diseases than in accidents. This would be reflected in the new text since, unlike the code of practice on underground mines, the new draft addressed various hazardous chemical and other agents that were the major cause of employment accidents in opencast mines. Despite advances in safety engineering and improvements in safety performance, hazardous conditions and serious and fatal injuries persisted. Over the previous nine years leaders in the industry had seen a more than 50 per cent reduction in annual injuries, and an equivalent drop in occupational diseases. However, there had been an increase in fatal injuries in the short term, requiring increased efforts by all stakeholders. Fatalities in underground mines mostly involved collapsed shafts, transportation, and energy supply issues, which together accounted for some 70 per cent of all fatalities reported by miners. “Underground operations” accounted for 45 per cent of fatalities, while “other processes” and “opencast operations” accounted for 30 per cent and 25 per cent respectively of reported fatalities in 2016.
9. The Worker Vice-Chairperson stated that the IndustriALL Global Union considered OSH to be a matter of workers’ rights, which included: (i) the right to know about the hazards of mining work and the right to appropriate training and education to operate safely within the industry; (ii) the right to refuse to perform or to curtail unsafe work without fear of repercussions; and (iii) the right to participate fully in health and safety policy development and implementation, including risk assessment. This last point would require effective joint health and safety committees and workers’ representatives selected freely by the workers themselves. More had to be done to maintain health and safety, particularly with regard to the ratification and implementation of Convention No. 176.
10. The Employer Vice-Chairperson considered that the draft text was sound in terms of risk control and prevention of injury in opencast mines. It did not substantially differ from national legislation or company standards. Some inconsistencies in risk management needed to be addressed within the draft’s structure. The sections on workers’ rights and risk management could also be improved. The role of competent authorities regarding guidance, information and advice could be improved for both employers and workers. The draft code was comprehensive and well-structured.

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11. The Government Vice-Chairperson stated that the sustainability of the mining industry was dependent on social responsibility, and on the standardization and appropriate regulation of health and safety. The draft text provided a good basis for discussion.

Consideration of the draft code of practice ¹

Introduction

12. Paragraphs 1 and 2 were adopted as drafted.
13. The Worker Vice-Chairperson proposed to replace “prevention and protective” in paragraph 3 by “prevention, protective, and corrective”. The amendment was adopted, and the paragraph was adopted as amended.
14. The Government Vice-Chairperson proposed to insert “and management” after “risk assessment” in the third line of paragraph 4. The amendment was adopted, and the paragraph was adopted as amended.

1. General provisions

1.1. Purpose

15. The section was adopted as drafted.

1.2. Objectives

16. The Government Vice-Chairperson proposed to add two further subparagraphs to the end of paragraph 1, to read as follows: “(d) to improve safety and health in the context of sustainable development; (e) the protection of local communities.”
17. The Employer Vice-Chairperson considered that the protection of local communities was not directly relevant to the purpose of the code. The first amendment was, however, acceptable.
18. Paragraph 1 was adopted with the addition of (d) above.
19. The Meeting returned to the second proposal at its final sitting. The Employer Vice-Chairperson proposed to replace “protection” by “health and safety”. This subamendment was adopted, and the amendment was adopted as subamended.
20. Paragraphs 2 and 3 were adopted as drafted.

¹ All references and numbers of sections etc. are to the original draft submitted to the Meeting.

1.3. Application

1.4. Reference to other ILO instruments

21. These sections were adopted as drafted.

2. General duties

2.1. Cooperation

22. Paragraph 1 was adopted as drafted.

23. The Worker Vice-Chairperson observed that, in relation to subparagraph 2(c), equipment provided by manufacturers was made according to the specifications given by the employer, but in the case of new chemicals, unforeseen hazards could occur. The subparagraph did not include workers. It should read: “manufacturers, suppliers and employers should provide workers [with all necessary information ...].”

24. The Employer Vice-Chairperson explained that subparagraph 2(c) was intended to emphasize manufactures’ and suppliers’ responsibilities. To address the Workers’ concerns, he suggested that “including providing relevant information about safety and health from the employer’s suppliers and manufacturers” be added to the end of subparagraph (a). The amendment proposed by the Employer Vice-Chairperson was adopted, and section 2.1 was adopted as so amended.

2.2. Competent authority

2.2.1. General provisions

25. The Government Vice-Chairperson proposed to insert a new first subparagraph 1(a), to read as follows: “(a) develop, maintain, and control the application of laws, regulations and standards on occupational safety and health in opencast mining;”.

26. The Employer Vice-Chairperson and the Worker Vice-Chairperson requested clarification regarding the standards intended.

27. The Government Vice-Chairperson explained that the reference was to recognized standards. New standards would require consideration of their applicability to existing contexts.

28. The Worker Vice-Chairperson proposed to subamend the proposed new subparagraph by adding “implement recognized” before “standards”.

29. The Employer Vice-Chairperson observed that competent authorities did not implement standards, but identified those that were relevant. The proposed reference to management systems seemed redundant.

30. The Employer Vice-Chairperson proposed to rephrase the proposed new subparagraph as follows: “develop, maintain, and control the implementation of national laws or regulations and incorporate these for occupational safety and health in opencast mines”.

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31. The Worker Vice-Chairperson thought this excessive. Any reference to “recognized standards” should be defined more accurately. The International Organization for Standardization’s (ISO) standards on OSH, for example, would not be acceptable.
 32. The Government Vice-Chairperson explained that the reference was to international standards such as those of the ILO.
 33. The Employer Vice-Chairperson observed that national governments did not always develop their own standards.
 34. The Government Vice-Chairperson proposed therefore that the new subparagraph read as follows: “(a) develop, maintain and control the application of laws and regulations on occupational safety and health in opencast mines and identify and incorporate accepted standards into these”.
 35. Returning to the discussion at its final sitting, the Meeting adopted the proposed new subparagraph as subamended by its author.
 36. The Government Vice-Chairperson further proposed to replace “OSH” at the end of the original subparagraph 1(a) by “to implement OSH management systems”. The Government expert from Indonesia, explaining the amendment, stated that OSH management systems were now the normative basis of all OSH policy, and embodied the principle that all parties must agree on their implementation. OSH policy-makers needed to be open to a wider set of considerations than OSH in isolation.
 37. The Chairperson observed that management systems were covered in section 3.2, and the amendment would perhaps be better placed there.
 38. The Employer Vice-Chairperson acknowledged that management systems were widely used. However, to state that they were the basis of OSH policy was misguided. A better solution would be to add to the original subparagraph 1(a) the words “including the promotion of a systematic approach to the promotion of OSH through management systems”.
 39. The Worker Vice-Chairperson observed that even with such systems, it was necessary to comply with national laws and regulations and international standards, and proposed to subamend the amendment by adding at the end “in accordance with national laws and regulations”. Regulators had to be satisfied that regulations were applied effectively. Management systems were commercial products, and were available “off the shelf”, but the term meant different things in different countries. Any new text should make it clear that management systems could be applied only subject to the application of national laws and regulations applied by the appropriate authorities. The Government Vice-Chairperson accepted this view.
 40. The Employer Vice-Chairperson thought it would be more appropriate in the new subparagraph to refer to the need for regulators to examine management systems, and for the competent authority to “establish provision in national regulations for employers to develop and maintain an OSH management system for the mine”.
 41. The Government Vice-Chairperson explained that the wording had now departed too far from the original intention of its author. The amendment was accordingly withdrawn.
 42. The amendment proposed by the Employer Vice-Chairperson, as subamended by the Worker Vice-Chairperson was however adopted. The subparagraph accordingly read: “devise and maintain a national policy on OSH, including the promotion of a systematic approach to OSH through OSH management systems in accordance with national laws and regulations;”.

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43. The Worker Vice-Chairperson proposed to insert after “limits” in paragraph 2 the words “, standards of competency and training for all workers”. The proposal was adopted.
 44. The Employer Vice-Chairperson proposed that “national laws and” be inserted before “regulations” in paragraph 2; and, since statutory provisions did not refer to procedures, but to processes, proposed that “procedures for consultation” be replaced by “process for consultation”. These proposals were adopted.
 45. Paragraph 2 was adopted as so amended.
 46. The Employer Vice-Chairperson proposed, in subparagraph 3(e), to insert before “machinery” the words “structures, facilities,”. The amendment was adopted. The paragraph was adopted as amended.
 47. The Employer Vice-Chairperson proposed to insert before the second sentence in paragraph 5 the following sentence: “The system of enforcement should be developed through a consultative process involving employers, workers, and workers’ representatives.”
 48. The Secretary-General observed that the usual wording in the ILO was “employers’ and workers’ representatives”. References to individual workers were not usually made.
 49. The Government Vice-Chairperson proposed also to include governments in the list of those consulted. The Worker Vice-Chairperson replied that governments’ role came after agreement between employers and workers. The competent authorities had to ensure that workers were not harmed.
 50. The Employers’ Secretary proposed that a footnote be added to provide the definition of workers’ representatives given in the Workers’ Representatives Convention, 1971 (No. 135).
 51. The paragraph was adopted as amended with the subamendment proposed by the Secretary-General and the inclusion of the footnote requested by the Employers’ Secretary.
 52. The Worker Vice-Chairperson observed that subparagraph 6(c) could lead to unintended discrimination and proposed to add at the beginning “Without discrimination, [... specify]”. The amendment was adopted and the paragraph was adopted as amended.

2.2.2. *Inspectorates*

53. The Government Vice-Chairperson proposed, in subparagraph 1(a), to replace “regulations at opencast mines” by “to implement OSH management systems in opencast mining”.
54. The Employer and Worker Vice-Chairpersons opposed the amendment, since the question of management systems had already been discussed. The amendment was withdrawn.
55. The Worker Vice-Chairperson proposed to add a new subparagraph 2(g) to read: “have access to all worker training records”. The Employer Vice-Chairperson considered that unqualified access was open to abuse. The Government Vice-Chairperson supported the amendment, since access was restricted to inspectors and was necessary for them to ascertain whether workers had been properly trained. The proposal was adopted.
56. The subsection was otherwise adopted without change.

2.3. Employers' responsibilities and rights

57. The Government Vice-Chairperson proposed that the hierarchy of controls proposed should read as follows:
- “(a) identify the hazard;
 - (b) assess the risk;
 - (c) eliminate the hazard;
 - (d) control the risk at source;
 - (e) minimize the risk by means that include the design of safe work systems;
 - (f) in so far as the risk remains, provide for the use of personal protective equipment (PPE).”
58. The Employer Vice-Chairperson observed that the proposed new (a) and (b) were not needed, since they were implicit in any risk assessment system. If such references were desired, they would be better placed in the introductory text of paragraph 1, which would then read: “In taking preventive and protective measures (control measures), subject to national laws and regulations, the employer should assess the risk and deal with it in the following order of priority:”. This was close to the original draft.
59. The Government Vice-Chairperson asked at what stage the employer would then identify the hazard. The Employer Vice-Chairperson accordingly subamended his text to incorporate “identify the hazard and” before “assess the risk”. The proposal was adopted and the paragraph was adopted as so amended.
60. The Employer Vice-Chairperson considered that the terms “what is reasonable, practical and feasible” and “due diligence” at the end of paragraph 1 required definitions. The employers’ duties were nowadays defined in terms of what was reasonably practicable and due diligence, and some wording was needed to reflect this. The phrase should be replaced by “reasonably practicable”, which was the more usual term in modern texts, since in some cases it was not practicable to eliminate all risks.
61. The Worker Vice-Chairperson considered that such definitions might be difficult, but agreed that “feasible” was redundant. However, the section as a whole largely reproduced Part III(A) of Convention No. 176, and the text should perhaps be left untouched to avoid confusion. The Government Vice-Chairperson considered that an agreed definition of “reasonably practicable” would be needed. At its final sitting the Meeting rejected the proposal and retained the original wording.
62. The Employer Vice-Chairperson proposed to replace “all necessary measures” in the first sentence of paragraph 2 by “reasonably practicable and feasible measures”. The Worker Vice-Chairperson reiterated that the section as a whole largely reproduced Part III(A) of Convention No. 176, and the text should be left untouched.
63. The Employers’ Secretary proposed that a footnote be added explaining that the reference to due diligence reflected the requirements of Convention No. 176. This proposal was adopted. As regards the rest of the subsection, if it was possible to improve on the wording of Convention No. 176, then the Meeting should do so.
64. The Secretary-General observed that, indeed, the section as a whole reflected the text of Part III(A) of Convention No. 176, with minor adjustments. Changes were possible, but if

the Meeting wanted to consider departing from that wording, it would be important that the experts would aim to avoid involuntarily promoting practices that might not be in line with the requirements of the Convention. Otherwise, member States using the guidance could find themselves adopting practices that could be in contradiction to the Convention and thus unwillingly create future barriers for ratification.

65. The Worker Vice-Chairperson emphasized that the final text must be usable, since workers' lives would depend on it. It was not a binding text, but some countries were desperate for practical guidance on how to improve OSH in mining.
66. The Government Vice-Chairperson proposed that the wording be reviewed after consideration of section 4 was complete. Definitions of "reasonably practicable" and "due diligence" could be added.
67. Consideration of this paragraph was postponed to a later stage. At its final sitting the Meeting also had before it two alternative suggested definitions of "reasonably practicable", which involved four bullet points, and a proposed definition of "due diligence".
68. The Government Vice-Chairperson stated that informal consultations had been held between the officers of the Meeting to discuss a definition of the term "reasonably practicable", but no agreement had been reached. He suggested to remove the word "feasible" as this was not consistent with either of the proposed definitions. The Government experts had not reached a consensus on the term "due diligence", on account of differences between jurisdictions and legal systems.
69. The Government Vice-Chairperson considered that paragraph 2 should be changed to bring it into line with the language used in paragraph 1: "... subject to national laws and regulation, employers should take all reasonably practicable measures to improve working conditions in opencast mining through implementing safety and health management systems and eliminate or minimize the risks to safety and health in opencast mines under their control, and in particular: ...".
70. The Employer Vice-Chairperson suggested that this text, while acceptable, would be better placed at the end of paragraph 1. Paragraph 2 should then start with "[H]aving regard to what is reasonable, practicable and feasible, and to good practice and the exercise of due diligence, subject to national laws, employers should do what is reasonably practicable [... to eliminate or minimize the risks to safety and health in opencast mines under their control, and in particular ...]".
71. The Worker Vice-Chairperson suggested that the opening of this amendment should refer to "what was reasonable action required to avoid, mitigate, or address potential and adverse impacts on the rights of health and safety of workers and others". This would be followed by the four bullet points in the proposed definition, since government laws and regulations may deal with issues other than mining. These items could include environmental regulation etc., and the managers of the mines would need to be aware of this distinction.
72. The Government expert from Germany said that the term "reasonably practicable" created problems for governments. When considering health and safety, economics should not be a consideration, and it was difficult to adequately describe "what was necessary" in this paragraph or define action needed in terms of cost.
73. The Employer Vice-Chairperson stated that laws and contracts were often purposely vague. The code was not a binding text and could not replace laws or regulations. It was intended to provide guidelines for employers and workers, rather than governments. All actions had an implied risk, but a practical code should explain in what circumstances it might be acceptable for a hazard not to be entirely eliminated based on a risk assessment. OSH issues

were not normally approached through criminal law. Hazards could not always be totally eliminated: they could only be mitigated within reason. As long as there were humans and not automated machines working in the industry, there would be risks. He hence supported the addition of a footnote, and proposed replacing the word “cost” in paragraph 4 by “implications”.

74. The Chairperson observed that while Convention No. 176 referred to “reasonable, practicable and feasible”, it did not define the terms.
75. The Worker Vice-Chairperson proposed, to accommodate the Government of Germany, that the reference to due diligence be qualified by “subject to national laws and regulations”. The Employer Vice-Chairperson was opposed to this proposal. Regulators made regulations; legislators made laws.
76. The Government Vice-Chairperson reiterated that no definition of “reasonably practicable” had been agreed among the Government experts. The Employer Vice-Chairperson accordingly suggested that the phrase might be reworded to read: “Employers should do what is reasonably practicable to take all necessary measures ...”.
77. The Worker Vice-Chairperson proposed instead that it read: “Employers should take the action required to avoid, mitigate or address potential adverse impacts on the rights, health and safety of workers and others, and in particular ...”.
78. After further reflection, the Employer Vice-Chairperson considered that some countries seemed to be approaching the code as a set of regulations, in which case he withdrew the proposed amendment.
79. The paragraph was adopted as amended.
80. The Worker Vice-Chairperson proposed to add the word “incidents” after “reasonably foreseeable industrial” in paragraph 3. There was a difference between an emergency and a disaster. The focus should be on emergency response, which was any incident that turned into an industrial emergency.
81. The Employer Vice-Chairperson supported the addition but noted that there was already a definition of industrial events. The Government Vice-Chairperson also supported the addition. The paragraph was adopted as so amended.
82. The Worker Vice-Chairperson proposed to add the word “illnesses” after “all accidents,” in subparagraph 5(d).
83. The Employer Vice-Chairperson stated that the reference should be to “occupational illness” as only illnesses related to the workplace called for investigation.
84. The Government Vice-Chairperson and the Worker Vice-Chairperson supported the proposal. The paragraph was adopted as so amended.
85. The rest of section 2.3 was adopted as drafted.

2.4. Workers’ rights and responsibilities

86. The Employer Vice-Chairperson suggested to add the words “and responsibilities” at the end of the introductory text of paragraph 1. The amendment was adopted.

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- 87.** The Worker Vice-Chairperson proposed to add “occupational illnesses,” after “to report accidents,” in subparagraph 1(a). The Employer Vice-Chairperson agreed with the addition and also proposed to add “near-miss events” after “... dangerous occurrences,” in subparagraph 1(a). These amendments were adopted.
 - 88.** The Worker Vice-Chairperson proposed to add “without fear of repercussion or discipline,” after “to remove themselves from any location at the mine,” in subparagraph 1(e). The Chairperson proposed that the term should be “disciplinary measures”. The amendment was adopted as so subamended.
 - 89.** The Employer Vice-Chairperson proposed to add the words “and responsibilities” at the end of the introductory text of paragraph 2. The Government Vice-Chairperson, on behalf of the observer from the Government of Morocco, noted that inspections and investigations were conducted by safety and health authorities. Workers only participated in, and did not conduct those inspections and investigations.
 - 90.** The Worker Vice-Chairperson agreed that workers did not have the authority to conduct investigations, but reiterated their right to participate. The Employer Vice-Chairperson supported the Workers’ view, provided that the workers participated as elected representatives.
 - 91.** The Government Vice-Chairperson reiterated that workers had no statutory authority. The Worker Vice-Chairperson further added that the aim was simply participation, not decision. The text clearly stated that it was subject to national laws and regulations and that it was the role of the competent authority to conduct inspections.
 - 92.** The paragraph was adopted with the amendment proposed by the Employers.
 - 93.** The Employer Vice-Chairperson proposed to add a new subparagraph after subparagraph 4(a) to read: “to present themselves at work in a fit for work state and to inform the employer of any changes in their fitness for work state”.
 - 94.** The Worker Vice-Chairperson disagreed, since if national laws and regulations made employers and managers responsible for workers’ health and safety, then they were also responsible for the workers’ fitness.
 - 95.** The Employer Vice-Chairperson asserted that it was the workers’ duty to report their state of fitness in terms of injuries, impairments, alcohol, drugs, etc. This was to ensure the safety of the worker and of other workers.
 - 96.** The Worker Vice-Chairperson pointed out that subparagraph 4(b) addressed the concerns of the Employers’ group.
 - 97.** The Government Vice-Chairperson agreed with the Employer Vice-Chairperson and added that the existing subparagraph 4(b) did not specify that workers had a duty to inform employers of their fitness.
 - 98.** The Worker Vice-Chairperson proposed that it was better to have a discussion on the issue in relation to section 12.3 on alcohol and drug testing.
 - 99.** The Employer Vice-Chairperson clarified that fitness included injuries, impairment, and fatigue, and was not limited to drugs and alcohol. Section 12.3 as drafted suggested that employers had to take full responsibility for drug and alcohol related issues: they should not be held responsible for every fitness-related issue on mining sites.

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100. The Worker Vice-Chairperson clarified that they were not suggesting that workers did not have to act mindfully at a mine site; it was necessary to avoid injuring themselves and others. They were willing to work in cooperation with the employers while ensuring that the rights of workers were guaranteed. He withdrew his opposition to the amendment proposed by the Employers. The amendment was adopted.
 101. The Employer Vice-Chairperson proposed inserting “, and to participate in the implementation of the occupational safety and health management system of the mine” at the end of subparagraph 4(d).
 102. The Worker Vice-Chairperson subamended the amendment to read: “and to participate with the safety and health committee in the development and implementation of the occupational safety and health management system of the mine”, to indicate that the safety and health system had to be developed and implemented jointly.
 103. The Employer Vice-Chairperson agreed with this rewording, since employers were required to consult workers on the issue. However, it was not necessary to include the word “committee”. The earlier formulation would have allowed any worker to participate.
 104. The Worker Vice-Chairperson observed that there were references to occupational health and safety committees throughout the document.
 105. The Employer Vice-Chairperson considered that the proposal meant that all workers should be able to participate in the development and implementation of the health and safety system. However, they would accept the use of the word “committee”.
 106. The Government Vice-Chairperson pointed out that quite often workers were called to sit in on safe work procedures, and may participate in their individual capacity and not as members of a committee. However, they would accept either formulation.
 107. The Employer Vice-Chairperson added that it was a very immature health and safety culture that required everything to go through a committee. A more evolved health and safety culture would include all workers.
 108. The Government Vice-Chairperson accepted the reference to a committee.
 109. The amendment was adopted as subamended, and the paragraph was adopted as so amended.
 110. The rest of the section was adopted as drafted.

2.5. General responsibilities of suppliers, manufacturers and designers

111. The Employer Vice-Chairperson pointed out that some sections of the code specified that national laws and regulations had to ensure that certain measures were taken. However, paragraph 1 stated that “measures should be taken” without specifying who was responsible.
112. The Executive Secretary stated that the provision was not intended as an employer’s responsibility, and proposed clarifying the sentence to refer to national laws and regulations, which could also include certification schemes.
113. The Employer Vice-Chairperson asked whether the laws and regulations would include safety in design and hazard studies for design programmes. He agreed with the proposal to include a reference to national laws.

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114. The Chairperson proposed to add “, including national laws and regulations,” after “Measures” to the introductory sentence of the paragraph. This change was adopted.
 115. The Government Vice-Chairperson proposed to add “and ensure that they meet appropriate and applicable standards and certification requirements” after “using them correctly” in subparagraph 1(a).
 116. The Worker Vice-Chairperson stated that it was not clear what was meant by certification requirements, and asked whether this was intended to include international standards.
 117. The Government Vice-Chairperson explained that he was referring to international standards with regard to the design and manufacture of equipment.
 118. The Employer Vice-Chairperson proposed a rewording: “and ensure that they meet appropriate and applicable standards or certification requirements”.
 119. The Government Vice-Chairperson agreed with the rewording and noted that some manufacturers might build to a standard but not test their products appropriately to meet certification requirements. The proposal was adopted.
 120. The Government Vice-Chairperson proposed to add, after “equipment” in clause 1(b)(ii), the following: “including the dangerous parts of machinery and hazardous components of equipment,”. The Worker Vice-Chairperson asked whether they were talking about something like a stored energy accumulator. The Government Vice-Chairperson explained that the reference was to stored energy accumulators and pinch points.
 121. The Employer Vice-Chairperson agreed with addressing pinch points and stored energy accumulators. Maybe the subparagraph should also include a reference to maintenance. There should be information about the correct set-up, use, and maintenance of the machinery, such as documentation by the original equipment manufacturers.
 122. The Secretary-General proposed to add a reference to maintenance in clause 1(b)(i): “... use and maintenance of machinery ...”. This proposal was adopted. The paragraph was adopted as amended.

2.6. General responsibilities and rights of contractors

123. The Employer Vice-Chairperson proposed to add a new subparagraph before 1(a), to read: “include the contractor performing a risk assessment, establishing risk controls for their work and submitting a workplan to the employer. The contractor should comply with the workplan and risk controls and inform the employer of any change.” While employers had to be responsible and follow rules, they should also go through the risk assessment and compliance process. There was only one OSH management system – that of the employer. It was hence the responsibility of the employer to include a requirement for contractors to submit the risk assessment in accordance with the OSH management system. The amendment was adopted and the paragraph was adopted as so amended.
124. The Worker Vice-Chairperson proposed, for the sake of consistency, to add “, including procedures to investigate accidents, occupational illnesses and dangerous occurrences” at the end of subparagraph 2(a). This proposal was adopted.
125. The Government Vice-Chairperson proposed to replace the text “commissioning party” by “employer in charge of the mine” in the introductory sentence of the paragraph. He also proposed the addition of a new subparagraph before 2(a), to read: “contractors have devised

a safety and health programme that has been approved by the employer in charge of the mine”.

126. The Employer Vice-Chairperson observed that the proposed new subparagraph created an additional requirement for employers. For consistency, the wording should be adapted, but he expressed doubts about the reference to a “safety and health plan”. He proposed accordingly to amend the beginning of subparagraph 2(b) to read: “the requirements of the mine OSH management systems, including training requirements [...]”. The new subparagraph could then read: “contractors develop a safety and health plan in accordance with the mine OSH management system that is approved by the employer in charge of the mine prior to commencing work”. For consistency “commissioning party” in existing subparagraph 2 should be replaced by “employer in charge of the mine to inspect work and ...”.

127. These proposals were adopted and the paragraph was adopted as so amended.

3. Occupational safety and health management systems; reporting, recording and notification of work-related injuries and diseases, ill health and dangerous occurrences; occupational health services

3.1. Introduction

128. The paragraph was adopted as drafted.

3.2. OSH management systems

129. The Government Vice-Chairperson, on behalf of the expert from the Government of the Russian Federation, proposed, in paragraph 2, to replace “hazard and risk assessment” by “hazard identification and risk assessment”. The Worker Vice-Chairperson expressed doubt about the addition of “identification” in this context. The Employer Vice-Chairperson suggested that it might be sufficient to say “hazard and risk management”.

130. The Worker Vice-Chairperson proposed the wording “hazard identification and control, and risk management”.

131. The Employer Vice-Chairperson agreed with the latter amendment, but thought it important to use consistent language throughout the code and hence to use the wording of section 4.2: “hazard identification, risk assessment and control”. This proposal was adopted.

132. The Government Vice-Chairperson proposed adding the text “including the collection of statistical data and conduct of assessments” at the end of subparagraph 2(e).

133. The Employer Vice-Chairperson noted that this was an additional responsibility for employers. He proposed to delete the word “statistical” from the amendment, as data had to be analysed in order to be statistical. This proposal was adopted and the paragraph was adopted as so subamended.

134. The section was otherwise adopted as drafted.

3.3. Reporting, recording and notification of work-related injuries and diseases, ill health and dangerous occurrences

135. The Employer Vice-Chairperson wondered whether the term “work-related injuries” or “occupational injuries” should be used. The paragraph was adopted as drafted.
136. The Employer Vice-Chairperson proposed to add a new sentence at the end of paragraph 2: “The competent authority should establish a nationally consistent approach to obtaining and reporting statistics on occupational accidents, injuries and diseases”. Federal states often had different national and provincial methods, and compensation authorities that provided statistics did so in a manner that was not always consistent at the national level.
137. The expert from the Government of the Russian Federation proposed to subamend this by replacing “... approach to obtaining ...” by “... approach to collecting ...”. This subamendment was adopted, and the paragraph was adopted as amended.
138. The Government Vice-Chairperson proposed to reword subparagraph 3(a) to read: “... occupational accidents and near-misses, occurrences and work-related diseases at facility and national level” after “... occupational accidents”.
139. The Employer Vice-Chairperson raised concerns about the consistency of several terms. He questioned whether the term “facility” referred to a “mine”.
140. The Executive Secretary clarified that the term “facility” could be replaced with “mine” and that “dangerous occurrences” included “near misses”. The Chairperson accordingly proposed that “facility” be changed to “mine” and that the text in subparagraph 3(a) be changed to “... about occupational accidents, dangerous occurrences, and occupational diseases at mine and national level”. This proposal was adopted, and the paragraph was adopted as so amended.

3.4. Occupational health services

141. The section was adopted as drafted.

4. Hazard identification, risk assessment and control

4.1. General principles

142. The Worker Vice-Chairperson proposed to replace “eliminate the risk” by “eliminate the hazard” in subparagraph 1(a). This was consistent with the principle that hazards had to be eliminated and risks controlled. The Employer Vice-Chairperson agreed that the amendment was more consistent and requested the Office to check consistency throughout the document.
143. The Government Vice-Chairperson proposed to reword subparagraph 1(a) as: “eliminate the hazard, including the replacement of hazardous equipment with safe installations and equipment”. The Employer Vice-Chairperson disagreed, as replacement was addressed in subparagraph 1(b) and examples of substitution could be added there. The term “safe” was subjective, and should be avoided.

144. The Government Vice-Chairperson accepted the Employers’ suggestion, and proposed to add the phrase “(e.g. replacing hazardous equipment or substances with less hazardous equipment or substances)” after “such as substitution”. This proposal was adopted, and the paragraph was adopted as so amended.

145. The section was otherwise adopted as drafted.

4.2. Hazard identification

146. The Government Vice-Chairperson proposed to add at the end of subparagraph 1(d) “including non-routine work”. The Employer and the Worker Vice-Chairpersons observed that language on non-routine work was referenced in 5.2. The amendment was withdrawn.

4.3. Risk assessment

147. The Government Vice-Chairperson proposed to replace the last sentence of paragraph 2 by “There are many established and recognized methods and techniques that can be implemented for the purpose of risk assessment.” The amendment was adopted and the paragraph was adopted as amended.

4.4. Risk control

148. The Government Vice-Chairperson proposed to add a sentence at the end of paragraph 1, to read: “In such cases such a risk should be controlled following the order of priority described in section 2.3, para. 1.” The amendment was adopted and the paragraph was adopted as amended.

4.5. Evaluation

149. This section was adopted as drafted.

5. Management of change

5.1. Managing change

150. This section was adopted as drafted.

5.2. Non-routine work

151. The Worker Vice-Chairperson proposed to delete the text in parentheses in 5.2.4(b). The amendment was adopted and the paragraph and section as a whole were adopted as amended.

6. Life-cycle approach

Concept

Design

Development/acquisition

Commissioning/implementation

Maintenance/modification

Decommissioning

Disposal

152. Introductory paragraphs 1 and 2, and these sections were adopted as drafted.

Operation (paragraphs 7 and 8)

153. The Government Vice-Chairperson proposed: (a) to add, at the end of paragraph 7, a new sentence: “The guidance in sections 9.1.3 to 9.1.6² on the development of mine plans, their updating and the recording of all relevant changes is particularly important in this phase”; and (b) to add a new paragraph to follow it: “Parts of the mine that are no longer in operation should at this stage be closed and rehabilitated.” In some countries rehabilitation began as soon as the decision to cease operating a section of a mine was taken.

154. The Employer Vice-Chairperson proposed that discussion on the first amendment be postponed until discussion of the related sections. Following that discussion, the amendment was adopted.

155. As regards the second, the Employer Vice-Chairperson observed that several contexts were possible: parts of a mine might simply not be in operation for the moment, but may return to operation later; in others, it might not be practicable to rehabilitate, especially in the case of opencast mines. He therefore subamended the proposal to read: “Parts of the mine that are no longer in operation should at this stage be closed or put into care and maintenance until decommissioned, if practicable.” The subamendment was adopted.

156. The paragraph was adopted as amended.

7. Emergency response plan

7.1. General emergency provisions

157. The Worker Vice-Chairperson proposed to add “workers,” after “in cooperation with” in paragraph 1. This amendment was adopted.

158. The Government Vice-Chairperson proposed to add after “should be established” in the first line of paragraph 1 “by the employer in charge of the mine”. This amendment was adopted.

159. The Employer Vice-Chairperson questioned the use of the terms “accidents or dangerous occurrences” in paragraph 1. It was preferable to retain the language chosen earlier, and amend the sentence to refer to “reasonably foreseeable industrial incidents and natural

² 10.1.3 to 10.1.6 in the final text.

disasters” and delete “and other issues”. These amendments were adopted, and paragraph 1 was adopted as so amended.

160. The Government Vice-Chairperson proposed to add a new subparagraph 3(a), to read: “establishing an emergency response team or brigade;”. This amendment was adopted.
161. The Employer Vice-Chairperson proposed to add after “control structures” in existing subparagraph 3(a), the words “, including roles and responsibilities;”. This amendment was adopted.
162. The Employer Vice-Chairperson proposed that, at the end of subparagraph 3(c), the words “including emergency contact details” should be added. This amendment was adopted.
163. The Government Vice-Chairperson proposed to add at the end of subparagraph (e) “including signings and markings indicating escape routes to be used”. This amendment was adopted.
164. The Government Vice-Chairperson proposed to add, after “retraining of [sic]”, in subparagraph (m), the words: “the training and appropriate retraining of all workers at an opencast mine who may be involved in an emergency”. The Employer Vice-Chairperson proposed to subamend this by adding “and any person” before “who may be involved”. This subamendment was adopted and the subparagraph was adopted as so amended.
165. The Employer Vice-Chairperson proposed to replace “oversee” by “monitor” in paragraph 7. The proposal was adopted.
166. The rest of the section was adopted as drafted.

7.2. Fire protection and firefighting

7.2.1. General provisions

167. The Employer Vice-Chairperson proposed to replace “exists” at the end of paragraph 1 by “has been identified” so as to imply the prior use of a risk assessment. This amendment was adopted and the paragraph was adopted as so amended.
168. Paragraphs 2 and 3 were adopted as drafted.

7.2.2. Precautions against fire

169. The Employer Vice-Chairperson proposed that the introductory sentence refer to both storage tanks and piping, since from his personal experience piping could also be a hazard if it contained flammable material. It should read: “All storage tanks and piping containing flammable or combustible liquids should be;” The amendment was adopted.
170. The Government Vice-Chairperson proposed to add a new subparagraph after subparagraph (a), as follows: “(b) marked to warn all persons that these contain flammable or combustible liquids;”. The amendment was adopted.
171. The Employer Vice-Chairperson observed that piping was not vented. Subparagraphs (d) and (e) should hence each begin with “all storage tanks containing flammable or combustible liquids should be ...”. The amendment was adopted.

7.2.3. Provision of fire protection

172. The Employer Vice-Chairperson observed that the section as a whole would benefit from a reference to the need for a prior risk assessment. He accordingly proposed that the words “Based on a risk assessment” be added at the very beginning of paragraph 1, and to delete “Among other places”. As a consequence, the word “all” in subparagraphs (d) and (e) were redundant and should be deleted. These amendments were adopted.
173. The Employer Vice-Chairperson further proposed that after “provided” at the end of that paragraph, the following should be added: “inspected, maintained and tested in accordance with manufacturers’ recommendations and regulations:”. While testing did not apply to fire extinguishers, the text would suffice. This amendment was adopted.
174. The Government Vice-Chairperson proposed that subparagraph 1(b) should refer not to grease alone, but should read: “where combustible and flammable material is stored;”. The Employer Vice-Chairperson observed that this might not be feasible in all cases, but accepted the proposal. The amendment was adopted.
175. The Government Vice-Chairperson proposed that subparagraph 1(c) be extended, after “workshops”, to refer to “kitchen facilities, living quarters, offices, or warehouses”; and to add a new subparagraph after 1(e) to read: “in any other place where a fire hazard exists as determined by a risk assessment”. These amendments were adopted.
176. The Employer Vice-Chairperson proposed that a new subparagraph be added as (f) to refer to “electrical switch rooms and distribution points;”. This amendment was adopted.
177. The rest of the section was adopted as drafted.

7.2.4. Firefighting and rescue

178. Paragraphs 1 and 2 were adopted as drafted.
179. The Government Vice-Chairperson proposed to add “and maintained at an easily accessible location” after “available” in paragraph 3. The amendment was adopted.
180. The Government Vice-Chairperson proposed that, similarly, paragraph 4 be extended to add “and all relevant information, including mine rescue plans, should be made available in a readily accessible place”. The Employer Vice-Chairperson proposed that the new text be in a separate paragraph, prefixed by “Provisions should be made to ensure”. The Government Vice-Chairperson observed that the new text should also specify to whom the information should be available, and proposed a reference to “ambulance staff”. The Worker Vice-Chairperson further amended this proposal to refer to “external emergency services”, which was adopted. The new text, as amended, was added as paragraph 5.
181. The rest of the section was adopted as drafted.

7.3. First aid and emergency medical services

7.3.1. First-aid requirements

182. The Government Vice-Chairperson proposed that subparagraph 2(b) should refer to “sufficient first-aid attendants” and that, at the end of the subparagraph, the following be added: “and their contact details should be easily available”. The Employer Vice-

Chairperson observed that in small mines a single such official was the norm, but he accepted the amendments, which were adopted.

- 183.** The Government Vice-Chairperson proposed that paragraph 4 specify that the first-aid register should be available to the competent authority. The Employer Vice-Chairperson observed that this might give rise to issues of confidentiality. The Government Vice-Chairperson proposed therefore to add “or other authorized persons”. The Employer Vice-Chairperson observed that a simple reference to “authorized persons” would suffice.
- 184.** The Government expert from the Russian Federation proposed that instead of “women and men” in paragraph 4 a simple reference to “persons” would suffice. The Worker Vice-Chairperson proposed that the text refer to “workers”. The Employer Vice-Chairperson noted that the issue did not concern the status or representation of those faced by the hazard, but all persons on the site, including visitors. The text should hence refer to “persons”.
- 185.** He further proposed that an abstracted version of the register, with the names of individuals removed, could be provided for accident analysis. The last sentence of paragraph 4 should hence be replaced by the following: “The register should only be accessible to authorized persons. The register may be made available, excluding confidential information, to a competent authority and the safety and health committee for the purposes of incident and injury analysis.” This amendment was adopted. As regards the use of the term “women and men”, the Meeting considered that it was preferable for the text to consistently refer to “persons” where people in general were concerned. It was so decided.
- 186.** The rest of the subsection was adopted as so amended.

7.3.2. First-aid training

- 187.** The Employer Vice-Chairperson proposed to reword paragraph 1 as “Based on a risk assessment and in compliance with national laws, there should be a suitable number of first-aid attendants holding recognized first-aid certificates.” Not all supervisors held first-aid certification. First-aid certification could be held by a worker within a team. It was more logical to base this on a risk assessment due to differences in the nature, location and challenges of the work. Not all persons in supervisory positions had to be certified.
- 188.** The Government Vice-Chairperson proposed to add “and current” after “recognized” to account for the possibility of individuals holding expired first-aid certification. The Worker Vice-Chairperson suggested to use the term “valid” and observed that “valid” included the concept of “current”. The Employer Vice-Chairperson and Government Vice-Chairperson supported the use of “valid”.
- 189.** The Worker Vice-Chairperson proposed to add “in every mine” at the end of paragraph 1 in order to underscore that the paragraph included all mines, including small mines. Paragraph 2 could then be deleted. These proposals were adopted, and the subsection was adopted as so amended.

8. Specific hazards

8.1. Hazardous substances

- 190.** The Employer Vice-Chairperson proposed that the title of the section be changed to “Hazardous substances and atmospheres” as both items were discussed in the section. This amendment was adopted. He further proposed to add “, including withdrawal procedures.”

at the end of paragraph 3. The Worker Vice-Chairperson noted that “withdrawal” was not a recognized term and proposed to replace it by “evacuation” for the purpose of clarity. This proposal was adopted. The rest of the section was adopted as drafted.

8.1.1. Chemicals in the workplace

8.1.1.1. Hazard description

- 191.** The Employer Vice-Chairperson proposed to add “... an element” after “A chemical substance is ...” as some elements could also be a chemical hazard. The proposal was adopted.
- 192.** The Worker Vice-Chairperson proposed to add “with or without any latency period” at the end of the first sentence of paragraph 2. There were cases of both immediate reactions and late onset reactions after exposure to hazardous materials including asbestos, certain heavy metals and silica. It was important to raise awareness that damage from hazardous exposures was not always immediate and could take a long time to appear; even brief exposure to certain hazards was dangerous, as in the case of black lung disease. The amendment was adopted.
- 193.** The Government Vice-Chairperson asked the Office to explain the use of the terms “chemicals” and “chemical substances”. He proposed to add a new paragraph 3, to read: “Chemical vapours can also present an explosive hazard in the workplace.” The Worker Vice-Chairperson proposed that this addition be integrated at the end of paragraph 1.
- 194.** The Executive Secretary explained that “chemicals” and “chemical substances” were used interchangeably. No change was made to the text in this regard.
- 195.** The Employer Vice-Chairperson noted that gas included vapours, and chemical gases were not the sole explosive fire hazard. Therefore, the amendment should be reworded as: “Chemical substances can also present a fire or explosive hazard in the workplace.”. The subamendment was adopted and the paragraph adopted as amended.
- 196.** The rest of the subsection was adopted as drafted.

8.1.1.2. Assessment of risk

- 197.** The Worker Vice-Chairperson proposed to reword the first sentence of paragraph 4 as “Labels should, as a minimum, be posted and meet ...”. The Employer Vice-Chairperson expressed his doubts about the use of the word “posted”. The Worker Vice-Chairperson explained that in many countries it was not feasible to get access to electronic versions of data sheets. The proposed amendment would ensure that safety information was readily available to all.
- 198.** The Employer Vice-Chairperson observed that paragraph 4 referred exclusively to labels. The Worker Vice-Chairperson withdrew his amendment on the understanding that its import was covered by paragraph 3 of 8.1.1.3.1. The Employer Vice-Chairperson noted that paragraph 5 referred to a code of practice that covered safety data sheets (SDS) and labels and would address the concerns raised by the Workers’ group.
- 199.** The Government Vice-Chairperson asked whether SDS was an appropriate term or if it should be replaced with MSDS (material safety data sheet).
- 200.** The Executive Secretary explained that SDS were the international form of the MSDS. While MSDS existed in multiple formats, SDS were published in only one format. The

Globally Harmonized System of Classification and Labelling of Chemicals (GHS) referred to SDS.

201. The Government expert from Namibia proposed to replace the word “phrases” with “instructions” in subparagraph 4(b). The Worker Vice-Chairperson pointed out that “phrases” was a term and concept used in the GHS. The amendment was withdrawn.

202. The paragraphs were adopted as drafted.

8.1.1.3. Control strategies

8.1.1.3.1. *Training and information*

203. The Employer Vice-Chairperson proposed to replace “miner” with “worker” in subparagraph 3(iv). The Executive Secretary stated that “worker” was more usual. The amendment was adopted.

204. The Government Vice-Chairperson proposed the addition of a new subparagraph in paragraph 3, to read: “all forms of signals, signs, and other forms of warning”.

205. The Worker Vice-Chairperson proposed to combine the addition in clause 3(a)(ii) of paragraph 3 to read: “all forms of signals, signs, labels and other forms of warning”. This proposal was adopted.

206. 8.1.1.3.1 on training and information was otherwise adopted without change.

8.1.1.3.2. *Hazard control*

207. 8.1.1.3.2 on hazard control was adopted as drafted.

8.1.2. **Inhalable substances**

8.1.2.1. Hazard description

208. The Employer Vice-Chairperson proposed to change the header of subsection 8.1.2 to read: “Inhalable and respirable substances” as there was an important difference between the two, for example with regard to silicosis. The amendment was adopted.

209. The Worker Vice-Chairperson proposed to use the word “cancers” instead of “lung cancer” in the second sentence, as many airborne substances caused other cancers. The amendment was adopted.

210. The Government Vice-Chairperson supported this amendment and proposed to add “including silicosis” in line 2 after “pneumoconiosis”. The amendment was adopted.

211. With regard to a query by the Worker Vice-Chairperson whether “pulmonary system” was equivalent to “lungs”, an Employer expert stated that from a medical point of view “the pulmonary system” referred exclusively to the lungs.

212. The paragraph was adopted as amended.

8.1.2.2. Assessment of risk

213. These paragraphs were adopted as drafted.

8.1.2.3. Control strategies

8.1.2.3.1. *Dusts*

- 214.** The Employer Vice-Chairperson proposed to replace the word “airborne” with “inhalable and respirable”, and replace “dust” with “dusts” in paragraph 1. The Government Vice-Chairperson asked whether that change would exclude explosive dusts, as found in coalmining. The Employer Vice-Chairperson proposed to monitor whether other sections applied to coal dust and other explosive dusts as the Meeting worked through the text. The Chairperson noted that this should be monitored. Paragraph 1 was adopted as amended.
- 215.** The Employer Vice-Chairperson proposed that the words “In the immediate period following blasting operations” be converted into a new subparagraph (a). The amendment was adopted and paragraph 2 was adopted as amended.
- 216.** The Employer Vice-Chairperson proposed to insert: “Based on an exposure assessment or monitoring,” at the beginning of paragraph 3: an opencast mine could become so deep that hazardous atmospheres developed and mechanical ventilation was not adequate. Therefore, mechanical ventilation in general should be based on a proper assessment and/or monitoring.
- 217.** The Worker Vice-Chairperson recalled the 2006 Kimberley accident in British Columbia, where no one had expected contaminated air or insufficient ventilation in a shed. The Government Vice-Chairperson observed that, at Kimberley, oxygen-depleted air from a recently covered nearby dump had flowed into the bottom of the shed through a water-intake pipe, and four people had died as the oxygen had depleted at the bottom of the shed. The problem had not been identified in the risk assessment carried out previously.
- 218.** The Employer Vice-Chairperson observed that the text did not include any system of risk control that could have applied to the Kimberley incident. The victims had unwittingly assumed that ventilation was adequate in the shed, but the accident could nevertheless have been prevented. The text had not described such an eventuality, but had jumped to specific control measures by providing for ventilation everywhere. The code needed to be predictive, and assessment programmes were broad. There was a need to establish whether there were hazardous substances in the air and whether air was breathable.
- 219.** The Employer expert from Guatemala stated that agreement on this point was important: the text could address ventilation in a broader manner.
- 220.** The Worker Vice-Chairperson proposed to replace the word “or” by “and” between the words “assessment” and “monitoring” in paragraph 3, since assessing risks entailed identifying areas to monitor. The employer could not place ventilation everywhere, but it was necessary to ensure safe access to areas where work was to be performed.
- 221.** The Employer Vice-Chairperson accordingly proposed adding the phrase “Based on hazard identification, exposure assessment and monitoring” at the beginning of paragraph 3. This amendment was adopted and paragraph 3 was adopted as so amended.
- 222.** The Government Vice-Chairperson proposed an additional paragraph between paragraphs 3 and 4 to read: “Dust suppression using water and/or surfactants should be implemented where practicable”. The Employer Vice-Chairperson subamended this to read: “Methods such as dust suppression using water and/or surfactants, extraction or filtering should be implemented where practicable.” The subamendment was adopted. The proposed new paragraph 4 was adopted as so amended.
- 223.** The Government Vice-Chairperson proposed to insert the phrase “an acceptable” before the word “level” in subparagraph 4(a). This proposal was adopted.

224. He further proposed to insert the word “, labels” after the word “signs” and the word “warning” before the word “notices” in subparagraph 4(d). The Employer Vice-Chairperson subamended the amendments, proposing that it should read: “use signs, labels and other warnings” as “warning notices” could be understood as a general warning throughout the mine, while “other warnings” would be more flexible. The amendment was adopted as subamended and the new paragraph was adopted as amended.

225. The rest of the section was adopted as drafted.

8.1.2.3.2. *Other inhalable substances*

226. Following a query by the Worker Vice-Chairperson, the Executive Secretary corrected paragraph 2 to refer to the section on confined spaces.

227. The Government Vice-Chairperson proposed to add at the end of paragraph 4: “If these controls cannot meet applicable exposure limits, PPE should be used as a last resort”. The Employer Vice-Chairperson proposed that the idea would be better reflected by adding “should be applied, including PPE where absolutely necessary” after “controls” at the end of the first sentence, since this would fit better into the hierarchy of controls already established. This latter amendment was adopted.

228. Section 8.1.2 was otherwise adopted as drafted.

8.1.3. *Radiation*

8.1.3.1. *Hazard description*

229. The Employer Vice-Chairperson stated that, while the text was not perfect, and was perhaps over-academic in places, it would suffice.

230. The Worker Vice-Chairperson agreed: better examples were available, such as that published by the Radiation Exposure Services of the Radiation Safety Institute of Canada, which had come into being following the tragedy in which at least 220 miners in Elliot Lake, Ontario, had died of lung cancer from years of exposure to radon in the town’s uranium mines.

231. The Government Vice-Chairperson supported this view: a balance was needed between scientific accuracy and comprehensibility, and that a reference to the work of the Radiation Safety Institute of Canada might be a very useful addition to the bibliography. The Employer Vice-Chairperson and Government experts supported this view.

232. The section was adopted as drafted.

8.1.3.2. *Ionizing radiation*

8.1.3.2.1. *Assessment of risk*

233. The Government Vice-Chairperson proposed to add “on-site transportation” after “mining” in subparagraph 1(a). The amendment was adopted and 8.1.3.2.1 was adopted as so amended without further change.

8.1.3.2.2. *Control strategies*

234. The Employer Vice-Chairperson considered that the section was poorly drafted and inconsistent and would benefit from some reordering. The controls were not in a logical

sequence and were overly complex. Strong wording was needed on proper monitoring and assessment controls, both by engineers and administrators. The examples seemed limited to dust, yet some radioactive substances were gases, such as radon, while zircon was a crystal solid.

- 235.** The Worker Vice-Chairperson supported the Employers' view. The text was overly scientific for a code of practice and more concrete examples of practice would have been helpful. The problem derived from the fact that the effects of radiation exposure were not immediately perceptible.
- 236.** The Government Vice-Chairperson expressed support for either a rewrite of the section or the inclusion of a reference to an appropriate standard or some other guidance documents. He proposed to add, after "radiation protection" in the third line of paragraph 2, and after "safety specialist" in the sixth line, the words "or other competent and authorized persons". Such roles should not be limited to industrial hygienists as, in some jurisdictions, qualified engineers or radiation physicists also took on such responsibilities. The proposal was adopted.
- 237.** The Worker Vice-Chairperson proposed to add "without loss of pay" in 2(d)(v) after "job rotation". The Employer Vice-Chairperson proposed to expand the concept and refer to "without penalty" and to add afterwards in parentheses "(for example no loss of pay)". This proposal was adopted.
- 238.** 8.1.3.2.2 was otherwise adopted without change.

8.1.3.3. Non-ionizing radiation

8.1.3.3.1. *Assessment of risk*

- 239.** The Government Vice-Chairperson considered that ionizing and non-ionizing radiation should be treated in a consistent manner. He therefore proposed that the first two paragraphs of 8.1.3.2.2, as amended, should be repeated at the outset of 8.1.3.3.2. This proposal was adopted. The paragraphs were otherwise adopted without change.

8.2. Electric and magnetic fields

- 240.** The Employer Vice-Chairperson considered that the reference to "some studies" in paragraph 1 left the text ambiguous. There was a lack of consistency in the text: some hazards were described succinctly and practically, others academically.
- 241.** The Government Vice-Chairperson agreed. The text did not seem to follow the same structure as previous sections, nor were there any references to specific exposure limits. He asked whether exposure limits were within the scope of the discussion, or whether the reference to the ILO document *Protection of workers from power frequency electric and magnetic fields: A practical guide* (ILO Occupational Safety and Health Series No. 69, Geneva 1994), which contained exposure limits, was sufficient.
- 242.** The Secretary-General emphasized the importance of convening a meeting of experts for the purpose of improving the draft code of practice, and encouraged the parties to make all necessary additions and amendments. The document should be useful at a practical level and references to more elaborate documents could be included.
- 243.** The Government Vice-Chairperson agreed to paragraph 5 as drafted, but asked whether it would be possible to come to some agreement on the use of exposure limits.

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244. The Worker Vice-Chairperson stated that there were a myriad of different exposure limits in different countries. The references to “competent authorities” as those responsible for determining exposure levels throughout the text were hence appropriate. Governments should ensure that the highest level of protection for workers was established.
245. The Employer Vice-Chairperson stated that if documents and instruments were quoted, the exact exposure levels and limits that they offered should be specified. The draft code of practice was not perfect, but there was no need for excessive zeal in perfecting it.
246. The Government spokesperson requested that the record reflect the shared view that specific standards should be considered by an ILO meeting at some point in the future.
247. The section was adopted as drafted.

8.3. Stored energy

8.3.1. Hazard description

248. The Government Vice-Chairperson proposed that, after “hydraulic” in paragraph 2, the following be added: “and other gas or steam”. The amendment was adopted. The subsection was otherwise adopted without change.

8.3.2. Assessment of risk

249. The subsection was adopted as drafted.

8.3.3. Control strategies

250. The Employer Vice-Chairperson proposed that a new subparagraph be added after 2(a), to read: “suitable guarding or enclosure of equipment or components that can unexpectedly release energy;”. The proposal was adopted.
251. The Employer Vice-Chairperson proposed that a new subparagraph be added at the end of paragraph 2 to refer to “regular inspection and maintenance of equipment or components that contain or store energy”.
252. The Worker Vice-Chairperson observed that this section should apply to piping that had frozen and was liable to explode if used without thawing. Some reference was needed to blocking off tailing pipes for this purpose in a new subparagraph at the end of paragraph 2, which should read: “actuators and pressure vessels should be regularly certified and tested in accordance with the manufacturer’s instructions”. The Government Vice-Chairperson proposed that certification should also be mentioned. The Employer Vice-Chairperson was dubious about certification in this context, since it was time-consuming and the issue was more a matter of legislation, and therefore proposed to combine the two proposals as a new subparagraph 2(i) to read: “equipment or components that contain or store energy, including pressure vessels, actuators, and pipes, should be maintained and inspected in accordance with manufacturers recommendations and relevant laws.” This latter proposal was adopted.
253. The Employer Vice-Chairperson proposed that the words “the operator should” be deleted at the beginning of subparagraph 3(b). This amendment was adopted.

254. The Worker Vice-Chairperson proposed to add a new subparagraph at the end of paragraph 3 to read: “(e) where there is a potential for fluid release, the pipeline should be blanked off” to bring it into line with the previous amendment. This proposal was adopted.

255. The Employer Vice-Chairperson proposed, also to reflect the earlier amendment, to add a further subparagraph at the end of paragraph 3, to read: “(f) steps to safely re-energize and reinstate equipment to operational status”. This amendment was adopted.

256. The subsection was otherwise adopted without change.

8.4. Noise

8.4.1. Hazard description

8.4.2. Assessment of risk

257. These sections were adopted as drafted.

8.4.3. Control strategies

258. The Government Vice-Chairperson proposed to add, after “organizational measures” in subparagraph 7(b), the words “such as job rotation”. This proposal was adopted.

259. The Government Vice-Chairperson proposed to add a new subparagraph after subparagraph 7(b), to read: “designate specific areas with high noise levels and install appropriate warning signs indicating that hearing protection is mandatory”. The proposal was adopted.

260. The Government Vice-Chairperson proposed that the reference in paragraph 8 should be to “initial and further” regular audiometric testing. The Worker Vice-Chairperson supported the proposal and proposed also to replace “every two years” by “annually”. These proposals were both adopted.

261. The Government Vice-Chairperson proposed, at the end of subparagraph 9(b), to replace “especially for young workers” by “especially for young, pregnant and older workers”. The Worker Vice-Chairperson considered that noise affected all people, and no special cases were warranted. Instead, the terms “especially for young workers” should be deleted. The Employer Vice-Chairperson supported the Workers’ proposal, observing however that the Employer experts were not aware of noise causing problems for pregnancies. The Worker Vice-Chairperson preferred in that case to delete the phrase “especially for young workers”. This proposal was adopted.

262. The subsection was otherwise adopted without change.

8.5. Vibration

8.5.1. Hazard description

263. The Government Vice-Chairperson proposed to replace “transport” by “vehicles” in subparagraph 1(a). The proposal was adopted. The subsection was otherwise adopted without change.

8.5.2. Assessment of risk

264. The Government Vice-Chairperson proposed to add “, machinery” after “vehicles” in subparagraph 1(c). The proposal was adopted. The subsection was otherwise adopted without change.

8.5.3. Control strategies

265. The Employer Vice-Chairperson proposed to add a new sentence at the end of paragraph 5, to read: “Consideration should be given to jolt and jar effect in certain types of mobile equipment, for example bulldozers while ripping hard, rocky earth.” The Worker Vice-Chairperson warmly welcomed the suggestion, based on personal experience. The proposal was adopted. The subsection was otherwise adopted without change.

8.6. Heat and cold stress

8.6.1. Hazard description

8.6.2. Assessment of risk

266. These sections were adopted as drafted.

8.6.3. Control strategies

267. The Government Vice-Chairperson considered that, where an assessment showed that unhealthy or uncomfortable conditions had arisen from increased air temperature, the employer should implement means to reduce air temperature, which may include ventilation or air cooling. He therefore proposed to add a new sentence at the end of paragraph 2: “If no other controls can mitigate the risk, PPE such as cooling jackets should be provided.”. The amendment was adopted, and the subsection was otherwise adopted without change.

8.7. Fatigue

8.7.1. Hazard description

268. The Employer Vice-Chairperson proposed to add at the end of subparagraph 1(f) “for example a medical condition, illness, disease or personal factors such as stress, anxiety, etc.”. The Employer Vice-Chairperson proposed to replace the words “non-work related” by “individual”. The Worker Vice-Chairperson observed that such conditions were often work-related, but would not oppose the amendment. This subamendment was adopted and the amendment was adopted as subamended.

269. The Government Vice-Chairperson enquired whether the definition of “dangerous occurrences” included fatal and serious accidents, as was the case in Canada. He accordingly proposed to add “fatal or serious accidents” after “dangerous occurrences” in paragraph 2. The Employer Vice-Chairperson noted that serious accidents included fatal ones, and hence proposed to remove “fatal”; this subamendment was adopted, and the amendment was adopted as so subamended.

270. The Employer Vice-Chairperson proposed to replace “lead to” in paragraph 2 by “be a contributing factor to”, and to redraft the remainder of the paragraph to read: “... because

workers may not be alert or able to quickly respond to changing circumstances. In addition, prolonged fatigue can lead to long-term health problems”. All these proposals were adopted.

271. The Government Vice-Chairperson proposed to add a new subparagraph to follow 3(c), to read: “the design of work stations and the environment in which work is performed”. The Employer Vice-Chairperson proposed that it refer to “ergonomic” design. The amendment was adopted as so subamended.

272. The Employer Vice-Chairperson observed that the section was far from perfect: factors more properly included in risk assessment were now included in hazard descriptions. Further work on this section should be considered if time permitted.

273. The subsection was otherwise adopted without change.

8.7.2. Assessment of risk

274. The subsection was adopted as drafted.

8.7.3. Control strategies

275. The Government Vice-Chairperson proposed, in paragraph 1, to delete “auditable”, to replace “plan” by “programme”, and after “operations” to add: “and in accordance with national laws”. The Worker Vice-Chairperson observed that the last suggestion would not apply in countries that had no such legislation and proposed use of the term “where applicable” before “in line with national laws and regulations”. The Employer Vice-Chairperson proposed instead to add “if national laws prescribe”. The latter subamendment was adopted, and the proposal by the Governments was adopted as so subamended.

276. The Government Vice-Chairperson proposed to add, in the last line of paragraph 2 after “times”, the phrase “as well as on-site living quarters”. The Worker Vice-Chairperson supported this proposal, since it would reduce commuting time. The Employer Vice-Chairperson replied that this was not always the case and that a better wording might be: “as well as the suitability of employer-provided accommodation”. This latter proposal was adopted. The subsection was otherwise adopted without change.

8.8. Work at high altitudes

8.8.1. Hazard description

277. The Employer Vice-Chairperson requested the Office to check the Spanish translations of the medical acronyms in this section. He proposed to insert “, or fluid in the brain” after “high-altitude cerebral edema (HACE)” in the second sentence of paragraph 4. The proposal was adopted.

278. The subsection was adopted as amended.

8.8.2. Assessment of risk

279. The subsection was adopted as drafted.

8.8.3. Control strategies

280. The Worker Vice-Chairperson proposed to delete subparagraph 1(a) as it was futile to conduct medical examinations when there were “no reliable medical criteria to predict an individual’s capacity for high-altitude work”. After consultation with the other Employer experts, the Employer Vice-Chairperson proposed to delete only the second sentence of subparagraph 1(a) and retain the first. It was important that people were examined for pre-existing conditions such as high blood pressure. The proposal was adopted, and the subsection was adopted as so amended.

8.9. Tailings dam failure

8.9.1. Hazard description

281. The Government Vice-Chairperson proposed to amend the title to read: “Tailings dams and lagoons”; and to add “and lagoons” after “dams” in the first line of paragraph 1. The use of the term “failure” was not acceptable to several governments. Subsection 8.9.4 on lagoons could then be deleted. The proposal was adopted and the subsection was adopted as amended.

8.9.2. Assessment of risks

282. The Worker Vice-Chairperson proposed to add “and overproduction of tailings;” at the end of subparagraph 4(a). The proposal was adopted and the subsection was adopted as amended.

8.9.3. Control strategies

8.9.3.1. Design

283. The Worker Vice-Chairperson proposed to add “workers and” after “health of” in paragraph 3. The paragraphs were adopted as amended.

8.9.3.2. Construction

284. The paragraphs were adopted as drafted.

8.9.3.3. Operation

285. The Employer Vice-Chairperson proposed to insert two new paragraphs after paragraph 5. The first would read: “Workers and other persons who work at or near tailings dams should be trained in the hazards and how to identify and report signs of failure or changing conditions that could present a risk.” The second would read: “There should be action plans in place that are activated and implemented where there are signs of failure or changing conditions identified through monitoring or reporting by workers.” This would help avoid disasters. These proposals were adopted and the subsection was adopted as amended.

8.9.3.4. Decommissioning

286. The paragraphs were adopted as drafted.

8.9.3.5. Management of cyanide

287. The Employer Vice-Chairperson proposed to add, after “highly toxic and” in paragraph 1, the following: “can accumulate in the human body, plants and animals, and”. The proposal was adopted.

288. The Government Vice-Chairperson proposed to amend subparagraph 8(a) to read: “amounts and concentration of planned and accidental possible discharge from a processing plant to the tailings dam”; to replace “wildlife” by “environment” in subparagraph (b); and to delete subparagraphs (c), (d) and (e).

289. The Employer Vice-Chairperson disagreed with the amendments proposed for subparagraphs (b), (c), (d) and (e), as surface waters, groundwater and animals could get contaminated and could transfer cyanide to people. The word “wildlife” should be retained for countries where wildlife was consumed. The subparagraphs should rather be reworded as follows:

“(a) amounts and concentration of planned and accidental possible discharge from a processing plant to the tailings dam;

(b) exposure of and impact on wildlife;

(c) contamination of surface waters;

(d) contamination of the groundwater;

(e) exposure of and impact on livestock and domestic animals; and

(f) exposure of human populations.”

The proposal by the Employer Vice-Chairperson was adopted.

290. The Employer Vice-Chairperson observed that the impact of cyanide could be either direct or indirect and that the risk involved was not the possible death of wildlife or plants, but rather exposure, and he therefore proposed to add an unnumbered sentence below subparagraph (f) that read: “Exposure to cyanide can occur either directly or indirectly, for example through human consumption of animals, plants and water that have been exposed”. This proposal was adopted.

291. The Worker Vice-Chairperson proposed to add “reduction or elimination of the risks of cyanide exposure to people” as a new subparagraph 9(a), as the cyanide risk controls included animals but did not mention people. This proposal was adopted.

292. The Employer Vice-Chairperson proposed to add a new paragraph 10 that would read: “Further information on the management of cyanide is detailed in the International Cyanide Management Code. This proposal was adopted.

293. The paragraphs were adopted as amended.

8.9.3.6. Emergency response plan

294. The Government Vice-Chairperson proposed to add “through the completion of a formal dam burst inundation study” at the end of subparagraph 1(a). This proposal was adopted.

295. The Employer Vice-Chairperson proposed to add “engagement with local communities that may be affected by the emergency response plan and provisions, including implementation

of alarms and/or warning systems” as a new subparagraph (b); and proposed to add “and in the community as necessary” after “personnel on-site” in subparagraph (d). These proposals were adopted. The paragraph was adopted as amended.

8.9.3.7. Reporting of dangerous occurrences

296. The paragraphs were adopted as drafted.

8.9.4. Lagoons (*slurry ponds*)

297. The subsection was deleted following the decision on changing the title of the section.

8.10. Tip failure

298. The Government Vice-Chairperson proposed to delete the word “failure” from the title of the section. The Employer Vice-Chairperson suggested to reword the title as “Tips and spoil dumps” as some places used the latter term. The latter proposal was adopted.

8.10.1. Hazard description

8.10.2. Assessment of risk

299. The subsections were adopted as drafted.

8.10.3. Control strategies

300. The Employer Vice-Chairperson proposed to replace “Competent specialist engineering expertise should be assigned to” by “A competent certified engineer(s) should”. This proposal was adopted.

301. The Employer Vice-Chairperson proposed to add two subparagraphs at the beginning of paragraph 3, as follows: “(a) need for compaction in design, construction and operations”; “(b) the need to avoid tipping into water”. These proposals were adopted.

302. The Worker Vice-Chairperson observed that statistics showed that most fatalities in opencast mining happened in low-hole dump systems. Safe dumping procedures were not included in the draft code. It was important to ensure that somebody guided the truck. In most big tips and dumps, dump operators would guide the trucks to a safe place so the materials could be offloaded properly. This was normally a bulldozer operator, who signalled the truck where to stop in order to offload; on other sites equipment signalled trucks to stop through camera detection. Some text on this was needed. The Employer Vice-Chairperson proposed to insert a new paragraph 4 that read: “The employer should develop, implement and maintain safe dumping procedures for tips or spoil dumps” based on the statement by the Worker Vice-Chairperson.

303. The Government and the Worker Vice-Chairpersons pointed out the importance of including some reference to the dangers faced by those working below tips or dumps. Workers had died when loads had been dumped on them. The Employer Vice-Chairperson accordingly proposed to subamend his previous amendment by adding at the end: “, including for work below tips or dumps”. The amendment was adopted as subamended.

304. The Employer Vice-Chairperson added that risks on slopes in opencast mines were also missing from the draft. Working below a small dump also incurred the separate risk of slope

failure. High walls were discussed later, but gravel forming a slope with loose falling material was not covered. The Worker Vice-Chairperson added that ramps under construction also posed a danger and had not been included. The Employer Vice-Chairperson accordingly proposed to add a new paragraph 5 to read: “There should be an inspection and monitoring programme in place for tips to continually verify the stability of the tip, the integrity of the berm, and the safety of dumping operations.” The Government Vice-Chairperson asked whether the new text referred to a dump berm, a berm to which trucks reversed, or a catch berm situated below the waste dump. The Employer Vice-Chairperson replied that it was the berm to which trucks reversed. The Worker Vice-Chairperson accordingly proposed to reword the amendment to read: “dump berm”. This proposal was adopted. The amendment was adopted as subamended.

305. In order to establish a standard risk-control process, the Employer Vice-Chairperson also proposed to add the same two paragraphs that he had added to 8.9.3.3, adapting the wording. A new paragraph 6 would read: “Workers and other persons who work on tips should be trained in the hazards and how to identify and report signs of failure or changing conditions that could present a risk”; a new paragraph 7 would read: “There should be action plans in place that are activated and implemented where there are signs of failure or changing conditions identified through monitoring or reporting by workers”. These proposals were adopted.

8.11. High wall failure

306. The Government Vice-Chairperson proposed that for consistency the title be changed from “High wall failure” to “High walls”. The title was adopted as amended.

8.11.1. Hazard description

307. The Employer Vice-Chairperson proposed adding a new subparagraph (c) at the very end of paragraph 1: “slumping or sloughing of gravel, sand or other loose materials in mines, including dry slumping or wet slumping (liquefaction).” The subsection was adopted as so amended.

8.11.2. Assessment of risk

308. The Government Vice-Chairperson proposed to add “rock structure and” after “Knowledge of the properties of” in the first sentence of paragraph 1. The amendment was adopted, and the subsection adopted as amended.

8.11.3. Control strategies

309. The Employer Vice-Chairperson proposed to replace “Competent specialist engineering expertise” by “A competent and certified engineer(s)” to ensure consistency with the amendment in the previous section. The proposal was adopted.
310. The Employer Vice-Chairperson proposed to reword paragraph 12 by inserting “or otherwise designated” before “and enforced:” and adding a new second subparagraph to read: “(b) at the base of high walls;”. This proposal was adopted.
311. The Government Vice-Chairperson proposed to replace the word “problem” with “high-risk” in subparagraph 12(a). The proposal was adopted.

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- 312.** The Worker Vice-Chairperson proposed, for the sake of consistency, inserting the two new paragraphs 6 and 7 that had been added in the section on dams, as follows:

“Workers and other persons who work near high walls should be trained in the hazards and how to identify and report signs of failure or changing conditions that could present a risk.”

“There should be action plans in place that are activated and implemented where there are signs of failure or changing conditions identified through monitoring or reporting by workers.”

- 313.** The Employer Vice-Chairperson proposed that the new paragraphs should follow paragraph 6. It was so decided, and the amendment was adopted. The subsection was adopted as amended.

8.12. Inundation or flooding of workings

8.12.1. Hazard description

- 314.** The subsection was adopted as drafted.

8.12.2. Assessment of risk

- 315.** The Employer Vice-Chairperson proposed to insert “dams,” between “strata,” and “rivers,” in the first line of paragraph 1. This proposal was adopted. The subsection was adopted as so amended.

8.12.3. Control strategies

- 316.** The Employer Vice-Chairperson proposed to insert “dams” after “rivers” in paragraph 2 for consistency. The proposal was adopted.

- 317.** The Government Vice-Chairperson proposed to insert “or a dam to be erected” after “breakthrough” in the third line: the Government expert from India had pointed out that a number of rivers were close to opencast operations, and that in one case a dam had had to be built at the crest of a river to ensure that it did not flood the open pit. The Employer Vice-Chairperson proposed to move “or a dam to be erected” to come after “to be left” in the third line. The amendment was adopted as so subamended.

- 318.** The Government Vice-Chairperson proposed to replace “considered” with “evaluated” in paragraph 3. The proposal was adopted. The subsection was adopted as amended.

8.13. Dredges and other floating installations

8.13.1. Hazard description

8.13.2. Assessment of risk

8.13.3. Control strategies

8.13.3.1. Acceptance by competent authority

8.13.3.2. Personnel

319. These subsections were adopted as drafted.

8.13.3.3. Safety precautions on board dredges

320. The Employer Vice-Chairperson proposed that in subparagraph 2(a), the word “four” be replaced by “sufficient”. The Worker Vice-Chairperson proposed that it read: “a sufficient number of properly fitted life vests or other personal flotation devices (PFDs)”. The Government Vice-Chairperson proposed to reword it to read: “a sufficient number of lifebuoys, strategically positioned on the dredge.” The Employer Vice-Chairperson disagreed with the use of “strategically” as it was subjective, and proposed to replace it by “properly”. This subamendment was adopted.

321. The Government Vice-Chairperson also proposed that, in subparagraph 2(d), the opening words should read: “a sufficient number of properly fitted [life vests ...]”. The proposal was adopted.

8.13.4. *Miscellaneous protective precautions*

322. The Employer Vice-Chairperson pointed out that the section should be renumbered as 8.13.3.4. He proposed to add after “... less than 400 mm in height” in paragraph 1, the following: “to prevent water ingress. All openings a person could fall into should be closed or guarded.” The Government Vice-Chairperson proposed to add: “Hull compartments should be treated as confined spaces, if applicable” at the end in view of the high number of fatalities in such situations. These proposals were adopted.

323. The Government Vice-Chairperson also proposed to add: “, and be trained in water survival” at the end of subparagraph 5(a). The Employer Vice-Chairperson preferred terminology in line with standard industry language. “The use of life jackets or personal flotation devices” was more appropriate in the given context. The Government Vice-Chairperson explained that the proposal concerned hypothermia prevention and accordingly reworded the proposal to read: “... belts or life jackets, and receive hypothermia survival training”. The Employer Vice-Chairperson stated that hypothermia training was impractical and amended the proposal to: “... use of safety belts, life jackets or personal flotation devices and what to do in the event of falling into the water.” This latter proposal was adopted. The subsection was adopted as so amended.

8.13.5. *Emergency provisions*

324. The Employer Vice-Chairperson proposed to add “or dredging” after “cease digging” in subparagraph 1(a). The amendment was adopted, and the subsection was adopted as amended.

8.13.6. *Other matters*

325. The Employer Vice-Chairperson proposed that paragraph 3 should read: “Every dredge should be provided with suitable toilets or latrines.” The proposal was adopted. The subsection was adopted as amended.

8.14. Surface buildings and structures

326. The Employer Vice-Chairperson observed that the draft lacked a section on work at height as such. A high incidence of fatalities occurred when working at height: it was the third leading cause of death in the mining industry. It was agreed to add a new section on working at height.
327. The Employer Vice-Chairperson noted that the section concerned working at height, yet the draft referred to buildings and seemed to be derived from guidelines for office buildings. The agreed new section on working at height would address the missing issues. With these reservations, he agreed to the proposed amendments. The subsection was adopted as amended.

8.14.1. Safety of buildings

328. The Employer Vice-Chairperson proposed to add after "... regulations and accepted standards" at the end of the first sentence of paragraph 1: ", including all standards for access ways, platforms and electrical wiring. They should be maintained in a safe condition and, wherever possible, be constructed of fire-resistant material." The remainder of the paragraph should be deleted. The proposal was adopted.

8.14.2. Safe means of access

329. The subsection was adopted as amended.

8.14.3. Management of falling hazards

330. The Government Vice-Chairperson proposed that paragraph 1 should read: "Hazards associated with a fall by a person from one level to another that is reasonably likely to cause injury to the person concerned or to any other person should be marked with appropriate signs and controlled"; to replace "fall-arrest" with "fall-prevention and fall-arrest" in paragraph 3; and to add a new paragraph 4 to read: "Where there is a risk of falling objects striking a worker, suitable control measures should be implemented." The proposals were adopted.

8.14.4. Provision of emergency lighting

331. The Government Vice-Chairperson proposed to add "stairways and" before "emergency escape ways" in subparagraph 1(d). The proposal was adopted and the subsection adopted as amended.

8.15. Machinery and plant

332. The Employer Vice-Chairperson observed that the word "plant" did not have an agreed meaning internationally, and proposed that it be deleted. The Government Vice-Chairperson supported this view. The change in title was adopted.

8.15.1. General provisions

333. This subsection was adopted as drafted.

8.15.2. Assessment of risk

334. The Employer Vice-Chairperson proposed to add after “information” in subparagraph 2(a), the phrase “, including manufacturers’ information,”; in subparagraph 2(b), to replace the opening words “identifying and documenting” by “perform a risk assessment to identify and document”; to replace subparagraph 2(c) by “developing and implementing procedures specifying controls for the operation and maintenance of the machine”; and to delete subparagraphs 2(d) and 2(e). These amendments were adopted.
335. The Government Vice-Chairperson proposed that the beginning of paragraph 4 should read: “Employers should consider the workers”. The Worker Vice-Chairperson regretted that this would remove the gender angle of the wording, but did not object. The amendment was not adopted. The rest of 8.15.2 was adopted as drafted.

8.15.3. Control strategies

336. This paragraph was adopted as drafted.

8.16. Automated machinery

337. The Employer Vice-Chairperson observed that automated machinery was only likely to be used by larger enterprises that had the capacity to manage large-scale engineering technology and systems. In this respect the text of this section seemed somewhat simplistic. It should therefore concentrate on process and functional safety, integrity levels, design, review and testing. This view was supported by the Worker Vice-Chairperson.

8.16.1. Hazard description

338. The Government Vice-Chairperson proposed that subparagraph 2(a) should read: “load and unload trains”. This amendment was adopted, and the rest of the subsection was adopted as drafted.

8.16.2. Assessment of risk

339. This subsection was adopted as drafted.

8.16.3. Control strategies

340. The Government Vice-Chairperson proposed that paragraph 2 should begin: “Competent persons with the required technical skills ...”. The amendment was adopted.
341. The Employer Vice-Chairperson proposed an improvement to subparagraph 3(f), to read simply “licenced (for example, for communications networks);”. This amendment was adopted.
342. The Employer Vice-Chairperson proposed to add a new subparagraph 3(g) to read: “provided with the technical information as to their design and use.” The amendment was adopted, and the subsection was otherwise adopted without change.

8.16.4. Tyre and rim safety

343. The Employer Vice-Chairperson observed that the numbering of the subsection suggested that tyre and rim safety issues were confined to the context of automated machinery. It should be renumbered as a new section. However, to avoid confusion, the Meeting should keep the current numbering throughout, and the change could wait until the published version. It was so decided.

8.16.4.1. Hazard description

344. The Employer Vice-Chairperson proposed to add a new sentence at the end of subparagraph 1(a) to read: “The greatest fatality risk potential is from tyres of greater than 24 inches or those with split rim assemblies”. This amendment was adopted.

345. The Government Vice-Chairperson proposed to replace “can have serious fatal consequences” at the end of paragraph 2 by the words: “can result in serious accidents, including fatalities”. The proposal was adopted.

346. The Worker Vice-Chairperson proposed to reword subparagraph 3(a) to read: “those related to inflating and deflating, handling and working with tyres, wheels and rims, including pneumatic tools”. The proposal was adopted. The rest of 8.16.4.1 was adopted as drafted.

8.16.4.2. Risk assessment

347. These paragraphs were adopted as drafted.

8.16.4.3. Control strategies

348. The Government Vice-Chairperson proposed to replace the word “systems” by “procedures” in subparagraph 1(b) and “Competent, specialist expertise” by “A competent person” in paragraph 2. The Worker Vice-Chairperson proposed to replace the word “competent” by “trained” in subparagraph 1(j). These proposals were adopted.

349. The Employer Vice-Chairperson proposed to add the word “rim” before “service” in subparagraph 1(e) and to add the word “procedures and” before “response” in subparagraph 1(i). These proposals were adopted.

350. The Employer Vice-Chairperson considered that some core and widely accepted controls were missing, and proposed to add the following new clauses under subparagraph (g):

- “(i) remote deflation and inflation of tyres during maintenance from a protected or guarded position;
- (ii) tyres on split rims or those with tubes fitted should be deflated to zero pounds per square inch (PSI), and other tyres to a maximum nominal pressure of 5 PSI, prior to removal of any retaining devices;
- (iii) all lock rings should be identifiable to ensure compatibility with rims and be inspected prior to fitment to ensure they are fit for purpose and checked for correct seating prior to inflation;”.

351. These amendments were adopted, and the paragraphs were adopted as amended.

8.16.5. Fires on large machinery

8.16.5.1. Hazard description

8.16.5.2. Assessment of risk

352. These paragraphs were adopted.

8.16.5.3. Control strategies

353. The Worker Vice-Chairperson proposed to replace “might be considered” by “should be considered” and add “to” before “include” in the first line of paragraph 1; to add a new subparagraph 1(a) to read: “training of workers in the use of fire extinguishers and fire suppression systems”; and to add a new subparagraph (c) to read: “fire detection and suppression systems as well as fire extinguishers should be maintained on a scheduled basis”. These proposals were adopted.

354. The Employer Vice-Chairperson proposed to add “for example rubber hoses” at the end of subparagraph (j) and to insert “inspection and” after “machine” in subparagraph (q). These proposals were adopted.

355. The Government Vice-Chairperson proposed to insert a new subparagraph before (m), to read: “washing of vehicles at appropriate intervals”. The proposal was adopted.

356. The paragraph was adopted as amended.

8.17. Electrical equipment

8.17.1. General provisions

357. The Worker Vice-Chairperson proposed to add “such as securing that accumulation of dust is not permitted” at the end of the second sentence of paragraph 1. The Employer Vice-Chairperson considered that subparagraph 3(b) would be a better place to insert the text. This latter proposal was adopted.

358. The Employer Vice-Chairperson proposed to replace “competent” with “suitably qualified and competent” in paragraph 1. The proposal was adopted. The Government Vice-Chairperson stated that the term “competent” was not defined and asked for clarity. The Worker Vice-Chairperson responded that all electrical workers had a “recognized competency” which included the certification that the trade required. He proposed to replace “qualified” by “certified”. This proposal was adopted, and the amendment was adopted as subamended.

359. The Employer Vice-Chairperson observed that the use of the words “under-resourced” in paragraph 2 could be misconstrued, and proposed to delete the words. The proposal was adopted.

360. The Government Vice-Chairperson proposed to replace “acting” by “working directly” in paragraph 4; and to add a new paragraph 6 that read: “Electrical installations should be protected from inadvertent access by fencing or locked installations and appropriate warning signs posted”. These proposals were adopted.

361. The Employer Vice-Chairperson recalled the agreement to monitor for areas where dust explosions might occur. This was one: he proposed to add at the end of subparagraph 3(b)

the words “, including ensuring that accumulation of dust is not permitted”. The proposal was adopted.

362. The subsection was adopted as amended.

8.17.2. Insulation

363. The Government Vice-Chairperson considered that the list offered in the subsection might not be exhaustive and could suffer from some major exclusions. He proposed to delete it. The Worker Vice-Chairperson expressed concern that some countries may not have any standards on the topic, and the text drafted was better than nothing, even if not exhaustive. The amendment was withdrawn. The subsection was adopted as drafted.

8.17.3. Control devices

364. The Government Vice-Chairperson proposed to add “or lock-out” after “isolation” in paragraph 1 due to differences in the words used in each country; to add “appropriately” before “labelled”; and to insert a new paragraph 2 that read: “Control devices need to be maintained and inspected at regular intervals”. The subsection was adopted as so amended.

8.17.4. Distribution boxes

365. The Government Vice-Chairperson proposed to add: “display wiring diagrams and” after “Distribution boxes should” in the last sentence of paragraph 1. The Employer Vice-Chairperson subamended the proposal to read: “Distribution boxes should display single-line wiring diagrams [and be labelled ...]. The subamendment was adopted, and the subsection was adopted as so amended.

8.17.5. Earthing systems

366. The subsection was adopted as amended.

8.17.6. Overload and earth leakage protection

367. The Employer Vice-Chairperson proposed to add: “or defeating fuses or bridges” after “uncalibrated fuses” in paragraph 2; and to add “at 30 milliseconds” after “30mA”. The proposal was adopted. The subsection was adopted as amended.

8.17.7. Transformers

368. The Worker Vice-Chairperson proposed to add: “and marked as PCBs” after “removed from service” in paragraph 2. The proposal was adopted. The subsection was adopted as amended.

8.17.8. Conductors

369. The Employer Vice-Chairperson proposed to reword paragraph 1 to read: “Conductors or wiring, and the conditions under which they are installed and used, [...]”. The proposal was adopted.

370. The expert from the Government of Zambia proposed to delete paragraph 8 as it seemed out of context. The Employer Vice-Chairperson explained that electric power lines were

conductors and could attract lightning. The expert from the Government of Zambia withdrew his amendment.

371. The subsection was adopted as amended.

8.17.9. Switchboards and switchgear

372. The Employer Vice-Chairperson proposed to add: “prevented or” before “prohibited” in subparagraph (f). The proposal was adopted. The subsection was adopted as amended.

8.17.10. Protection of portable, transportable and mobile machines

373. The Employer Vice-Chairperson proposed to insert a new paragraph 5 that read: “The inspection and testing intervals of equipment should be based on its use”, as the section was about how the equipment was being used and moved. The proposal was adopted.

374. The Government Vice-Chairperson noted that different countries had different requirements and proposed to reword paragraph 2 to read: “In the case of earth leakage devices and related equipment, national laws, regulations or accepted standards should specify:”. The proposal was adopted.

375. The Employers’ adviser from Switzerland explained that it took a specific amount of time for safety devices to trip a circuit, and stronger currents took more time. He proposed to reword subparagraph 2(b) to read: “the time to trip the circuit supplying the equipment; and”. The proposal was adopted.

376. The subsection was adopted as amended.

8.17.11. Miscellaneous safety procedures

377. The Employer Vice-Chairperson proposed to replace “mobile equipment should not run” by “Controls should be in place to prevent mobile equipment running” in paragraph 1. The proposal was adopted.

378. The Government Vice-Chairperson proposed to replace the word “suitable” by “appropriate” in paragraph 6. The proposal was adopted.

379. The subsection was adopted as amended.

8.18. Transport and material handling

8.18.1. Mobile equipment

380. The Worker Vice-Chairperson proposed to add “seatbelts and” after “equipped with” in paragraph 2.

381. The Employer Vice-Chairperson proposed in paragraph 1 to replace “1,000 kg” with “4,500 kg”: 1,000 kg was not an adequate amount when discussing heavy vehicles in opencast mines. A 1,000 kg vehicle was about the size of a modern family car. The proposal was adopted.

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- 382.** The Employer Vice-Chairperson proposed to add: “Based on a risk assessment of the mobile equipment’s characteristics and intended use, it should be equipped with appropriate and falling object protective ...” at the beginning of paragraph 2.
- 383.** The Government Vice-Chairperson questioned this proposal in view of regulatory requirements in different countries, and proposed to reword it as: “Based on a risk assessment of the mobile equipment’s characteristics and intended use, and in accordance with national laws, regulations and applicable standards, be equipped ...”. This subamendment was adopted, and the proposal was adopted as so amended.
- 384.** The Employer Vice-Chairperson proposed to add a new paragraph after paragraph 2 to read: “All mobile equipment that transports people should be fitted with seatbelts for all occupants, and these should be worn by all occupants when the vehicle is in transit.” The proposal by the Workers’ group could hence be withdrawn, as the new proposal provided more clarity. The proposal was adopted.
- 385.** The Employer Vice-Chairperson proposed to add a new paragraph 10 at the end of the subsection that read: “All operators or drivers of mobile equipment should be trained, competent and authorized for the equipment they operate and the areas they operate it in.” He gave the example of a driver having a pit licence in an opencast mine. Being an authorized driver was also necessary. The proposal was adopted.
- 386.** The subsection was adopted as amended.

8.18.2. Ergonomics

- 387.** The Worker Vice-Chairperson proposed to add: “... and reverse detection systems;” after “proximity detection system” in subparagraph 2(d). The Employer Vice-Chairperson expressed reservations about whether this was the best place for the addition, but accepted the proposal. The proposal was adopted. The subsection was adopted as amended.

8.18.3. Construction and safety

- 388.** The Government Vice-Chairperson observed that the title of the subsection was unclear, as the word “construction” had different meanings in different jurisdictions. He proposed to replace it by “Operational safety”.
- 389.** The Employer Vice-Chairperson stated that the section applied to equipment being used, and that this was not clear from the proposed new text. He suggested “Mobile equipment construction and use”, as “operational” had a different meaning from what was discussed in the subsection.
- 390.** The Worker Vice-Chairperson proposed to delete all text after “loaded or unloaded” in subparagraph 10(a) as the draft language did not convey safe practice; and to delete subparagraph 10(c) due to the safety risk the language could generate.
- 391.** The Employer Vice-Chairperson considered that this amendment seemed to prohibit transport of persons in mobile equipment. This was illogical, since the section was about mobile equipment and the transport of persons.
- 392.** The Worker Vice-Chairperson explained that the intention was to prevent inappropriate use of equipment for transporting persons, and gave the example of a person riding a forklift.

393. The Employer Vice-Chairperson accordingly proposed the following text for subparagraph 10(a): “in or on mobile equipment or parts of mobile equipment, unless the equipment is properly designed for that purpose and is fitted with appropriate safety devices, such as seatbelts, for that purpose;”. Subparagraphs (b) and (c) would then be unnecessary and could be deleted. This subamendment was adopted.

394. The Employer Vice-Chairperson observed that the mention of licensing in subparagraph 5(a) seemed redundant, as it had already been covered elsewhere. He proposed to add: “follows approved procedures” after “hazards involved” in paragraph 13. The proposal was adopted.

395. The subsection was adopted as amended.

8.18.4. Rail transport hazards

396. The Worker Vice-Chairperson proposed to replace “they should satisfy the employer that they are” by “they should be trained so that they are” in paragraph 3. The proposal was adopted.

397. The Employer Vice-Chairperson proposed to subamend the amendment to read: “... they should be trained so that they are fully conversant with the relevant operating rules, signals and signal codes and are competent to discharge their duties and are authorized to work on the mine by the employer.” Employers needed to have control of training and authorization due to the possible presence of third-party workers. The subamendment was adopted.

398. This subsection was adopted as amended.

8.18.5. Aerial ropeways

399. The subsection was adopted as drafted.

8.18.6. Conveyors

400. The Government Vice-Chairperson proposed to add after “pulleys” in paragraph 6, “and sprockets”. The proposal was adopted.

401. The Government Vice-Chairperson proposed to amend the first sentence of paragraph 5 to read: “No person should ride on a conveyor belt unless it is designed and equipped for man-riding.”

402. The Worker Vice-Chairperson stated that no one should ride on conveyors, and that the code of practice needed to raise the bar for all jurisdictions.

403. The Employer Vice-Chairperson agreed with the Worker Vice-Chairperson and proposed to reword the first sentence of paragraph 5 to read: “No person should ride on a conveyor belt unless it is designed, equipped and operated safely for man-riding.” Conveyors were often operated very slowly when moving persons, and it was better to put them in vehicles.

404. The Government expert from the Russian Federation observed there was special legislation in the Russian Federation regarding conveyor belts and man-riding. This covered the movement of conveyors and permitted persons sitting on conveyors. This applied to both opencast and underground mines.

405. The Worker Vice-Chairperson stated that allowing people to ride conveyors promoted bad practice.

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406. The Employer Vice-Chairperson requested clarification regarding Russian legislation on this practice in opencast and underground mines.
407. The Government expert from the Russian Federation explained that the legislation encompassed how people should get on the conveyer, how the conveyor belt moved, and the placement of the conveyor belt in both opencast and underground mines. The conveyers were certified by the competent authority.
408. The Employer Vice-Chairperson recommended certification regarding design and installation in addition to current legislation. The Executive Secretary suggested that the text could read: "... designed, equipped and operated for man-riding in accordance with national laws and regulations".
409. The Worker Vice-Chairperson noted that permitting people to ride conveyors was a practice that was not in line with the principles contained in and the level of protection afforded by Convention No. 176.
410. The Government Vice-Chairperson proposed to add "and certification" after "regulations" in the text under discussion. Many of these considerations had been covered by the ILO code of practice *Safety and health in the use of machinery* (Geneva, 2013).
411. At its final sitting the Meeting had before it two alternative texts to replace paragraph 5. The Meeting adopted the "new alternative text", which replaced the first sentence by "Conveyors should not be used for the conveyance of people unless the design of the conveyor is certified by the competent authority and national laws permit and regulate the operation, inspection, maintenance and use of the conveyor for this purpose."
412. The subsection was adopted as amended.

8.18.7. Conveyor bridges and overburden spreaders

413. The Government Vice-Chairperson asked whether paragraph 1 included stacking conveyors. The Executive Secretary answered that stacking conveyors were included. The Government Vice-Chairperson accordingly proposed to amend the title to read: "Conveyor bridges, stacking conveyors and overburden spreaders". The proposal was adopted.
414. The Employer Vice-Chairperson proposed to delete the words "located close to a road or travelling way" after the word "counterweight" in the first sentence of paragraph 5; and to add a new paragraph between paragraphs 7 and 8 that read: "Where persons walk or work under an elevated conveyor they should be guarded from falling objects". These proposals were adopted.
415. The subsection was adopted as amended.

8.18.8. Stockpiles, bins and storage silos

416. The Government Vice-Chairperson proposed to replace the word "belts" with "lanyards and a fall-arrest device" in subparagraph 1(e). The proposal was adopted.
417. The Worker Vice-Chairperson proposed to add the words "and proper PPE should be issued and worn" at the end of paragraph 2; and also in paragraph 2 to delete the words "coal or other" before the word "material". These proposals were adopted.

418. The Government Vice-Chairperson proposed to add the words “or flammable” after the word “gases” in paragraph 2. The proposal was adopted.

419. The Worker Vice-Chairperson proposed to add “or methane” after the word “firedamp” in paragraph 3, as the word was not commonly used. The proposal was adopted.

420. The subsection was adopted as amended.

8.18.9. Mobile and travelling cranes

8.18.9.1. General requirements

421. The Worker Vice-Chairperson proposed to replace the word “instructions” with “specifications” at the end of paragraph 1; and to add “and the crane meets national standards and the manufacture’s specifications” at the end of paragraph 2. These proposals were adopted. The paragraphs were adopted as amended.

8.18.9.2. Safety precautions

422. The Employer Vice-Chairperson proposed to add “, should never be under a suspended load and loads should not be lifted over people. Exclusion zones should be established around lifting operations” after the word “loads” in subparagraph 1(c). The proposal was adopted.

423. The Worker Vice-Chairperson proposed to add “operate the crane and” after “authorized to” in subparagraph 1(e). The proposal was adopted. The Employer Vice-Chairperson in response proposed to add a new subparagraph 1(f) that read: “all cranes, lifting apparatus and rigging should be inspected, maintained and tested by competent persons in accordance with national laws and approved standards”. The proposal was adopted.

424. The paragraphs were adopted as amended.

8.19. Transportation of hazardous goods to and from the site

425. The Government Vice-Chairperson proposed that the end of paragraph 1 should read “... and licensed, competent operators”. The proposal was adopted. The section was adopted as amended.

8.20. Traffic

8.20.1. Hazard description

426. The subsection was adopted as drafted.

8.20.2. Risk management

427. The Worker Vice-Chairperson proposed to add the words “and pedestrian traffic” at the end of subparagraph 1(c). The proposal was adopted. The subsection was adopted as amended.

8.20.3. Control strategies

8.20.3.1. Roads

428. The Employer Vice-Chairperson proposed that the words in brackets in paragraph 1 should read: “(for example, at least half the height of the largest wheel)”; and to add at the end of paragraph 3: “If the above control measures cannot be fully implemented, alternate risk reduction measures such as traffic controls should be applied”. These proposals were adopted.
429. The Worker Vice-Chairperson suggested to add “or run-away” after “escape” in the introductory part of paragraph 7. The proposal was adopted.
430. He further proposed to add a new subparagraph (c) that read: “vehicles should not exceed the gradient specified by the manufacturer”. The Employer Vice-Chairperson suggested to replace the words in brackets in paragraph 7 by “as determined by a risk assessment”. These proposals were adopted.
431. The Government Vice-Chairperson proposed to add a new paragraph 9 that read: “Sharp bends should be fitted with mirrors, so operators can see oncoming vehicles”. The Employer Vice-Chairperson subamended the proposal to read: “The design of roads should avoid sharp bends. Should sharp bends exist, appropriate control measures should be considered”. The subamendment was adopted, and the paragraph was adopted as so amended.
432. The rest of the section was adopted as drafted.

8.20.3.2. Traffic rules

433. The Government Vice-Chairperson proposed to add a sentence at the end of paragraph 1 to read: “Maximum permissible vehicle speeds should be posted”. The proposal was adopted.
434. The Worker Vice-Chairperson suggested to add a new paragraph 7 to read: “When haul roads are discontinued the traffic plans should be altered and shared with the workers”; and to delete the words “As far as practicable,” in paragraph 5 and add the words “three-point” after the words “fitted with”, as most seatbelts were made in that way. These proposals were adopted.
435. The paragraphs were adopted as amended.

8.20.3.3. Traffic signs

8.20.3.4. Parking areas

8.20.3.5. Clearance distances

436. These paragraphs were adopted as drafted.

8.21. Multiple people carriers

8.21.1. Hazard description

8.21.2. Assessment of risk

437. These sections were adopted as drafted.

8.21.3. Control strategies

438. The Employer Vice-Chairperson proposed to add a further subparagraph (i) to read: “regular inspection and maintenance of critical controls, for example breaking and steering systems;”. The proposal was adopted.
439. The Worker Vice-Chairperson proposed to an additional subparagraph after it, to read: “consider suspending production and/or traffic when there could be contact with multiple people carriers”. The proposal was adopted. The subsection was adopted as amended.

8.22. Explosives

8.22.1. General provisions

440. The Employer Vice-Chairperson proposed to add after “handle” in paragraph 1, the words: “or have access to”. The proposal was adopted. The rest of the subsection was adopted as drafted.

8.22.2. Storage of explosives

441. This section was adopted as drafted.

8.22.3. Transport of explosives

442. The Employer Vice-Chairperson proposed to add after “properly constructed” in paragraph 2, the words “and locked”. The proposal was adopted. The rest of the subsection was adopted as drafted.

8.23. Shotfiring

8.23.1. General provisions

443. The Employer Vice-Chairperson proposed to add after “National laws”, the words “and site procedures” in paragraph 1. The proposal was adopted.
444. The Worker Vice-Chairperson considered that a reference to an exclusion zone around the proposed blast would be valuable. He accordingly proposed to add, at the end of subparagraph 4(a), the text: “(for example, an exclusion zone of 500 metres may be established)”. The Employer Vice-Chairperson considered that the distance could vary depending on the site, and proposed to add: “and depending upon the circumstances,” after “for example”. The proposal was adopted as so subamended.
445. The Worker Vice-Chairperson proposed to add, after “zone” in subparagraph 4(b), the words: “and over all radio channels, and once a warning is given radio silence should be imposed”. The proposal was adopted.
446. The rest of the subsection was adopted as drafted.

8.23.2. Misfires

447. The Employer Vice-Chairperson observed that blast procedures involved specific competency, and were the activity most likely to be subject to existing rules and regulations. The draft had hence rightly been limited to the essentials.
448. The Worker Vice-Chairperson proposed to add at the end of paragraph 2: “(for example, misshole refiring or washing the misshole out)”. The proposal was adopted. The rest of the subsection was adopted as drafted.

8.23.3. Electrical firing

449. The subsection was adopted as drafted.

8.24. Drilling

8.24.1. General safety precautions

450. The subsection was adopted as drafted.

8.24.2. Drilling rigs

451. The Employer Vice-Chairperson proposed to shorten the first sentence of paragraph 3 to be more categorical. It should simply read: “No person should be on a rig mast while the drill-bit is operating.” The proposal was adopted.
452. The Government Vice-Chairperson proposed to add a new paragraph at the end of the subsection to read: “6. All drill rigs should be equipped with a properly designed and maintained dust suppression and collection system.” The Employer Vice-Chairperson observed that dust was not an issue at all drill rigs, and accordingly proposed to define the context clearly. The new paragraph should hence read: “Where there is an identifiable risk of inhalable or respirable dust, drill rigs with a properly designed and maintained dust suppression and collection systems should be used.” The Worker Vice-Chairperson proposed that a reference to the need for a prior risk assessment be added. The Employer Vice-Chairperson proposed instead to change “identifiable” to “identified”, since it was then clear that such an assessment had been carried out. The proposal was adopted, and the paragraph was adopted as so subamended.

8.25. Excavation and loading

8.25.1. Excavation

453. The Government Vice-Chairperson proposed, in paragraph 5, to clarify in the first sentence that the face in question was the “working face”. The proposal was adopted. He further proposed to add a new sentence at the end of that paragraph to read: “Cabins should be positively ventilated, and air-conditioned.” The Employer Vice-Chairperson subamended the proposal by adding at the end: “in significantly hot or cold areas”. The subamendment was adopted, and the amendment was adopted as subamended. The rest of the subsection was adopted as drafted.

8.25.2. Single-bucket excavators

454. The Employer Vice-Chairperson proposed to reduce paragraph 3 to its first two sentences, combining and rewording them to read: “Where it is necessary to move an excavator using the aid of an assistant, the assistant should use approved signals and should be within sight of the operator at all times.” Such assistants were sometimes termed “spotters”. The proposal was adopted. The rest of the subsection was adopted as drafted.

455. The Government Vice-Chairperson questioned the use of the term “jib” in paragraphs 1 and 2. The reference was clearly to the “boom”, and should be changed. The proposal was adopted. The rest of the subsection was adopted as drafted.

8.25.3. Multi-bucket and rotary excavating machines

456. The subsection was adopted as drafted.

8.25.4. Scrapers and bulldozers

457. The Worker Vice-Chairperson proposed that the references to “blade” in paragraphs 5 and 6 should all refer instead to “blade or ripper”. The proposal was adopted. The rest of the subsection was adopted as drafted.

8.25.5. Loading

458. The Employer Vice-Chairperson proposed to change the title of the subsection to “Loading and dumping”. The proposal was adopted.

459. The Worker Vice-Chairperson proposed to add, at the beginning of subparagraph 2(c), a new sentence to read: “any equipment or person entering the loading area, such as bulldozers and dump trucks, must first have positive two-way communication with the loading machine operator.” The proposal was adopted.

460. The Employer Vice-Chairperson proposed to end subparagraph 3(b) at the word “provided” and delete the rest. The proposal was adopted.

461. The rest of the subsection was adopted as drafted.

9. General controls

462. The introductory paragraphs were adopted without change.

9.1. Surveyors and plans

9.1.1. Competent surveyor

463. The Government Vice-Chairperson proposed to delete “person to act as the” in the first sentence, since it was misleading. The proposal was adopted.

9.1.2. Responsibilities of the mine surveyor

9.1.3. Plans: General

464. These subsections were adopted without change.

9.1.4. Plans: Requirements

465. The Government Vice-Chairperson proposed to add, at the end of subparagraph 1(b), the words “and to external emergency services”. The proposal was adopted.

9.1.5. Faulty plans

9.1.6. Abandonment plans

466. These sections were adopted without change.

9.2. Mine registration and record-keeping

9.2.1. Commencement and cessation of mining operations

9.3. Records and returns

467. These sections were adopted without change.

9.4. Mine design and methods

9.4.1. Design requirements

468. The Government Vice-Chairperson proposed, in clause 4(d)(ii), to replace “security of the walls” by “safety and ground stability of the walls”. The proposal was adopted.

9.4.2. Stripping of overburden

469. The Government Vice-Chairperson proposed to add a new sentence at the end of paragraph 4 to read: “These protective procedures should be in accordance with the mine emergency plan.” The proposal was adopted. The subsection was otherwise adopted as drafted.

9.4.3. Mining methods

470. The Employer Vice-Chairperson observed that various methods were used worldwide, yet nowhere in the draft were they described in their diversity. He proposed to add a new paragraph at the beginning to read: “Mining methods include but are not limited to: truck and shovel, strip, quarrying, and rock sawing, among others. A risk assessment should be performed to determine the specific control measures required to manage the people, equipment and work environments that are involved.” The proposal was adopted.

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471. The Government Vice-Chairperson found the term “taken down” in paragraph 2 incomprehensible. He proposed to replace it by “mitigated”. The proposal was adopted.
472. The Employer Vice-Chairperson proposed to replace the term “safety belt” in subparagraph 10(a) by “safety harness”, to which the Worker Vice-Chairperson added “and lanyard”. The proposals were adopted.
473. The subsection was otherwise adopted as drafted.

9.5. Competence, education and training

9.5.1. General provisions

474. The Government Vice-Chairperson proposed to add a new first paragraph to read as follows: “Prior to the commencement of mine operations, job tasks and job descriptions should be determined and a training needs assessment should be performed to determine training and competency needs.” The Employer Vice-Chairperson suggested this be placed after the current first paragraph. This subamendment was adopted and the proposal was adopted as subamended.
475. The Employer Vice-Chairperson proposed to reword subparagraph 2(a) to read: “the induction and refresher training for workers in the industry”; in subparagraph 2(b) to replace “period and type of training” by “competency”; in subparagraph 2(c) to delete “the period of attendance by persons at”; and in subparagraph 2(d) to replace “the period of training in each operation, including training” by “training and refresher training”; and in subparagraph 4(i) to add “mine rescue,” after “emergency measures”. These proposals were adopted.
476. The Worker Vice-Chairperson proposed, in subparagraph 4(h), to add a reference to “hazardous and toxic substances”. The Employer Vice-Chairperson supported this, and proposed other additions so that the subparagraph should read: “the health risks of inhalable and respirable dusts and hazardous and toxic substances and measures needed to prevent exposure and related diseases”. These proposals were adopted.
477. The Worker Vice-Chairperson proposed to replace “committees” in subparagraph 4(r) by “representatives”. The proposal was adopted.
478. The subsection was adopted without other changes.

9.5.2. Qualifications of managers and supervisory officials

479. The Employer Vice-Chairperson proposed to replace “employ” in paragraph 1 by “have sufficient [managers]”, since mines varied greatly in size. The proposal was adopted.
480. The Worker Vice-Chairperson proposed that in the first paragraph a reference to “industrial hygienists” should be added after “mining engineers”; and that in paragraph 2, after “mining laws”, the words “or national regulations related to mines” be added. These proposals were adopted.
481. The subsection was adopted without other changes.

9.5.3. Qualifications, training and skills testing of workers

9.5.4. Qualifications of contractors and others working at the mine

482. These subsections were adopted as drafted.

9.6. Personal protective equipment (PPE)

9.6.1. General

483. The Government Vice-Chairperson proposed to add a new paragraph at the beginning of the subsection to read: “There are basic minimum requirements for mandatory PPE for all persons. For example, this will include helmets, coveralls, safety glasses, safety boots and gloves”. The Employer Vice-Chairperson proposed to revise the text to read: “The minimum requirements for mandatory PPE on the mine should be established and communicated, for example helmets, coveralls, safety glasses, safety boots and gloves”, and proposed that it would be more logical to insert it after the first paragraph. This proposal was adopted, and the amendment was adopted as subamended.

484. The Government Vice-Chairperson proposed to add a further paragraph to follow the new paragraph 3 to read as follows: “PPE should be issued to an individual worker and not interchanged unless it has been maintained and properly sanitized.” The Employer Vice-Chairperson proposed to add “as new” after “issued”. The amendment was adopted as so subamended.

485. The Worker Vice-Chairperson proposed to replace what was now subparagraph 5(c) by: “in the nature of the hazards and the adverse health effects of exposure and how the equipment is intended to protect against these”. The proposal was adopted.

486. The Government Vice-Chairperson proposed that the section should cross-reference the chapter on specific hazards with regard to the suitability of PPE for the various hazards detailed there. He proposed a new paragraph to follow what was now paragraph 6 to read as follows: “PPE should meet the requirements of Chapter [x] with respect to each hazard identified at the facility, for example heat and cold stress, noise exposure, hazardous substances and vibration.” The proposal was adopted. The subsection was otherwise adopted as drafted.

9.6.2. Head protection

9.6.3. Face and eye protection

487. These subsections were adopted as drafted.

9.6.4. Upper and lower limb protection

488. The Employer Vice-Chairperson questioned the meaning of footwear “without tongues” in paragraph 3. He proposed it be reworded to state simply: “Trousers legs should be pulled over the top of the boot and not tucked inside”; in paragraph 4, the phrase “Slip-resistant properties” should be replaced by “Slip, impact and acid-resistant properties”. These proposals were adopted. The subsection was otherwise adopted as drafted.

9.6.5. Respirators

9.6.6. Hearing protection

9.6.7. Protection from falls

489. These subsections were adopted as drafted.

9.6.8. Work clothing

490. The Government Vice-Chairperson proposed to reword subparagraph 2(c) to read: “the requirements of workers to wear reflective clothing”. The proposal was adopted.

491. The Worker Vice-Chairperson proposed to add a sentence at the end of paragraph 3 to read: “The employer should ensure that there are facilities to store work and street clothing separately.” The Employer Vice-Chairperson observed that this issue was addressed later in the text in subsection 12.2 (“Personal hygiene”). The proposal was withdrawn.

9.7. Ergonomics

492. The Government Vice-Chairperson asked whether this section should be moved as a whole to the chapter on specific hazards. An Employer expert observed in reply that ergonomics was a matter of both organizational and individual concerns related to on-the-job experience. It was treated as such by the World Health Organization (WHO), for example, for whom it was a preventive health issue. Designing workplaces and equipment so as to avoid musculoskeletal injuries required anthropometric knowledge, and came before measures designed to address risks: it was a question of accommodating workplaces to human physiology. For this reason the issue should remain as a control measure in the code. The Worker Vice-Chairperson considered that ergonomics meant matching the workplace to human capacity, not the hazards involved. It was accordingly agreed to retain the section in the current chapter.

9.7.1. Musculoskeletal injuries

9.7.1.1. Hazard description

493. The Worker Vice-Chairperson proposed to add “jolts, jars and” before “overexertion” in paragraph 2. The proposal was adopted. The paragraphs were otherwise adopted without change.

9.7.1.2. Assessment of risk

494. The Government Vice-Chairperson proposed to add “risk” after “ergonomic” in paragraph 2. The proposal was adopted. The paragraphs were otherwise adopted without change.

9.7.1.3. Control strategies

495. The paragraphs were adopted as drafted.

9.7.2. Safety signs, alarms and communication

9.7.2.1. Visual and auditory alarms

496. These sections were adopted as drafted.

9.7.2.2. Communications protocols

497. The Government Vice-Chairperson proposed to change the heading to “Electronic communications protocols”. The amendment was adopted and the paragraphs were adopted as drafted.

9.7.2.3. Availability of information

498. The Government Vice-Chairperson proposed a new subparagraph (f) to read: “information with respect to controlled products in accordance with the Global Harmonized System (GHS).” The Worker and Employer Vice-Chairpersons corrected the proposal to read: “hazardous products” instead of “controlled products”, as in the GHS. The amendment was adopted as corrected, and the paragraphs were adopted as amended.

9.8. General precautions for frozen soil and permafrost

499. The section was adopted as drafted.

10. Work organization

10.1. Job safety analysis

500. The Government Vice-Chairperson proposed to amend the second sentence of paragraph 4 to read: “Workers should be trained and the SWPs should be reviewed with each worker ...”. The Employer Vice-Chairperson subamended the proposal to read: “Workers should be trained in the relevant SWPs and these should be reviewed with each such worker ...” as many SWPs did not apply to all workers. The subamendment was adopted and the section was adopted as so amended.

10.2. Work teams

501. The Government Vice-Chairperson proposed to amend the section to read: “The employer should ensure that work teams are resourced adequately to undertake the assigned tasks safely and without risks to their health.”

502. The Employer Vice-Chairperson stated that risks were often inherent to the work. He instead proposed: “The employer should ensure that work teams are resourced adequately to undertake the assigned tasks safely.” This proposal was adopted and the section was adopted as amended.

10.3. Persons working alone

- 503.** The Employer Vice-Chairperson proposed to amend the beginning of the paragraph to read: “Working alone should be avoided. If it is necessary, the employer should take appropriate measures ...”. The amendment was adopted.
- 504.** The Government Vice-Chairperson proposed to add: “such as regular checks by their supervisor during work shifts” after “measures”. The Worker Vice-Chairperson opposed the amendment. The amendment was withdrawn.
- 505.** The section was adopted as amended.

10.4. Confined spaces

- 506.** The Government Vice-Chairperson proposed that this section should be moved in the final text to the chapter on specific hazards. The proposal was adopted.

10.4.1. Hazard description

- 507.** The Worker Vice-Chairperson proposed to replace paragraph 1 by: “A confined space means a tank, process vessel, underground vault, tunnel or other enclosure not intended for human occupancy. A person would only enter if there was work to be done.”
- 508.** The Employer Vice-Chairperson subamended the text to read: “A confined space is an enclosed or partially enclosed space that is not designed or intended for continuous human occupancy and at any time during entry, occupancy or exit can have a hazardous atmosphere, risk of engulfment or entrapment, for example a tank, process vessel, underground vault or tunnel. A person would only enter if there was work to be done.” The subamendment was adopted and the subsection was adopted as amended.

10.4.2. Assessment of risk

- 509.** The Employer Vice-Chairperson proposed to add “and isolated” at the end of clause 1(d)(ii). The amendment was adopted and the subsection was adopted as amended.

10.4.3. Control strategies

- 510.** The Government Vice-Chairperson proposed to replace “sign off” with “authorization” in paragraph 4 to avoid misunderstanding. The amendment was adopted.
- 511.** The Worker Vice-Chairperson proposed to add “, and that person shall have no other assignments.” before “Additional emergency ...” in paragraph 7. The Employer Vice-Chairperson proposed to add “where a risk assessment identifies the need” at the end of paragraph 7 as it was not possible to have rescue harnesses in every situation. These amendments were adopted and the subsection was adopted as amended.

10.5. Admission of outside persons

- 512.** The Employer Vice-Chairperson proposed to insert “and competent” after “by a responsible” in paragraph 1. The amendment was adopted and the section was adopted as amended.

10.6. Small-scale artisanal mining activity

- 513.** The Worker Vice-Chairperson welcomed the Offices efforts to promote and consider small-scale mining.
- 514.** The Government Vice-Chairperson proposed to add “In accordance with national laws and regulations,” at the beginning of paragraph 3. The amendment was adopted and the section was adopted as amended.

11. Safety and health committees

- 515.** The Worker Vice-Chairperson proposed to move this chapter to come between Chapters 2 and 3 in the final text. The proposal was adopted.

11.1. Safety and health committees

- 516.** The Worker Vice-Chairperson proposed to add: “, and to educate workers (i) on their right to refuse unsafe work without fear of reprisals; (ii) their right to participate in all aspects of their safety and health; and (iii) their right to know how their work activities may affect their safety and health” at the end of paragraph 2. He also proposed to replace “labour inspectorate” with “competent authority” in subparagraph 3(b). These proposals were adopted.
- 517.** The Government Vice-Chairperson proposed to change subparagraph 3(a) to read: “as soon as practicable of any occupational accident, occupational disease or dangerous occurrences at the mine; and”. The amendment was adopted.
- 518.** The section was adopted as amended.

11.2. Industry tripartite committees

- 519.** The Government Vice-Chairperson proposed to add “In accordance with national laws and regulations,” at the beginning of paragraph 1. The section was adopted as so amended.

12. Special protection

12.1. General welfare

- 520.** The Employer Vice-Chairperson proposed to amend subparagraph 2(c) to read: “based on the nature of the mine and its operations, adequate ...”. The section was adopted as so amended.

12.2. Personal hygiene

- 521.** The section was adopted as drafted.

12.3. Alcohol and drug use

522. The Worker Vice-Chairperson proposed to add “or require” after “Workers who seek” in paragraph 4. The Employer Vice-Chairperson disagreed and stated that help could only be given to those who sought it.
523. The Worker Vice-Chairperson explained that alcohol and drug addiction was considered a disease under several legislations and should be treated as such. Paragraph 5 gave the employer the authority to discipline workers, but employers should not discipline someone for being ill. Paragraphs 4 and 5 should be read together. Paragraph 3 stated that the employers had the right to test. If they were to find a problem, the employers could require rehabilitation.
524. The Employer Vice-Chairperson stated that it might be the case that an employer would require a person to get help even though the person in question did not believe they had an alcohol or drug addiction. It would not be correct to force someone to get help. This was a matter of human rights. Requiring someone to get help might raise several legal questions. He requested the Office to provide information in this regard.
525. The Worker Vice-Chairperson withdrew his earlier amendment and proposed to replace “Workers who seek treatment and rehabilitation for alcohol and drug-related problems should not be disciplined or” with “Workers with drug-related problems should not be [discriminated against]” in paragraph 4. The Employer Vice-Chairperson considered that the new proposal tended to contradict other paragraphs. Job security, mentioned in paragraph 4, seemed a somewhat archaic concept.
526. Following further reflection, at the Meeting’s final sitting, the Employer Vice-Chairperson proposed to retain the original draft of paragraph 4, but replacing “normal job security” by “fundamental principles and rights at work”, which should be qualified by a footnote reference to the ILO Declaration on Fundamental Principles and Rights at Work and its Follow-up. The proposal was adopted.
527. The Government Vice-Chairperson proposed that the issue should be reviewed in future meetings based on practice. The proposal was adopted.

12.4. HIV and AIDS

528. The Worker Vice-Chairperson paid tribute to the ILO’s work on the topic.
529. The Employer Vice-Chairperson proposed to delete “and that the presence of a person living with HIV should not be considered a workplace hazard” at the end of paragraph 7, and to add “This is critical for first aid, medical and health workers”. The Worker Vice-Chairperson considered that, in view of paragraph 3 of the section, the amendment was redundant. The amendment was withdrawn. The section was adopted as drafted.

Acronyms, abbreviations and definitions

530. The Worker Vice-Chairperson proposed to add a definition of the word “training” to read: “*Training*: Either training or education or a combination of the two. In specific areas, certification or licensing as evidence as having received the necessary education and training may be a requirement.” The proposal was adopted.

531. The Government Vice-Chairperson enquired about the source of the definition of “small mine”. The Executive Secretary explained that the term had been used in the 1991 code; the definition found in the draft had been included in the 2006 *ILO code of practice: Safety and health in underground coalmines*. As “small mines” were sometimes misunderstood to also be part of the artisanal and small-scale mining subsector, a clarification had been added to that effect.

New text on falls from height and falling objects

532. At its final sitting the experts also had before them a draft text for a new section, which was added because consideration of subsection 9.6.7 (“Protection from falls”) had brought to light the need to address this issue separately. The draft text had been prepared by the Employer Vice-Chairperson and was submitted as a joint proposal by the Worker and Employer experts.

533. The Government Vice-Chairperson proposed that the term “Each mine” in the draft should be globally replaced by “The employer”. The proposal was adopted, and the new section adopted as amended.

Hazard description

Risk assessment

534. These subsections were adopted as drafted.

Control strategies

535. The Employer Vice-Chairperson proposed that, in paragraph 2, the term “1.8 metres” be replaced by “the height specified by national regulation (for example 1.8 metres is typical),”; and, in paragraph 14, the terms “national laws and approved standards so that workers” be replaced by “national laws, regulations and approved standards so that relevant persons ...”. These proposals were adopted. The rest of the new text was adopted without change.

Concluding remarks

536. The Worker Vice-Chairperson welcomed the adoption of the final text. The Meeting had worked hard, and had produced a code of practice that would improve workers’ lives, and indeed save them. It was a tribute to all those, including people he remembered, who had suffered injury or lost their lives in what was a highly dangerous occupation. He thanked the Government and Employer experts for their constructive approach and contribution of valuable experience.

537. The Employer Vice-Chairperson welcomed the new code, and hoped that it would in fact save lives and prevent injuries. He had personally witnessed and investigated many accidents, and their circumstances were always tragic. He paid tribute to the efforts of the Worker, Government and other Employer experts who had contributed their highly valuable combined knowledge to arrive at a text with maximum potential impact.

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- 538.** The Government Vice-Chairperson congratulated all the experts on their joint effort. Promoting OSH was not so much a job, more a vocation.
- 539.** The Chairperson thanked all the participants for their work. They had shown that, contrary to the saying, in this case people had more patience than paper.

Geneva, 20 October 2017