



COMMON MANAGEMENT SYSTEM

3

RISK MANAGEMENT

DATE: 24 JULY 2019



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1. OVERVIEW

This Standard describes IGO's Risk Management System. The purpose of IGO's Risk Management System is to ensure that risks are identified and understood, and that controls are implemented to manage these risks. Approval to undertake or conduct activities is to be provided by a level of authority commensurate with the assessed risk.

2. SCOPE

It is intended that the IGO Risk Management System address risks that do, or may:

- impede the Company from achieving its purpose
- impact on the Company's performance
- affect the health, safety or welfare of employees, visitors, communities and others in relation to the Company's operations
- impact on the community and the environment in which the Company operates
- impact on insurance arrangements
- threaten compliance with the Company's statutory obligations
- impact on the Company's reputation, or that of its people
- result in personal liability for Company officers arising from the Company's operations.

3. SYSTEM ELEMENTS

IGO's Risk Management System is comprised of a hierarchy of three risk management processes:

1. Business Critical Risk Management
2. Operational and Project Risk Management
3. Personal Risk Management.

3.1 Business Critical Risk Management Process

Business critical risks are those risks that have the potential to materially impact on our business. (The technical definition is provided in Appendix 1).

IGO will complete the identification and evaluation of business-critical risks and their associated treatment strategies in accordance with the following process:

- IGO's Executive Leadership Team (ELT) will review the 'hazards' posed to the business based on information arising from the Operational and Project Risk Management Process (see section 3.2) and external sources, to identify and rank the Business-Critical Risks, the control actions required, and define responsibilities
- The outcomes of the Business-Critical Risk Workshop will be documented, tracked and assessed for efficacy (i.e. the Business-Critical Risk Register)
- Business Critical Risk Reviews will be completed quarterly
- The material outcomes are to be presented to the Board's Sustainability and Risk Committee



3.2 Operational and Project Risk Management Process

Operational Risks are those risks that have the potential to materially impact on individual sites or projects. IGO will complete the identification and evaluation of Operational Risks and their associated treatment strategies in accordance with Appendix 5. This Standard:

- defines how Site & Project Risk registers are to be developed and maintained
- describes the tools used in IGO for completing operational risk assessments.

Each Operation or Project will maintain an Operational Risk Register using IGO DMS, Meercat or INX.

It is anticipated that both the Business-Critical Risk Management Process and the Operational Risk Management Process will identify the need for other IGO standards and procedures over time.

The selection of contractors poses a specific set of risks. For guidance refer to the **IGO Contract Risk Assessment Form**.

3.3 Personal Risk Management Process

Personal risk management is focused solely on the safety of individuals in the workplace. This process is defined in the **IGO Safety Risk Management Procedure**. This Standard defines how and when Safety Work Procedures, JSEAs and Take 5 are to be used.

3.4 Assessing Risk

IGO uses various tools and processes to complete risk assessments. Where a tool or process is specified by this Standard or other IGO procedures, the specified tool or process must be used. However, in all other cases, IGO shall identify and use such tools or processes as deemed fit-for-purpose.

Notwithstanding the various tools or processes available for use, the output of these processes must be standardised to conform to the IGO Consequence-Likelihood-Risk Model.

4. IGO CONSEQUENCE-LIKELIHOOD-RISK MODEL

For clarity of communication, IGO uses a standard methodology to categorise risk. This methodology, known as the IGO Consequence-Likelihood-Risk Model, is described in Appendix 1. As an outcome of the application of this model, all risks are deemed to fall within one of the following five categories:

IGO Risk Categories	Very low risk	Minor risk	Moderate risk	Major risk	Catastrophic risk
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5. RISK APPETITE

Central to the success of our business is the pursuit of opportunities that, by their very nature, require the acceptance of some risk. At IGO, we place constraints on the level of risk that our Company officers are permitted to assume or take.

As a general rule, IGO will not take actions, nor are any of its employees or agents authorised to take any action, or through omission permit circumstances, in which IGO assumes or takes a risk that is assessed to fall within the IGO Risk Category - "Catastrophic Risk", as defined by the IGO Consequence-Likelihood-Risk Model.

IGO may, subject to the proper review and implementation of appropriate controls, and subject to the appropriate level of authorisation, take risks categorised at a level lower than "Catastrophic Risk".



It should be noted that IGO imposes a higher standard (i.e. is less risk tolerant) with regard to the management of Occupational Health, Safety, Environment and Community (HSEC) risk.

Specifically, IGO will not permit or accept circumstances in which the potential HSEC risk is assessed to fall within the IGO Risk Categories - "Major Risk or Catastrophic Risk".

Approval to undertake or conduct activities with associated risk is to be provided by a Company officer, or delegate, with a level of authority commensurate to the assessed risk. Risk management authorities are specified in the **IGO Group Governance Standard 1 - Corporate Control** and IGO's various HSEC standards.

6. RISK AND CAUSE IDENTIFICATION

Irrespective of the risk tools used, the accurate identification of risks and their causes is critical to any risk management process. Each of the IGO risk tools must have supporting procedures that recommend methods for identifying risks and causes. Key, and common, to all of these is the requirement to involve people with experience in the area where the risk assessment is being undertaken.

7. IMPLEMENTATION OF EFFECTIVE CONTROLS

Risk management is only effective if controls, identified as part of the risk process, are effective and physically implemented. In respect of HSEC, the hierarchy of controls must always be considered when selecting effective controls.

IGO will establish standards specific to the control of 'Defined Hazardous Work' (Refer to **IGO Group Safety Standard 14 - Defined Hazardous Work and Permit to Work**).

8. RISK REDUCTION ACTIONS

Common to all risk management activities is the identification of risk reduction actions. These may require the establishment and implementation of new controls or the modification or change to existing controls. Common to all is the need to clearly articulate the actions, identify a responsible person for managing each action, and specify the due date for each action to be completed.

IGO uses Meercat Risk Management Software and INX for its action register for operational risk management.

Actions arising from the JSEA process typically require the physical inspection of the job by a supervisor to confirm the controls are adequately in place.

9. TRAINING

Personnel will receive hazard identification, risk and assessment training appropriate to their roles and responsibilities.

10. RISK MANAGEMENT SYSTEM OVERSIGHT

The oversight of the IGO Risk Management System occurs at four levels of the organisation:

- Board Sustainability and Risk Committee
- Executive Leadership Team (ELT)
- site and project management
- line management.



The function and responsibilities of the Board Sustainability and Risk Committee are defined in the Board Sustainability and Risk Committee Charter.

ELT members are responsible for:

- development of the **IGO Risk Management Policy**
- development and maintenance of this **IGO Common Management System Standard 3 - Risk Management**
- verification of the effectiveness of critical controls
- improvement and corrective action tracking.

Additionally, ELT will:

- Ensure management has standards in place to control HSEC risks, and specifically for 'Defined Hazardous Work'
- Ensure that site and project management have controls in place for unusual types of transactions and/or any potential transactions that may carry more than an acceptable degree of risk
- Review and report to the Board on the risk management disclosure in the Company's annual report, and all other risk management information published by the Company or released to the market
- Ensure that procedures for the protection of whistleblowers are adequate (refer to **IGO Group Governance Standard 5 - Whistleblower Protection Standard**)
- Review and report to the Board on material non-compliance with legislation and regulations across the Company
- Evaluate the Company's exposure to fraud and oversee investigations of allegations of fraud or malfeasance in collaboration with the Board Audit Committee.

Operational and Project Management are responsible for ensuring that:

- prescribed risk assessments are completed
- results are reviewed at site/project management level
- findings are reported to and corrective actions by their ELT representative.

11. REPORTING TO THE IGO BOARD

ELT will report all 'Critical' and/or 'Catastrophic' risks to the Board, and all actual events classified as 'Major', 'Critical' and/or 'Catastrophic' to the Board.

12. RELATED DOCUMENTS

- **IGO Risk Management Policy**
- IGO Group Governance Standard 1 - Corporate Control
- **IGO Group Governance Standard 5 – Whistleblower Protection Standard**
- IGO Group Safety Standard 14 - Defined Hazardous Work and Permit to Work
- **IGO Safety Risk Management Procedure**
- **IGO Contract Risk Assessment Form**

APPENDIX 1: IGO CONSEQUENCE-LIKELIHOOD-RISK MODEL

For clarity of communication, IGO uses a standard methodology to rank and categorise risk. This methodology, known as the IGO Consequence-Likelihood-Risk Model, is used for the purpose of categorising all risks into one of the following five categories.

IGO Risk Categories	Very low risk (1-6)	Minor risk (7-10)	Moderate risk (11-15)	Major risk (16-19)	Catastrophic risk (20-25)
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The IGO Consequence-Likelihood-Risk Model is used by means of the following steps:

1. The first step in any risk assessment is to identify hazards; the things, processes or circumstances that have the potential to give rise to some undesired consequence
2. The next step is to assess the potential consequence associated with the hazard (not the worst possible consequence but rather the most credible consequence) using the Categories of Consequence Table is presented in Appendix 2
3. The next step is to assess the likelihood of the event that causes the consequence using the Categories of Likelihood Table is presented in Appendix 3
4. Given that a Consequence category and Likelihood category is assigned to a given hazard, using the Risk Assessment Matrix presented in Appendix 4, a Risk Ranking (a number between 1 and 25) is determined
5. Using the Risk Ranking number, a Risk Category is assigned:

Risk Ranking	Risk Category
between 1 and 6	'Very Low Risk'
between 7 and 10	'Minor Risk'
between 11 and 15	'Moderate Risk'
between 16 and 19	'Major Risk'
between 20 and 25	'Catastrophic Risk'

Business-Critical Risk

A Business-Critical Risk is defined as any risk that:

- has an IGO Risk Category of 'Major Risk' or 'Catastrophic Risk', or
- has a 'Catastrophic' Category of Consequence (Appendix 2).

APPENDIX 2: IGO CATEGORIES OF CONSEQUENCE TABLE

Severity of Consequence	Type of Consequence					
	Health	Safety	Environment	Community & Reputation	Financial Loss or Exposure	Compliance
5 - Catastrophic	<ul style="list-style-type: none"> Chronic exposure of numerous employees to elevated levels of Class A carcinogen or similarly hazardous material resulting in disease A widespread outbreak of infectious disease. 	<ul style="list-style-type: none"> Fatality Permanently disabling injury 	<ul style="list-style-type: none"> Widespread environmental damage. Extinction or a credible risk of species extinction. Destruction or a credible risk of destruction of a listed ecosystem 	<ul style="list-style-type: none"> Very serious widespread social impacts causing site closure Irreparable damage to highly valued structures/items/locations of cultural significance Government or police intervention in operations Operations/production stopped by community action Prolonged or national media focus on the Company's activities or impacts Community fatality as a direct consequence of IGO's actions 	<ul style="list-style-type: none"> loss of >\$100M cash flow loss of > 25% market capitalisation 	<ul style="list-style-type: none"> Prosecution resulting in imprisonment of Company officer, or Suspension of the operating licence of a mine
4 - Critical	<ul style="list-style-type: none"> Chronic exposure of numerous employees to elevated levels of Class A carcinogen or similarly hazardous material - no symptomatic disease A localised outbreak of infectious disease among numerous employees. Numerous employees demonstrate symptoms of an industrial disease (e.g. functionally significant hearing loss) 	<ul style="list-style-type: none"> Serious Injury (LTI of greater than 2 weeks) Permanent partial disability 	<ul style="list-style-type: none"> Environmental damage extending beyond IGO's land tenure. A material threat to listed species Destruction or a credible risk of destruction of listed biological communities 	<ul style="list-style-type: none"> Ongoing serious social issues Significant damage to structures/items of cultural significance Significant infringement/disregard of cultural heritage Aggressive action causing restrictions on operations Protestors on IGO property External arbitration required Limited short-term national media focussing on the Company activities or impacts Community fatality where IGO is seen as having some responsibility (e.g. contractor hauling our product from a site). 	<ul style="list-style-type: none"> between \$10M to \$100M loss of between 15% and 25% market capitalisation 	<ul style="list-style-type: none"> Prosecution of the business for breach of the law, or Material non-compliance with the law as identified by a Company officer requiring disclosure and for which no immediately remedy is available, or Breach of Code of Conduct, or Breach of Critical Safety Control
3 - Major	<ul style="list-style-type: none"> Chronic exposures that require an extended period (> 2 weeks) of alternate duties to alleviate symptoms. 	<ul style="list-style-type: none"> Lost time injury (LTI) 	<ul style="list-style-type: none"> Extensive unapproved environmental damage within IGO's property boundaries (>10 ha). A credible threat to listed species or ecosystems Nuisance impact (e.g. dust, noise) to neighbours resulting in a complaint(s) or investigation by a regulator 	<ul style="list-style-type: none"> Ongoing social issues Minor damage to structures/items of cultural significance Infringement/disregard of cultural heritage/sacred locations Strong community complaints/reaction: a threat to operations; small scale protests near operating sites Isolated national media on the event Local media attention 	<ul style="list-style-type: none"> between \$500k to \$10M attributable loss of market capitalisation but <15% 	<ul style="list-style-type: none"> Regulators issue corrective action directives, or Material non-compliance with the law as identified by Company officer for which no immediately remedy is available (> 1 month), or Major non-compliance with Company policy or procedures.
2 - Significant	<ul style="list-style-type: none"> Exposures that require a short period (<2 weeks) of alternate duties to alleviate symptoms. 	<ul style="list-style-type: none"> Injury requiring medical treatment (MTI) and/or An injured person required to complete alternative or restricted work duties (RWI) 	<ul style="list-style-type: none"> Significant environmental impact (between 1 and 10 ha) within IGO property. Impact to flora/fauna localised and contained (single animals and plants) 	<ul style="list-style-type: none"> Minor social/cultural impact Damage or loss of minor community asset Minor infringement of cultural heritage No media coverage or some isolated local media discussion 	<ul style="list-style-type: none"> between \$20K to \$500K 	<ul style="list-style-type: none"> Statutory non-compliance identified by Company officer requiring more than a month to remedy, or Statutory non-compliance identified by Company officer requiring external disclosure Non-compliance with Company policy or procedures, requiring more than a month to remedy.
1 - Minor	<ul style="list-style-type: none"> Working conditions or impacts causing discomfort or physical strain that may result in industrial disease (e.g. continuous exposure to vibration) immediately alleviated by changes in work method 	<ul style="list-style-type: none"> First aid or minor supportive treatment 	<ul style="list-style-type: none"> Minor environmental impact (<1ha) within IGO property Impact to flora/fauna localised and contained (single animals and plants) 	<ul style="list-style-type: none"> Communication of complaint or concern (letters, emails, social media, telephone calls, etc) from an external party. 	<ul style="list-style-type: none"> <\$20K 	<ul style="list-style-type: none"> Statutory non-compliance identified by Company officer for which an immediate remedy is available, or Non-compliance with Company policy or procedures.

APPENDIX 3: IGO CATEGORIES OF LIKELIHOOD TABLE

Likelihood	Description
Almost Certain	The activity or action associated with the potential event occurs on a daily basis
Likely	The activity or action associated with the potential event typically occurs once per month or more frequently
Possible	The activity or action associated with the potential event typically occurs once per year or more frequently
Unlikely	The activity or action associated with the potential event typically occurs once every few years or more frequently
Rare	The activity or action associated with the potential event has not occurred in the last 10 years

APPENDIX 4: IGO RISK ASSESSMENT MATRIX

		Likelihood				
		Rare	Unlikely	Possible	Likely	Almost Certain
Consequence	Minor	1	2	4	7	11
	Significant	3	5	8	12	16
	Major	6	9	13	17	20
	Critical	10	14	18	21	23
	Catastrophic	15	19	22	24	25

The use of the IGO Risk Matrix for a given Likelihood and Consequence provides a Risk Ranking (a number between 1 and 25). The Risk Ranking is then used to define a risk category as follows:

Risk Ranking	Risk Category
between 1 and 6	'Very Low Risk'
between 7 and 10	'Minor Risk'
between 11 and 15	'Moderate Risk'
between 16 and 19	'Major Risk'
between 20 and 25	'Catastrophic Risk'

APPENDIX 5: OPERATIONAL RISK MANAGEMENT

Site Risk Registers

Each IGO Site or Project must have a Risk Register. The register must:

- be captured in IGO's enterprise risk software (Meercat)
- capture, among other risks, the most significant safety risks faced by the site (referred to as Business-Critical Safety Risks), and the Critical Controls (refer to **IGO Safety Risk Management Procedure**) for the management of these risks
- be based on, and supported by, such discipline specific Operational Risk Assessments as determined as necessary by site management (outlined within this Appendix)
- be reviewed at least quarterly by the site management team.

Operational Risk Assessments

Any significant change to operations, plant, process or mine design must be subject to either internally facilitated 'Operational Risk Assessments' or, in the case of very large-scale changes, externally facilitated Hazard Identification Studies (HAZIDS) and Hazard & Operability Studies (HAZOPS). Operational Risk Assessments generally should take the form of bowtie risk assessments or should use the **IGO Operational Risk Assessment Template**.

Operational Risk Assessments must be specifically completed for the following (not this is not an exhaustive list):

- Confined Spaces. Sites must determine which spaces can be effectively managed with the site's generic access and emergency response plans, and those that present specific complexity requiring additional space specific planning (refer to **IGO GSS 14 – Defined Hazardous Work & Permit to Work**).
- Mine Design. The geotechnical and inrush prevention elements of mine design and management (refer to **IGO GSS 17 - Inrush and Outburst** and **IGO GSS 10 – Ground Control**).
- Traffic Management. Sites must specifically examine hazards and controls associated with pedestrians, light vehicle and heavy vehicle interactions. The outcomes of this risk assessment must be used to inform the development of the site Traffic Management Plan. (Refer to **IGO GSS9 – Traffic, Road Travel & Mobile Plant Management**).

Hazard Identification Studies (HAZIDS)

Sites and projects must complete Hazard Identification Studies (HAZID); a) as part of the design process for any new site, mine, or processing and related facilities, and b) where material changes to site layout, mining method, or processing and related facilities are planned.

Hazard identification studies follow a widely used methodology that must be led by a trained facilitator. Central to the process, are structured workshops (sequential brainstorming sessions for the execution of the scope of works) typically involving both contractor and IGO personnel from the engineering disciplines, project management, commissioning, operations and HSEC personnel.

Hazard identification studies must be completed as early in the project cycle as practical. Typically, this is as soon as mine design, process flow diagrams, draft heat and mass balances, and plant layouts are



available. Existing site infrastructure and operations, weather and other environmental factors, and expert technical opinion must also be explicitly considered.

Hazard and Operability Studies (HAZOPS)

Hazard and operability studies (HAZOPs) must be completed following the substantial completion of process plant design or production processes where:

- such studies are a legislated requirement
- the plant is designated a 'major hazard facility' or similar
- the plant incorporates either hydrometallurgical processes or hazardous materials in metal recovery.

HAZOPS shall be completed only once designs are unlikely to change significantly. HAZOPs must focus on the foreseeable variations within the process, the hazards that may arise and the likely efficacy of the hazard control measures.

HAZOPs adhere to a defined methodology based on a facilitated expert team review. HAZOPs can only be completed once the piping and instrumentation diagram (P&IDs) have been completed.

Standardised guide-words and process parameters should be utilised by the HAZOP team to identify potential deviations from the design intent. For each deviation, the team identifies feasible causes and likely consequences to determine the adequacy of existing safeguards, or whether additional controls must be added to reduce the risks to an acceptable level.

At IGO HAZOPs must be overseen by an independent, trained HAZOP facilitator who is responsible for the overall quality of the review.