



SAFETY MANAGEMENT SYSTEM

KOORAGANG ISLAND

JANUARY 2023



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1 INTRODUCTION

Orica Australia Pty Ltd (Orica) operates a manufacturing facility at Kooragang Island, Newcastle, NSW that produces ammonia, nitric acid and ammonium nitrate (Figure 1). The facility commenced operations in 1969 and there have been several increases to production capacity at the site, with the current operation including an Ammonia Plant, three Nitric Acid Plants, two Ammonium Nitrate Plants and associated despatch and support infrastructure.



Figure 1: Site Location

The site operates under Orica's Safety, Health, Environment and Security Management System (SHES MS), which includes objectives, procedures and performance standards under which the hazards associated with the operations are managed and performance measured. This report summarises the key components of the SHES MS.

2 CORPORATE SHES MANAGEMENT SYSTEM

2.1 VALUES

Orica's SHES Management System (SHES MS) is critical in achieving a culture of safety.

The SHES MS underpins how Orica does business and manages its material SHES risks. The SHES MS aligns to the Orica Charter values and our strategy where "Safety is our priority. Always." and "We respect and value all." finding ways to minimise our environmental impacts in all our actions.



Safety is our priority. Always.

The most important thing is that we all return home, safely, every day.

- ▶ We care and take accountability for everyone's safety and wellbeing, including our own.
- ▶ We recognise the risks we face in our work and follow all safety controls.
- ▶ We speak up when we see hazards or causes of potential harm.



We respect and value all.

Our care for each other, our customers, communities and the environment builds trusted relationships.

- ▶ We treat everyone fairly, with dignity and we value diversity.
- ▶ We work with our local communities to contribute positively.
- ▶ We find ways to minimise our impact on the environment in all our actions.

Figure 2: Orica's Values

2.2 STRATEGY

Orica's strategy for meeting its SHES commitments and for achieving the Values is to have in place:

- Equipment and materials that are designed and maintained fit for purpose
- Well communicated principles and behaviours that promote continuous SHES performance improvements through leadership and personal responsibility
- A SHES Management System with systems of work that ensure control measures are sustained.

The strategy illustrates the Orica SHES Management concept and its ultimate goals, as well as highlighting the interrelated nature of associated activities and the tools, techniques and activities that are available. This is shown in Figure 3.

SHES MANAGEMENT SYSTEM



Figure 3: Summary of SHES Management System Hierarchy

Central to Orica's strategy is that:

- SHES is a line management responsibility. Ownership and accountability for SHES performance is embedded in the line at all levels and line managers are responsible for providing SHES leadership and for development and implementation of SHES management plans for their areas of responsibility.
- There is a consistent risk-based approach to SHES management with appropriate emphasis on high severity, low probability events as well as low severity, higher probability events. Resources are allocated and activities prioritised on the basis of risk, and
- Appropriate training is in place to equip all personnel to carry out their tasks so as to take care of themselves, others and the environment.

2.3 SHES POLICY

The Orica Limited Board have endorsed the company Safety, Health, Environment and Security Policy (Appendix 1). The policy clearly communicates the commitment and aspirations of top management and form the basis to enable the vision and values.

The policy states that:

Together, we are committed to managing our operations and associated activities in a safe, secure and sustainable manner. We care for the environment as well as the health and safety of our people, customers and our communities. Safety, Health, Environment and Security (SHES) are essential to our business success and are foundational to Our Charter. Personal ownership through visible and felt leadership and individual responsibility at all levels is essential to our success.

2.4 SHES GROUP STANDARDS

The SHES Group Standards document the mandatory, minimum requirements that Orica facilities must comply with. There are six SHES Group Standards, which support the SHES Policy and Orica's 'Our Charter' and are shown in Figure 4 and described below.



Figure 4: SHES Group Standards

- GS.21 Environment

The Environment Group Standard sets out the activities and approvals required to effectively and consistently manage the environmental obligations of Orica sites and operations. The Environment Group Standard establishes a framework to identify and assess how Orica's operations can impact the environment and what controls are needed to effectively mitigate potential adverse environmental impacts.

- GS.30 SHES Management

The SHES Management Group Standard sets out the minimum performance requirements for the SHES Management Systems and processes which help to support the remaining SHES Group Standards (Personal Safety, Process Safety, Health, Environment and Physical Security). The SHES Management Group Standard is applicable to all Orica employees and contractors.

- **GS.31 Personal Safety**

The Personal Safety Group Standard describes the minimum requirements for managing personal safety risks which relate to all Orica employees and contractors and which may result in significant injury or fatality.

- **GS.32 Process Safety**

Process safety is a disciplined framework for managing the integrity of operating systems and processes for the handling of hazardous materials by applying good design principles, engineering and operating practices. It deals with the potential to release hazardous energy or hazardous materials. This may result in process safety material risk events (major hazards) that can cause fire, explosion or toxic effects that can ultimately result in fatality, property damage, business interruption and environmental harm.

Process safety management focuses on prevention of, preparedness for, mitigation of, response to and restoration from catastrophic release of hazardous energy or hazardous materials. It comprises the design, procedures and hardware needed to operate and maintain process safety throughout the operational lifecycle.

- **GS.33 Health**

The Health Group Standard sets out the activities and approvals required to effectively and consistently manage the health of Orica employees and contractors. The Health Group Standard considers a variety of health impacts and the controls needed to mitigate these impacts. It is broad in its application across many activities such as activities on operating sites, travel for work, managing injuries which may have occurred to an Orica employee on an Orica site, customer site or office.

- **GS.34 Physical Security**

The Physical Security Group Standard sets out the activities required to effectively and consistently protect all Orica employees, contractors, asset and product security. It does not cover intellectual property security and IT security.

2.5 SHES GROUP PROCEDURES

The SHES Group Procedures provide further detail on how Orica's sites are required to comply with the specific performance requirements or elements of the applicable group standard. The group procedures related to each standard are detailed below, although some procedures support more than one standard:

GS.21 Environment

- Aspect and Impacts Assessment Group Procedure
- Environmental Management Plan Group Template

GS.30 SHES Management

- Crisis Management Group Procedure
- SHES Assurance Group Procedure
- SHES Emergency Management Group Procedure
- SHES Event Management Group Procedure
- SHES Hazard Studies Group Procedure
- SHES Management of Change Group Procedure
- SHES Permit to Work Group Procedure
- SHES Risk management on operating sites Group Procedure

GS.32 Process Safety

- Process safety for continuous manufacturing sites Group Procedure

- Process safety for explosives and their precursors Group Procedure
- Process safety for initiating systems Group Procedure
- Process safety for packaged explosives Group Procedure
- Transport of Dangerous Goods Group Procedure

2.6 LOCAL OPERATING PROCEDURES AND WORK INSTRUCTIONS

Where local site circumstances require more detailed allocation of responsibilities than that provided by the SHES MS Procedures, or there are specific local requirements, a customised local procedure or supplementary work instruction is produced to:

- define local responsibilities,
- reflect/reference existing local procedures,
- add required local "how to" details, and
- identify the records of activities required for the desired level of auditability (traceability).

Customised local procedures must be consistent with the complexity of the activity, the level of risk involved and the skills and training of the people performing the activity.

Site-specific procedures are maintained on the Orica Enterprise Library (OEL), the company document management system.

3 SHES ROLES AND RESPONSIBILITIES

The SHES leadership, guidance and direction of the company is provided at three levels:

Level 1	Group Executive
Level 2	Group SHES Team and Regional Management Team
Level 3	Site/Business Management Team

The Group SHES Team provides technical policy and strategy support and advice to the Group Executive. The Regional Management Team oversees the implementation of the SHES MS across the regional area.

3.1 ORICA GROUP EXECUTIVE

The Orica Group Executive, in association with the Group SHES Team, is the forum for strategy development and for safety, health, environment and security governance of the company. The Group Executive drives SHES performance improvement throughout Orica.

In particular, the Group Executive:

- recommends the safety, health, environment and security policy to the Board;
- approves the strategy and sets performance targets;
- monitors SHES compliance and governance through audit reviews;
- endorses actions to address company-wide improvement opportunities; and
- endorses company positions on significant external SHES issues at governmental and industry associations.

3.2 SITE MANAGEMENT TEAM

The Site Management Team is accountable for the implementation of the SHES MS at the site.

Site management teams are supported by:

- the Group SHES Team,
- Regional SHES Team, and
- Site based SHES specialists.

The Site Management Team reviews SHES performance at daily morning meetings, daily production meetings and weekly management team meetings. In addition, a management team member is on-call after-hours to assist in responding to SHES incidents.

3.3 SAFETY LEADERSHIP INTERACTIONS

Orica is committed to improving the safety culture at all levels of the organisation and one of the activities that supports this is the safety leadership interaction (SLI) program. The program is built on humility, curiosity and empathy. It enables leaders to gain insight into how they can support their people to find better ways of working safely, efficiently and productively.

SLI's involve face-to-face discussions between leaders in the organisation, at all levels, and frontline workers about safety and their work. These two-way conversations are focussed on learning, relationship building, coaching and continual improvement. They focus on work-as-done through direct observation of work and conversations with those performing the work at the frontline.

The interactions are recorded in Enablon and are reviewed on a regular basis to identify trends in the interaction findings. Corrective actions or opportunities for improvement identified in the SLIs are raised in Enablon. The management team reviews key SLIs on a regular basis and the Site Management Team and their direct reports are encouraged to participate in the program, with the number completed a KPI in monthly reports.

4 MANAGEMENT OF LEGAL AND OTHER REQUIREMENTS

Orica is committed to ensuring that its operations comply with the legal requirements of the countries in which it operates. Group Standard 30: SHE Management states that legal requirements must be:

systematically identified, evaluated, accessible, communicated, kept current and complied with in order to protect Orica's licence to operate.

Orica's Group SHES Team and Senior Legal Counsel – SHES assist the site in identifying legal requirements and standards that are applicable to the operations. Where key activities or tasks are required to be completed these are included in Enablon to track their completion.

In addition, Orica subscribes to services that advise of changes to safety and environmental legislation and changes to standards and codes of practice to assist in ensuring that the requirements are identified, and measures put in place to ensure compliance.

4.1 LEGAL REQUIREMENTS

At the Kooragang Island site technical specialists have been nominated to be responsible for maintaining the systems that ensure compliance with legal requirements. The SHES Team maintains details of compliance requirements with regulatory obligations and licences. Performance against the requirements is regularly reviewed. In addition, site registers for safety and environmental legal requirements are available on the OEL and maintained by the SHES Team.

Access to legal requirements is maintained electronically, either by external websites, the site's OEL where copies of licences are maintained or through Enablon. Enablon is Orica's SHES data management and reporting system and includes a regulatory compliance module.

4.2 STANDARDS AND CODES OF PRACTICE

The requirements of standards and codes of practice are incorporated into site specific procedures or work processes, where appropriate.

5 SAFETY OBJECTIVES, PLANS AND TARGETS

5.1 ORICA SHES REPORTING

Orica develops safety objectives on a regular basis as it drives towards achieving 'Our Charter' and the SHES Policy through continuous improvement in our SHES performance. A series of SHES objectives are developed by the organisation to ensure that it continues to move Orica along the path towards business sustainability. The SHES related objectives include targets related to:

- Major hazard management, including the number of fatalities, the serious injury case rate, high potential incidents, key control verifications;
- SHES MS, including occupational illness/disease monitored via KPI's including recordable injuries, and all worker recordable case rate, environmental incidents, product security, environmental non-compliances and distribution incidents;

- Felt visible leadership, including, safety leadership interactions and job cycle checks; and
- Climate Change, including carbon emissions intensity.

5.2 SHES PERFORMANCE MONITORING

SHES performance is reviewed on a monthly basis by the Kooragang Island Management Team. Performance metrics reviewed include:

- SHES performance, including serious injuries, recordable injuries, high consequence incidents, environmental non-compliance, loss of containment, on-time completion of critical/high and medium priority action plans and safety leadership interactions (Power BI report Group SHES Monthly – Cont MFG – Kooragang Island)
- Inspections completed, including mKCVs, permit to work audits, job cycle checks and field checks (Power BI report Group SHES Monthly – Cont MFG – Kooragang Island)
- Process safety metrics, including challenges to safety systems and leading indicators (Power BI report CM Process Safety Metrics)
- Key parameters associated with the Management of Change system (Power BI report KI MoC Weekly Report)

Selected information from these reports is also reviewed with the site Occupational Safety, Health and Environment Committee on a monthly basis.

6 TECHNICAL SAFETY MANAGEMENT

At Orica, our people and the expertise that they hold are key to the safety and success of our customers and employees. Orica recognised the importance of capturing and institutionalising this expertise and as a result there are seven Expert Panels, whose role is neatly encapsulated as “Be the safety conscience of the business”, and their task is to capture and maintain expert knowledge of events which, if realised, would result in serious injuries or fatalities within our operations or from the use of Orica’s products. Panel members are recognised subject matter experts and Panel Leaders meet regularly to ensure alignment. SHES representatives assist at all meetings.

Key responsibilities of the panels include establishing and maintaining Basis of Safety documents, governing the content of relevant Group Standards and Procedures, participating in SHES and Basis of Safety audits when requested, and guiding the selection of new technology.

The Ammonium Nitrate, Nitric Acid and Ammonia Expert Panel is relevant to the Kooragang Island site.

Accountability for the overall operation of the Expert Panel rests with the panel Sponsor, who is a member of the Executive Committee.

7 PROCESS SAFETY MANAGEMENT

7.1 BASIS OF SAFETY (BOS)

The Expert Panels, described in Section 6 have developed Basis of Safety documents for all major hazard manufacturing processes in accordance with Group Standard 32: Process Safety. A Basis of Safety program relates to the prevention of major incidents such as fires, explosions, toxic gas releases and fatal incidents.

The key elements of it are:

- Identification of the major hazards (including knowledge gained from incidents and industry experience - the corporate memory of the operation); and
- Incorporation of Basis of Safety knowledge into safety-related processes and communications and training modules so that it becomes living knowledge.

The Basis of Safety is reviewed and updated to incorporate learnings from incidents that occur at both internal and external manufacturing facilities globally, with training mandatory for plant and maintenance technicians, plant engineers/technologists and SHES specialists.

7.2 CHEMICAL STORAGE

Information on the location and quantity of chemicals stored at the site are detailed in the OEL in the Notification of Dangerous Goods section or can be accessed via the Emergency Services Information Package in the Emergency Plan.

Chemicals stored and utilised at the site in significant quantities include, but are not limited to:

- Ammonia (anhydrous and aqueous)
- Nitric acid
- Ammonium nitrate
- Natural gas
- Methyl-diethanolamine (MDEA)
- Aluminium sulphate
- Sulphuric acid

- Caustic soda

7.3 PROCESS MATERIALS

Safety Data Sheets (SDSs) are required for all products, intermediates, raw materials, consumable chemicals, aids to manufacture, catalysts, laboratory chemicals and hazardous chemical wastes. The SDSs are available on ChemAlert and are accessible by workers with a computer login at the KI site.

Hazardous substances are stored in accordance with regulations and standards and reported on to SafeWork NSW in accordance with the Work Health and Safety Regulation 2017.

Chemicals brought to site are assessed to ensure they are suitable for use onsite and to identify the controls, if required, that are to be used to manage them.

7.4 HAZARDOUS AREA CLASSIFICATION

Hazardous areas at the site are classified in accordance with *AS60079:10.1:2009 Explosive Atmospheres – Classification of areas – Explosive gas atmospheres*. Registers of hazardous areas are maintained at the site and can be accessed from the drawing management system (AutoVault) and in the Maintenance Engineering Sharepoint site.

The management of change process includes the assessment of the impact of a change on the hazardous area classification.

7.5 ENGINEERING DRAWING MANAGEMENT

The site has in place systems for the management of engineering drawings, including Engineering Line Diagrams, Process Flow Diagrams, Isometric Piping Diagrams and construction drawings. Proprietary software (“Autodesk Vault”) is used for the management of the engineering drawings.

This includes the control of drawing versions, approval of drawings and updating of drawings as part of the management of change processes.

The Drafting Lead at the site is responsible for the control of engineering drawings. The OEL contains procedures for the management of engineering drawings, covering issues such as assignment of engineering drawing numbers, drafting procedures, updating of engineering line diagrams and accessing the engineering drawings.

8 HAZARD ANALYSIS AND RISK ASSESSMENT

8.1 HAZARD IDENTIFICATION AND RISK ANALYSIS

The systematic identification, assessment and management of safety, health, environmental and security risk is essential to the successful undertaking of Orica’s activities. A risk assessment methodology is applied to all aspects of the operations, including new projects, modification of existing plant, periodic reviews of existing operations and the assessment of risk in undertaking activities such as maintenance tasks. Safety, health, environmental and security risks associated with the activity are considered in all of these reviews. This approach is documented in the Group Standards 30: SHE Management and 32: Process Safety and the SHES Hazard Studies Group Procedure.

The Group Standards and Procedures refer to a 'bowtie' process for representation of major incidents and an updated risk matrix. The new documents also define 'key controls' that complement and, in some cases, overlap the site defined 'critical controls'. The Kooragang Island site however still uses the hazard identification, risk assessment and control (HIRAC) methodology rather than bowties for the safety assessments.

The relationship between the various Hazard and Risk Assessment tools utilised by Orica in the management of both new plant and equipment and the review of existing plants is detailed in Figure 5.

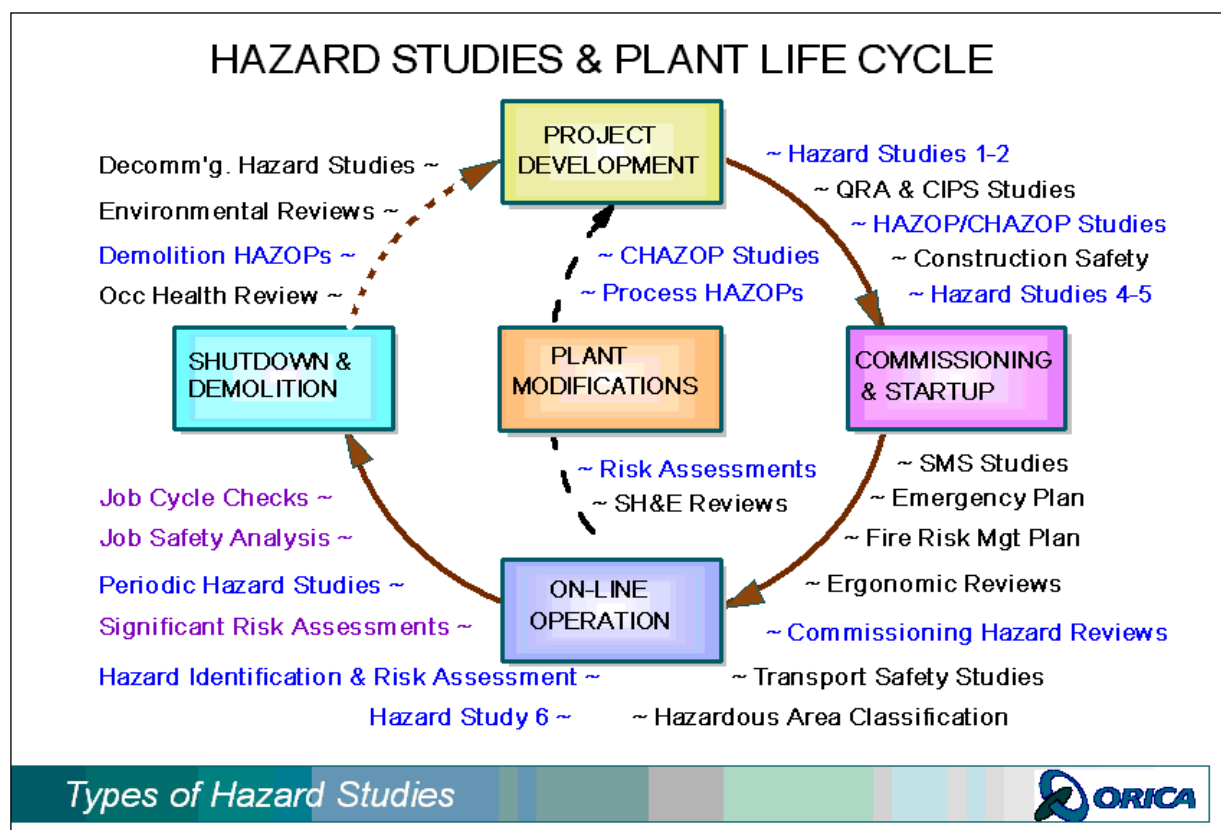


Figure 5: Overview of Orica Risk Management Processes

The hazard assessment tools cover new plants or major modifications, reviewing of existing operations and task-based hazard assessments. Figure 6 details the relationship of each of these tools to the hazard and risk processes.

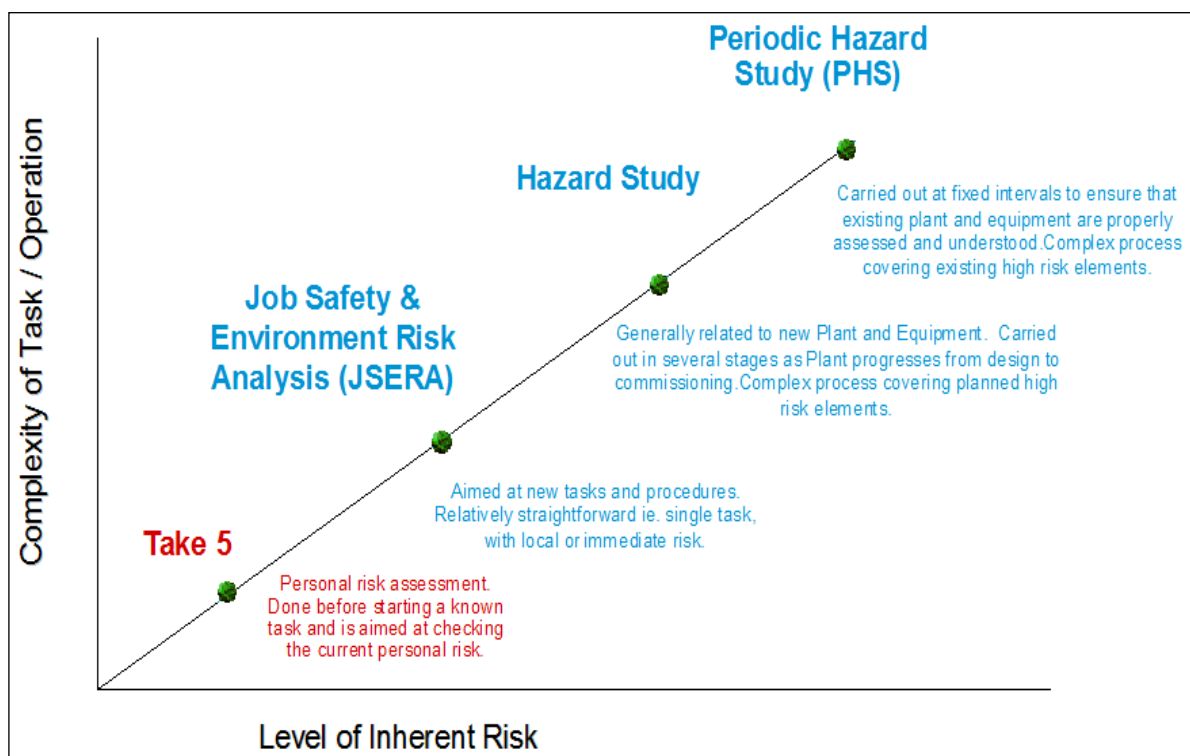


Figure 6: Relationship of Hazard Studies to the Plant Life Cycle

8.2 NEW PLANTS OR MAJOR MODIFICATIONS

Where new plants or major modifications occur the Orica hazard study process, or the site periodic hazard study process, is utilised to assess the hazards. These are described in the sections below.

8.2.1 HAZARDS STUDIES

Orica has a series of six studies to assist in identifying and controlling potential risks associated with a project or plant modification. They focus mainly on moderate to major potential hazards and are undertaken in relation to projects and other engineering changes and enable Orica to meet its safety, health, environmental and security targets in any planned or current business activity. Depending upon the size, cost and risks associated with the development all, or just selected studies, will be undertaken.

The studies are facilitated by a hazard study leader approved by the site's Senior Safety Specialist - MHF. The hazard study leader takes a multi-disciplinary team through a formal review process using targeted guidewords.

The six studies include:

- **Hazard Study 1.** The purpose of this study is to ensure that the understanding of the activity and the materials involved, is sufficient to enable SHES hazards to be thoroughly assessed. It also contributes to key policy decisions (e.g. on siting) and ensures that contacts are established with the functional groups, site management and the regulatory authorities who may contribute to, or impose constraints on the change. It identifies the need for and sets the scope for further hazard studies or specialist hazard studies.
- **Hazard Study 2.** This study is performed at the early Project Definition stage. The purpose of this study is to identify hazards and to provide the opportunity for their elimination by

design. Where this is not practicable, controls may need to be incorporated into the design to meet the SHES requirements and objectives.

- Hazard Study 3. This is the Hazard and Operability Study (HAZOP). It is performed at the end of the project detailed design stage to identify hazard and operability problems via a detailed look at the design. The purpose of this study is to review the design and/or procedures to identify any hazards or obstacles to operability which could arise, particularly through deviations from the design intent. In the case of process plant this will be based on the study of engineering diagrams and an outline of operating procedures. The consequences of deviations are to be identified during this study and corrective actions or measures initiated.
- Hazard Study 4. This study is performed towards the end of the construction stage for each separate system or plant section. The purpose of this study is to check that the:
 - project or change has been implemented to the intended design;
 - actions from previous hazard studies have been incorporated into the design and are completed; and
 - operating instructions and emergency procedures comply with any requirements identified by previous hazard studies and are satisfactory for the safe operation of the plant.
- Hazard Study 5. This study is performed at the end of the overall construction stage but before process materials are introduced for operation. The purpose of this study is to provide an opportunity for those effecting the change and the people impacted by it to validate that the detailed implementation of the change meets applicable company and regulatory requirements and has not introduced unforeseen SHES hazards.
- Hazard Study 6. This study is performed 3 to 6 months after full production has been established. The purpose of this study is to review early operation of the equipment or change, to ensure that it is consistent with the design intent considering SHES hazards; and that assumptions defined in earlier hazard studies remain valid.

Following the identification of SHES hazards each of the hazard study and risk analysis tools requires the assessment of the likelihood and consequence of each event and assigns a risk ranking. This is undertaken in accordance with Orica's HIRAC Risk Matrix, which is embedded in the SHE Risk Register, which is where the outcomes of each of the assessments is documented.

8.2.2 MAJOR HAZARD FACILITY SAFETY ASSESSMENT

The Kooragang Island site utilises safety assessments that have been developed using the hazard identification, risk assessment and control (HIRACs) methodology to meet the requirements of Chapter 9 of the NSW Work Health and Safety Regulation 2017 for Major Hazard Facilities, rather than the methodology described in the Group Standards and Group Procedures. The procedure 'Periodic Hazard Study 2 Process' (OEL [10984276](#)) describes the methodology for the development of the HIRACs and it is based on the Hazard Study 2 process described in Section 8.2.

8.3 TASK BASED HAZARD ASSESSMENTS

Other processes that are used to assess and control hazards at a site operational level include:

- **Job Hazard Analysis (JHA)**

A JHA is completed prior to carrying out all maintenance and project task for which no procedure exists. JHA is a process whereby the individual job steps of a task are assessed to determine the controls required to manage hazards of the job steps.

- **Major Hazard Management Stop Cards**

Major hazard management Stop Cards are used onsite to identify major hazards prior to starting a known task or during the task. It is aimed at ensuring that key controls are in place prior to commencing activities.

8.4 INFORMATION RECORDING, STORAGE, AND REPORTING

All hazards identified, together with the causes, consequences and frequencies, and hence risks assessed from the various hazard study processes carried out at the Kooragang Island site are recorded in the Kooragang Island SHE Risk Register, a Lotus Notes database. The SHE Risk Register database is a controlled document management system with protocols for adding, revising and authorising documents.

It also incorporates an action management system to track completion of actions arising from the Hazard Studies, with timeframes for appropriate close out of actions. The status of these actions is reviewed monthly by the Orica Kooragang Island Management Team.

8.5 OPERATIONAL READINESS REVIEW

Prior to the commencement of the commissioning of plant and equipment a review of operational readiness is undertaken. This may include the undertaking of Hazard Studies 4 and 5 as detailed in Section 8.2.1 above. Plant modification processes, as described in Section 12 will also be undertaken and as required, a maintenance operational readiness process will be undertaken.

Where relevant, the review will include an assessment of the consistency of testing frequencies applied in the Preliminary Hazard Analysis/Final Hazard Analysis with the finalised and installed design to ensure that they are consistent for all safety critical equipment and systems.

9 MAJOR INCIDENTS AND MAJOR HAZARDS

9.1 MAJOR HAZARD FACILITY

The Kooragang Island site is classified as a major hazard facility under the NSW Work Health and Safety Regulation 2017 as it manufactures and stores quantities of certain chemicals above threshold quantities. The site was issued with a major hazard facility licence in November 2015 and it has subsequently been renewed to ensure a current licence is in place.

To support the application for a major hazard facility licence the site identified the major incidents and any hazards that could cause such incidents. Safety assessments were undertaken that identified the nature and likelihood of each major incident, the potential magnitude and severity should a major incident occur, and the control measures implemented. This information is stored in the Kooragang Is SHE Risk Register in Lotus Notes.

The site is required to apply for a renewal of the licence every five years.

9.2 ORICA MAJOR HAZARD PROGRAM

Orica has in place a major hazards management (MHM) program to prevent fatalities. The MHM program is a standardised process that provides a means to verify that key controls are well designed, understood, in place and working at the front line.

The program involves verification of the site's compliance with the key controls for each of the relevant major hazards specified in Orica's SHES MS. To enable assessment of compliance, the key controls have been brought together into relevant major hazard groups for ease of verification. For example, the key controls for the prevention of decomposing ammonium nitrate are:

- AN solution pH
- AN steam supply temperature
- Segregation of incompatible materials from AN
- Segregation of combustible materials from AN
- AN reaction system instrumentation and trips
- AN pumping system trips
- Decontamination

The verification program is scheduled by the site to systematically verify all key controls in all applicable site areas, over an established time period based on risk.

10 EQUIPMENT INTEGRITY

Orica Kooragang Island has an effective and comprehensive reliability and integrity management system in place for all critical plant and equipment. The system includes the following:

- Risk based inspections of plant and equipment.
- Root cause analysis of failure mechanisms to minimise the potential for a recurrence of reliability issues.
- Utilisation of integrity risk assessment processes to guide the management of key equipment including pressure vessels and piping.

- Planning and scheduling of maintenance for both safety critical and general equipment in SAP.
- Monitoring and reporting on key performance indicators.
- Engineering standards.
- Engineering specifications documenting the requirements for new plant and equipment, including quality assurance on materials and manufacturing, inspection and test plans, third party inspections, document provision and signoff by key parties as required. Development of life cycle plans for maintenance of the new plant and equipment.
- Condition monitoring of key plant and equipment.

The minimum requirements for equipment integrity are detailed in the SHES MS Group Standards and Group Procedures. For example, Group Standard 32: Process Safety, includes the requirements for the management of pressure equipment. Group Standard 37: Asset Lifecycle Management sets out the minimum requirements to optimise asset value (including safety) over the asset lifecycle.

Site specific systems have been developed to ensure that the integrity of these systems is maintained and managed appropriately.

11 SAFE WORKING PRACTICES

11.1 PERMIT TO WORK

Orica has in place a comprehensive system for the management of all work undertaken at the site. The requirements are detailed in the following group standards and procedures.

Group Standard 30: SHES Management; includes the requirement for managing SHES operational risks and tasks through the implementation of safe systems of work.

Group Standard 31: Personal Safety; includes the requirements associated with decontamination, physical isolations, personnel falling from heights, confined space entry and electrical safety.

Group Standard 32: Process Safety; includes the requirements for operational readiness

Group Procedure: SHES Permit to Work; defines how work must be assessed, hazards identified, and controls managed to ensure risks associated with work on site are controlled.

Permits to Work are used to authorise performance of non-routine work (eg. maintenance activities), to document transfer of control of the affected parts of a facility and to describe agreed controls to apply to the work. The requirements of the Group Standards and Group Procedure apply to all facilities, including offices.

Permits to Work and other associated permits are only able to be issued by Authorised Persons, who are experienced personnel who are familiar both with the plant operations and the SHES Management System requirements for permitting and have completed the required training.

Permits to Work and other associated permits are only able to be received by an Authorised Receiver, who is responsible for ensuring compliance with all requirements of the Permit to Work and associated permits and JSERA. They are also responsible for communicating the Permit to Work requirements to all personnel involved in the work. Authorised Receivers have completed the required training.

11.2 ADDITIONAL WORK PRACTICES

Daily operational meetings (involving operations, technical, maintenance and projects personnel) are conducted by both the Ammonia and Nitrates Operations teams. At these meetings safety issues, current plant operation, maintenance activities, developing issues and project work is discussed.

In addition, there is a handover at the beginning of each shift to enable communication between the outgoing and incoming team on the status of the plants, any operational issues and maintenance or project activities that are underway.

12 MANAGEMENT OF CHANGE

12.1 MANAGEMENT OF CHANGE

The requirements for the Management of Change are detailed in Group Standard 30: SHES Management and Group Procedure: SHES Management of Change, which defines the requirements to identify and manage the potential safety, health, environmental, and physical security risks associated with permanent or temporary changes to;

- Operations
- Procedures
- Site standards
- Facilities
- Suppliers
- Organisational structure.

The modification process involves a review of the proposed modification by a range of plant personnel, which can include engineering and maintenance personnel, approval by the system Gatekeeper and recording of the modification details in Enablon Change module. The review includes consideration of the hazards and controls to ensure that the risk has been eliminated or controlled to as low as reasonably practicable.

Where a significant SHE risk may exist, or the scale of the project is significant, then a full hazard study process may be undertaken to assess the modification (Section 8) as part of the management of change process.

Prior to implementation of any modification the changes are subjected to a SHE Acceptance Check to confirm that:

- The changes will be implemented in accordance with the change proposal;
- Specified risk assessments and design verification activities have been completed and all required actions have been implemented;
- Temporary change or repair proposals include the time period for which they are valid as part of their approval, and
- The changes will not introduce any unforeseen risks.

For temporary changes a temporary modification is completed. These temporary modifications have a validity period installed as appropriate in accordance with the risk to the process and the hazard. Temporary modifications are periodically reviewed to ensure the validity period is not exceeded.

All permanent and temporary plant modifications are managed and recorded in the Enablon Change module, with the status of modifications reviewed on a monthly basis by the Site Management Team, as part of the review of SHES KPI's. The Plant Modification Database in Lotus Notes was used prior to the commencement of Enablon, and some modifications are still being managed in this system. No new changes are being processed in the Lotus Notes database.

12.2 COMMUNICATION OF CHANGE

Operations personnel are advised of relevant modifications by shift reviewing processes, regular shift handover procedures including meeting with site operational management personnel, or changes to the operational training material, which is reviewed and carried out by relevant site personnel.

12.3 CHANGE SYSTEM ACCESS

A modification can be proposed by any person with appropriate skills and training. These personnel are approved to access the Enablon Change module after completion of an Orica online training course and subsequent approval by the management of change Gatekeeper.

13 INCIDENT AND NEAR MISS REPORTING

13.1 INCIDENT REPORTING AND INVESTIGATION

The reporting and investigation of incidents is managed in accordance with the requirements of Group Standard 30: SHES Management and Group Procedure: SHES Event Management. The Group Standard and Procedure addresses the requirements for immediate action, classification, investigation and reporting of SHES Incidents.

All incidents are recorded in the electronic Enablon data management and reporting system. The Enablon system requires identification of impacts, assessment of the severity of the incident, assignment of an Investigation Manager, investigation of the incident (if required) and tracking of actions to address the incident.

An incident is categorised according to the impact(s), which are detailed below:

- Injury/Illness
- Property Damage, Loss or Failure
- Environmental
- Non-compliance or Breach of Licence
- Community
- Reputation
- Business interruption; and
- Product security

There can be more than one impact for an event. The severity of the impact is determined during the incident investigation process.

A number of personnel onsite have undertaken Root Cause Analysis training which can be used in the investigation of significant incidents.

Serious incidents are also reportable to the Group Executive and President AusPac and the Vice President – Continuous Manufacturing. Reporting may also be required to Orica's Executive Committee. Reporting requirements are detailed in the procedure Incident Management, Notification and Investigation (OEL [1974988](#)).

Serious incidents may also require reporting to regulatory authorities such as SafeWork NSW, NSW Environment Protection Authority, Fire and Rescue NSW, Newcastle City Council and NSW Department of Health. There are site specific procedures that document the reporting requirements in the event of safety or environmental incidents. These are available in the [Emergency Stakeholder Notification](#) section of the Emergency Plan.

Incidents are communicated to the site through routine safety meetings that all personnel are required to attend. The Occupational Safety, Health and Environment Committee also reviews incidents on a monthly basis. All personnel are able to review incidents from the Kooragang Island site through Enablon.

The status of Kooragang Island incidents in Enablon is tracked on a weekly basis by the Site Management Team. The number of incidents recorded monthly is also captured and trended.

Actions identified in incident investigations are raised in Enablon. This database includes automatic notification for personnel that they have been assigned an action, as well as automatic reminders when actions become due. The status of actions is reviewed on a monthly basis, with a target of no overdue actions at the end of each month.

Significant incidents are reviewed by the Expert Panels to determine whether any changes to the Basis of Safety are required.

14 CONSULTATION AND COMMUNICATION

The site has a number of means by which workers are informed about SHES matters, which are described below.

14.1 OSHE COMMITTEE

The site has an Occupational Safety, Health and Environment Committee whose members are drawn from the different departments onsite, contractor representatives and the SHES team. The committee meets on a monthly basis and undertakes an inspection of a nominated area of the site and a meeting to discuss SHES related matters.

The aims of the committee are to consider, review and make recommendations in relation to all matters associated with workplace health, safety and the environment. This includes the development, implementation and review of procedures and consideration of changes to the site operations and systems.

14.2 MONTHLY SAFETY MEETINGS

All workgroups on site are required to participate in a monthly safety meeting, which is prepared by the SHES Team and delivered by the work team. The meeting provides information on incidents at the site, SHES awareness topics and SHES performance.

14.3 INTERNAL NEWSLETTER

The site has a fortnightly internal newsletter that shares information on activities across the site. SHES information is included in the newsletter from time-to-time.

14.4 SITE “TOWNHALL” MEETINGS

Periodic meetings are held by the Manufacturing Centre Manager to communicate with workers at the site. Information on SHES performance and activities is shared in this meeting.

15 TRAINING AND COMPETENCY

Group Standard 30: SHES Management defines the requirements for the management of SHES training and competency. This includes:

- Definition of roles with SHES specific responsibilities and authorities, including the qualifications required;
- Pre-employment and ongoing assessment of the qualifications and abilities of employees to meet job requirements; and
- Initial, ongoing and periodic refresher training to mitigate potential SHES hazards.

A four tier training system is used for operational personnel, as outlined below:

- Tier 1 – initial training required upon commencing employment. This includes the site and plant area induction.
- Tier 2 – functional specific training which is completed within the first month of employment and includes safety related training such as on the relevant basis of safety.
- Tier 3 – role specific training, which includes the detailed technical training required for the operation of the plant.
- Tier 4 – leadership training for team leaders.

15.1 RECRUITMENT

Orica seeks to ensure that personnel within our operations are committed to ensuring a high standard of SHES performance and technical competency through the use of a formal recruitment process. This process includes the use of targeted selection, which includes assessment of SHES commitment and reference checking to confirm technical competency.

15.2 GENERAL SITE INDUCTION

All employees and contractors undertaking work at the site complete the General Site Induction. The induction includes an introduction to the operations at the site and the associated hazards. The SHES Management Systems which are used at the site to control these hazards are also introduced to personnel.

The requirements for an induction are detailed in the site-specific procedure [Site Inductions](#). Orica Kooragang Island site employees are required to be re-inducted every 3 years, whilst contractors are required to be inducted on a yearly basis.

The induction includes an assessment of the competency of the inductee, with personnel required to successfully complete a questionnaire.

There is a specific Truck Driver Induction for all personnel who are responsible for transporting product from the site.

Visitors undertake a brief induction prior to entering the site and are escorted at all times whilst onsite.

Project specific induction are held when key projects or maintenance activities are undertaken. This enables key SHES information to be communicated to the relevant work group. For example, turnaround inductions are held for workers prior to major maintenance outages.

15.3 TRAINING REQUIREMENTS

Central to Orica's SHES strategy is that appropriate training is in place to equip all personnel to carry out their tasks so as to take care of themselves, others and the environment. The training needs of all personnel onsite are documented in training matrices or career progression skills manuals. These include both SHES and technical training requirements. The training needs are reviewed periodically through a training needs analysis process and the updated matrices reviewed with the Occupational Safety, Health and Environment Committee.

These include

- Basis of Safety, where the hazards and management requirements for ammonia, nitric acid and ammonium nitrate are reviewed;
- SHES Management System awareness;
- Emergency response and emergency systems training;
- Root cause analysis;
- Behavioural Safety Program;
- Plant inductions;
- Specialist training; and
- External training.

15.3.1 PROCESS OPERATOR TRAINING

Process operators undertake training in accordance with career progression manuals and training matrices.

Training modules include the assessment of competency both through classroom and field assessment.

Updates to plant operating procedures are electronically sent to all relevant personnel using the OEL. Procedures are updated following plant modifications or as a result of actions from incident investigations.

15.4 TRAINING RECORDS

Training records are retained electronically in the site's training records management system, SuccessFactors – Learning Management System. This system includes reminders where the competency is expiring. Contractor training records are maintained in the Onsite Track Easy system.

15.5 CONTRACTOR /SUB CONTRACTOR SELECTION AND CONTROL

Orica's requirements for work performed by Contractors and Sub-Contractors on the Kooragang Island site is detailed in Group Standard 30: SHE.

The Kooragang Island site has an accreditation process for contracted service providers working at the site. This includes the completion of an application to enable assessment of their suitability to undertake work at the site. This assessment includes the provision of information on the commercial operations of the business, stability of the business, quality systems, training and

compliance, security management and SHES systems and performance. Without accreditation of the company, and continuing maintenance of this accreditation, the company is not able to work onsite.

If a primary contractor engages a subcontractor then they are responsible for the works and the management of the subcontractor. The subcontractor is required to be registered on Orica's contractor management system prior to commencing work onsite.

All contractors onsite undertake the standard site induction and any relevant plant or specialist inductions.

Regular meetings are held with the key onsite contractor companies, at which SHE issues are discussed.

Contractors who are onsite in a full-time support role are included in Orica SHES initiatives.

16 EMERGENCY PLANNING AND RESPONSE

A comprehensive Emergency Plan is in operation at the site to mitigate the consequences and assist in managing an emergency situation which may develop at the site.

The plan includes information on the procedures to be implemented to prepare for, respond to and recover from an emergency at the site. It also includes details on the roles of response personnel, general site personnel, the training undertaken to prepare personnel to respond to an emergency, emergency exercises and the resources and equipment for use during the incident.

The Emergency Plan includes details on how the site is notified of an emergency and the communication channels available during the emergency.

Details for the notification of emergency services, agencies, adjacent neighbours and other stakeholders in the event of an emergency are also included within the plan.

The Emergency Plan includes details on how personnel onsite are accounted for in the event of an emergency, with the electronic access system used to account for personnel initially. Additional responses are available to locate personnel in the event that they are not able to access the electronic access system.

Investigation of the emergency incident will be undertaken in accordance with Orica's Group Procedure: SHES Event Management. Where required, reports detailing the outcomes of the investigation will be provided to the relevant authorities in the required timeframe.

The Emergency Plan is kept in key locations at the site, is available electronically and has been provided to Fire and Rescue NSW and SafeWork NSW.

17 SECURITY

Orica Kooragang Island has a Site Security Plan which details the management of security at the site. The plan includes the outcomes of the site security risk assessments and control measures that were identified to address potential risks.

The Site Security Plan includes:

- personnel and vehicle access arrangements, including supervised access points and electronic access systems.
- security site physical assets

- security arrangements associated with the manufacture and storage of security sensitive ammonium nitrate.
- security monitoring and assurance

Security of electronic information and documents is also managed. Both the site Local Area Network and the plant Distributed Control System including features to ensure only authorised personnel are able to access the system and that the systems are backed up on a regular basis. Key documents are retained in secure locations.

Breaches of security arrangements are reported through the Enablon system and external organisations as required.

18 PERFORMANCE MONITORING AND REPORTING

The SHES due diligence process is a vital part of internal benchmarking and compliance assurance for Orica. Verification and compliance of the various SHES MS components is conducted through an internal and external audit/inspection process. A schedule is created annually to document the internal audits/inspections of key requirements of the Group Standards and Group Procedures and for required corporate audits. The corporate audits provide an opportunity to capture best practice across the organisation.

Data is recorded monthly on numbers of audits/inspections completed and compliance to the schedule. Identified deficiencies are recorded, assessed and corrective actions implemented based on priority ensuring the requirements of the SHES MS are established and maintained.

18.1 CORPORATE SHES AUDITS

Corporate SHES Audits requirements are described in Group Standard 30: SHE Management and Group Procedure: SHES Assurance, including the requirements for planning, administration, reporting, corrective action and follow-up of Corporate SHES audits and reviews.

The Corporate SHES Auditors perform their auditing activities at the request of the Orica Limited Board of Directors. They utilise a number of audit types to gather the required data on both the effectiveness of sites SHES Management Systems, their compliance with the SHES Management System key requirements and potential environmental legacy issues.

Sites are selected for audits using a risk-based prioritisation system, published as an annual auditing plan being representative of Orica's risk profile.

The findings of these audits are initially reported to the site teams, Group SHES team and Executive Committee. They are then logged in Enablon, along with actions to correct identified issues or opportunities for improvement.

18.2 INTERNAL SHES AUDITS/INSPECTIONS

The site audits/inspections assessing compliance with group standards and group procedures are conducted on an annual basis. The Kooragang Island SHES Manager is responsible for the development of a schedule which details the auditor and due date. Progress against the schedule is routinely tracked at the Site Management Team meetings with appropriate follow up.

Auditors are selected from the site management and operational teams according to their experience.

The audit outcome and references to any improvement actions raised to address non-conformances are assigned an owner and entered into Enablon.

19 SAFETY MANAGEMENT SYSTEM REVIEW

Group Standard 01: Controlled Documents and Records Retention defines the minimum review frequency of policies, group standards and group procedures. These documents require review at least every three years.

This Safety Management System document is reviewed at least every two years, or when there are significant changes in the SHES MS or organisational structure. The Senior Safety Specialist is responsible for coordinating this review.

20 REFERENCES

Document	Source organisation
<u>Hazardous Industry Planning Advisory Paper No. 9 – Safety Management (2011)</u>	Department of Planning

21 APPENDIX 1 – SAFETY, HEALTH, ENVIRONMENT AND SECURITY POLICY



POLICY | AUGUST 2020

SAFETY, HEALTH, ENVIRONMENT AND SECURITY

Together, we are committed to managing our operations and associated activities in a safe, secure and sustainable manner. We care for the environment as well as the health and safety of our people, customers and our communities.

Safety, Health, Environment and Security (**SHES**) are essential to our business success and are foundational to Our Charter. Personal ownership through visible and felt leadership and individual responsibility at all levels is essential to our success.

OUR SAFETY, HEALTH, ENVIRONMENT AND SECURITY COMMITMENT

- We drive behaviours which demonstrate a strong commitment to SHES and we empower our people to stop unsafe work when key controls are not in place.
- We always promote and protect our people's health and wellbeing and manage fitness for work.
- We minimise adverse impacts of our operations on the environment and effectively engage with our local communities.
- We protect our people and secure our products, assets and workplaces.
- We develop, maintain, implement and review a robust SHES management system.
- We communicate, consult, and actively engage with our people in the identification, assessment, control and verification of risks, leveraging the hierarchy of controls.
- We comply with all relevant SHES legislation and implement a robust assurance framework to monitor ongoing compliance.
- We provide relevant training, instruction and supervision to all who carry out work in our business.
- We report, investigate, analyse, and take action to prevent reoccurrence of SHES events.
- We maintain SHES metrics, analyse and report on performance to support timely and proactive business decisions.
- We are committed to continuously improving our SHES performance through monitoring, reviewing and reporting and develop objectives, targets and programs to drive improvements.
- We create and maximise opportunities to learn and share SHES knowledge within Orica, the community and industry.

We do all this, because we care and at Orica these are the core fundamentals to our organisation and our people.

Approved by
Orica Limited Board
August 2020

Owner: Managing Director & CEO
Approved: 31 August 2020 - 05:57 GMT
Approved By: Erin O'Connor

Public

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Next Review: 28 August 2023
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