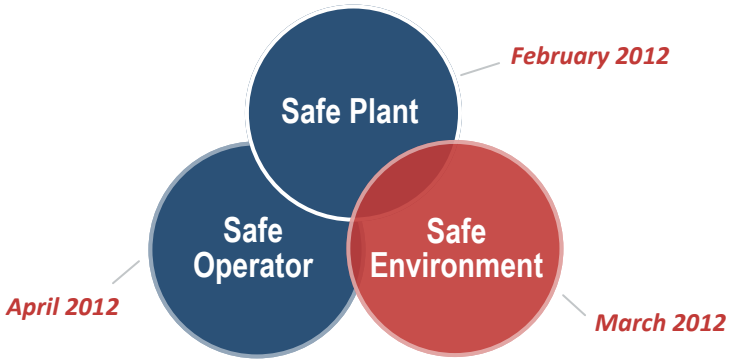
PLANT SAFETY MANAGEMENT MODEL

SAFE ENVIRONMENT

The Plant Safety Management Model identifies three key elements of a plant safety management system.

This article focuses on the **SAFE ENVIRONMENT** element of the Plant Safety Management Model when used on a construction project.



SAFE PLANT

Ensure plant is safe for use

- ✓ **Focus Area 1:** Detailed plant hazard assessment review against:
  - OH&S legislation
  - Australian and International Standards
  - Leading industry practice
- ✓ **Focus Area 2:** Daily inspection and fault rectification process
- ✓ **Focus Area 3:** Proactive and robust maintenance regime
- ✓ **Focus Area 4:** Standard Safe Operating Procedure (SOP)

SAFE ENVIRONMENT

Ensure site and task hazards are identified, assessed and controlled

- ✓ **Focus Area 1:** Site review
- ✓ **Focus Area 2:** Project task review
- ✓ **Focus Area 3:** Prepare the WHS Management Plan
- ✓ **Focus Area 4:** Implementing high impact elements of WHS Management Plan

SAFE OPERATOR

COMING SOON

Ensure the operator is competent to operate the plant and perform the task required

- ✓ Plant knowledge and plant operation, understanding of SOP
- ✓ General hazard awareness and safety system knowledge
- ✓ Understanding of site requirements, hazards and controls
- ✓ Understanding of task requirements, hazards and controls

Ensuring a Safe Environment encompasses identifying and managing SITE and TASK related hazards for any project.

Anyone who has been around construction projects for a while knows that there are many views on how this should be done, and many differing approaches to this responsibility.

It is fair to say that the lack of consistency to managing site and task safety creates a lot of unnecessary work for project principals, contractors and subcontractors.

This is not good, however what is worse is that the multitude of approaches also confuses operators, leading to apathy relating to site and task safety.

The objective of the Plant Safety Management Model is to clarify and simplify the process of identifying and managing hazards, including reducing the amount of paperwork produced.

Delivering a Safe Environment involves managing site and task hazards, and is divided up into the following **FOCUS AREAS**:

FOCUS AREA

1. Site Review
2. Project Task Review
3. Prepare the WHS Management Plan
4. Implementing High Impact Elements of WHS Management Plan

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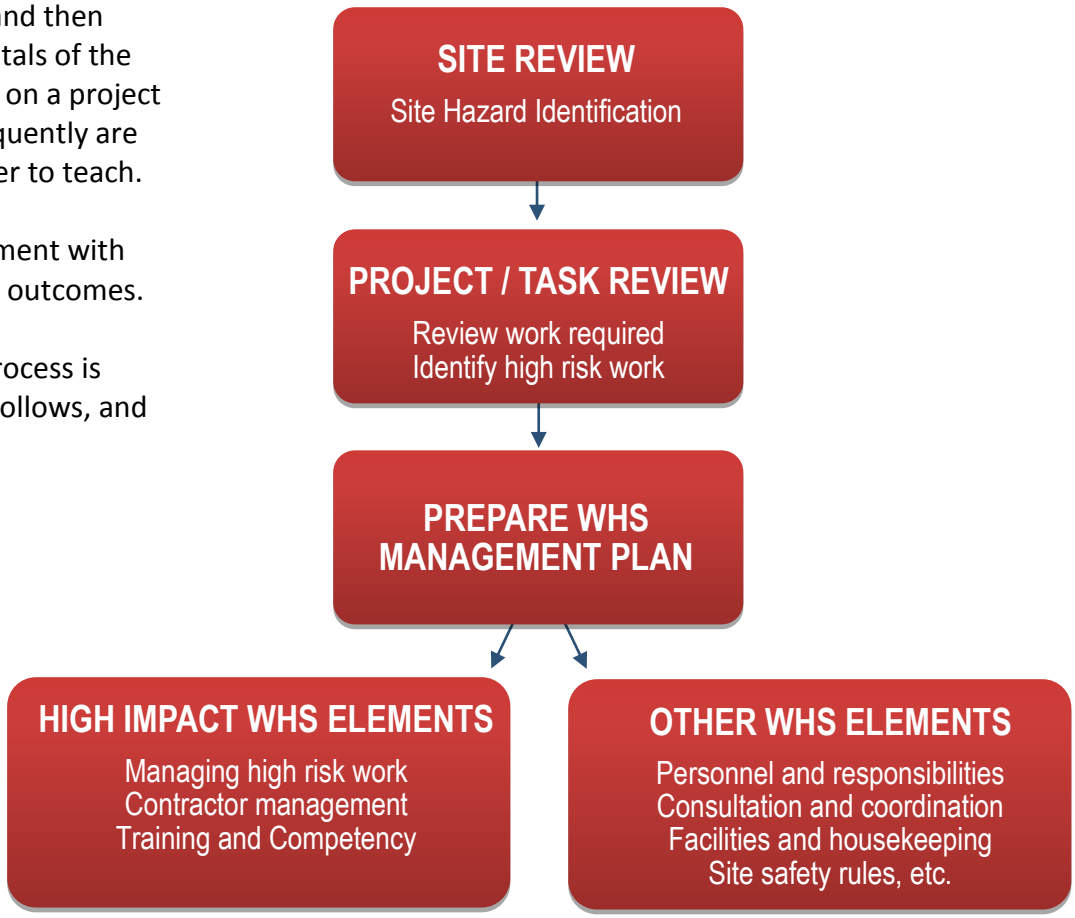
By splitting these areas up and then linking them, the fundamentals of the safety management system on a project become clearer, and consequently are better understood and easier to teach.

This leads to better engagement with personnel and better safety outcomes.

The SAFE ENVIRONMENT process is graphically represented as follows, and explained below:



Focus Area 1 Site Review: Hazard Identification, Risk Assessment and Control

The review of site attributes is the logical first step in ensuring SAFE ENVIRONMENT for the project.

This should be undertaken using a traditional hazard identification, risk assessment and control process, which generates information which is then used in planning the management of task hazards.

Site inspection includes consideration of such issues as:

SITE ATTRIBUTES	DETAILS
Access and egress to site	Vehicle and pedestrian traffic, parking, employee pedestrian access etc.
Geographic conditions	Slope, rivers/creeks etc.
Geological conditions	Unstable ground conditions, undermining, sinkholes etc.
Weather conditions	Extreme heat, cold, wind, rain, snow or ice and seasonal factors etc.
Neighbouring operations	That may create hazards on site such as fume, toxic substances, noise, explosion, cave in, deluge etc.
Size of site	Relative to project footprint – crowding, deliveries, storage
Location of site	Travel fatigue issues, work in combat zone or politically unstable country or province, possible terrorism etc.
Other attributes	That may represent a hazard during or after construction works

The site inspection results in:

- Elimination of some hazards
- Identification of some site wide controls required
- Referral of hazard information to Step 2 - Project Task Review

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Focus Area 2 Project Task Review

Armed with the information generated in Focus Area 1, Focus Area 2 involves taking a "helicopter view" of the project and reviewing the nature of the work to be undertaken.

It is important to take a risk management approach when undertaking this review and to map out the areas of work which are likely to involve HIGH RISK WORK. See Table 1 for common high risk work areas.

Table 1: Common High Risk Work Areas*

Falls and falling objects
Traffic management
Essential services
Hazardous manual tasks
Hazardous chemicals
Asbestos
Confined spaces
Access and security
Electricity
Mobile and Other Plant
Noise
Steel construction

* Safe Work Australia Draft Construction Code of Practice 2012

Completion of Focus Area 2 results in the clear identification of the type of high risk tasks that will or may be undertaken as part of the project.

Armed with this information, the WHS Management Plan can be prepared.

Focus Area 3 Prepare the WHS Management Plan

This plan documents the approach to managing safety on a project.

Tables 2 and 3 below show key elements of a WHS Management Plan, divided into HIGH IMPACT and OTHER elements.

All elements of the plan are important, however HIGH IMPACT ELEMENTS require much more active management to develop and deliver.

If high impact elements are not approached diligently, safety on the project will almost certainly be sub-standard in the areas that deliver the most critical systems and safeguards.

Table 2: High Impact Elements of a WHS Management Plan

A	Managing High Risk Work
B	Contractor Management
C	Induction and Training Requirements

Table 3: Other Elements of a WHS Management Plan

Key personnel and responsibilities
Consultation, cooperation and coordination arrangements
Provision of facilities and housekeeping
Specific site safety rules. These should include, but not be limited to: • Housekeeping • Traffic management • Incident reporting & management • First aid & emergency response • Alcohol & drugs • Plant & Equipment – site rules • PPE • High risk work—management principles

Focus Area 4 will focus on implementing the high impact elements in Table 2.

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Focus Area 4-A Managing High Risk Work

This Focus Area revolves around the management of Safe Work Methods Statements (SWMS) which are mandatory for high risk construction work (Model WHS Regulation 299).

The Safe Work Australia Draft Code of Practice for Construction Work identifies that a SWMS must:

- *identify the work that is high risk construction work*
- *specify hazards relating to the high risk construction work and risks to health and safety associated with those hazards*
- *describe the measures to be implemented to control the risks*
- *describe how the control measures are to be implemented, monitored and reviewed.*

Readers who wish to view a SWMS template should download a copy of the draft **Code of Practice**, and refer to Appendix B (pages 47-51).

It is appropriate to consider some critical **'must dos'** when managing and preparing SWMS:

MUST DOs

1. **Have a plan or map of project areas requiring SWMS** and their interrelationships (refer Focus Area 2 above)
2. **Minimise the number of SWMS required** - combine multiple high risk tasks into one SWMS where practical, do not complete for non-high risk or non-unique tasks
3. **Use a consistent format and language**, avoiding jargon where possible
4. **SWMS should be facilitated and recorded by experienced personnel**, in consultation with people who are or shall be undertaking the task concerned
5. **Rigorously apply the hierarchy of controls**, to avoid over reliance on administrative controls to manage every hazard identified
6. **Ensure the induction process explains the site SWMS regime**
7. **Test knowledge of and compliance with SWMS in the workplace**

By following these "must dos", SWMS will deliver considerable safety benefits on any project.

Maximising the effectiveness of SWMS

Dr David Borys, a Senior Lecturer at the University of Ballarat released an excellent research paper in September 2011 regarding the role of SWMS in the Australian construction industry.

This study confirms the importance of SWMS in managing construction safety and highlights the importance of consultation in the SWMS development process.

Dr Borys's research paper includes his "Three Gaps Model" model, which is very useful for identifying and bridging gaps in the SWMS process.

This model is reproduced below:

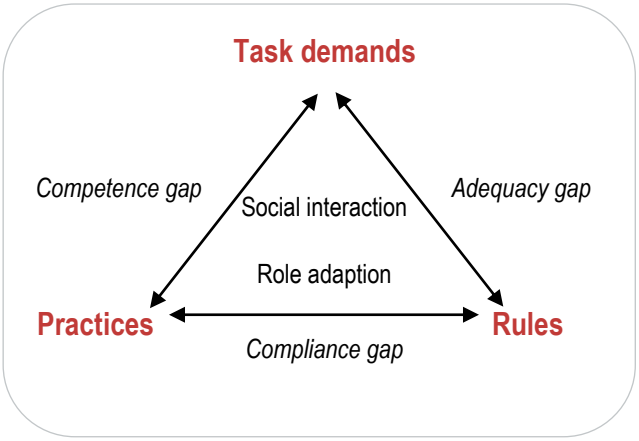

Figure 1: Borys's Three Gaps Model

- ✓ The **task demands** reflect what needs to be achieved
- ✓ The **rules** are the processes embodied within the SWMS
- ✓ The **practices** are the behaviours of personnel in conducting the task

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The gaps and how to minimise them:

GAP	HOW TO MINIMISE THE GAP
The **adequacy gap** reflects the gap between how the SWMS says the task *should be* carried out and how the task will practically *need to be* carried out (ie. SWMS does not recognise practicalities of doing the job)	Ensure development of the SWMS is facilitated by an experienced supervisor or equivalent Develop in consultation with personnel who are or shall be involved with undertaking the task
The **compliance gap** reflects the gap between what has been agreed as the task process in the SWMS and how the task is being carried out (ie. SWMS correct but personnel incompetent to follow it)	Ensure all personnel are aware of the existence, importance and content of SWMS Conduct periodic observation audits against SWMS Good old fashioned supervision is crucial in maintaining the right work environment where knowledge of and adherence to proper procedure is respected
The **competence gap** reflects the gap between what is required to do the task in accordance with the SWMS, and the knowledge and capabilities of individual personnel	Ensure training and induction processes are followed (see 4C below)

High risk work is therefore managed as follows:

1. Develop a clear idea of where, when and what high risk work is to be undertaken on a project
2. Implement a robust system of developing and collecting SWMS
3. Utilise the Three Gaps Model to test the effectiveness of the SWMS process, utilising observation audits of actual tasks being undertaken and comparing this to SWMS contents

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Focus Area 4-B Contractor Management

Contractor management is arguably the most difficult element of any construction project to manage due to the large number of external parties often involved.

Contractor Pre-Qualification

Pre-qualification involves contractors submitting information on their safe systems of work to a principal contractor, and being subject to an audit.

Pre-qualification is suitable for principals and contractors who work on multiple projects together. It can be a time consuming and costly exercise, however saves a great deal of time when tendering for and undertaking multiple projects.

Anyone employing contractors/subcontractors on site must ensure the contractors they employ have a safe system of work covering the activities they are undertaking.

For contractors using plant, this safe system of work needs to recognise the specific site and project requirements, and illustrate management of:

1. Safe Plant – refer previous article on Safe Plant:
a. Plant hazard assessments
b. Pre-op checks and maintenance regime
c. Machine safe operating procedures

2. Safe Environment
a. Recognition and compliance with site safety rules
b. Site and job hazards identified & managed
c. SWMS developed where required and followed

3. Safe Operator – article to come April 2012
a. General construction induction
b. Site induction
c. Plant operation licences where required
d. High risk work licences where required
e. Operator competency assessment regime in place - transparent and auditable

Capturing this data in a practical and manageable way is one of the great challenges of construction project management today. As a result of this, various contractor management systems have been developed, particularly utilising “cloud” based systems that contractors can upload information into.

We recommend consideration of online contractor management systems to simplify the exchange and management of data on project safety management.

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Focus Area 4-C Induction and Training Requirements

Training and competency assessment are critical to the extent that a project safety management system relies upon competency, know how, and administrative controls (such as Site Safety Rules and SWMS) to manage safety risks.

It is wise to follow the KISS principle when approaching this task. As a minimum, the following information should be accessible for every person working on a site:

ALL PERSONNEL	PERSONNEL CONDUCTING HIGH RISK WORK
General construction induction	Knowledge of relevant SWMS
Site induction and knowledge of site safety rules	High risk work licence where required
Trade qualifications & general task competency	Operator competency for plant

It is important for employers to maintain auditable records of the training and competencies required for each of their employees working on or around a project.

When employing contractors, contracts should require:

1. Positive confirmation from the relevant contractor that their staff possess the relevant licences and competencies to undertake the relevant work
2. The contractor has auditable records proving that these licences and competencies are current

In addition to this, it is preferable to also systematically audit contractors' records on a random basis, with a focus on personnel conducting high risk tasks.

This topic will be the subject of the next edition of the Plant Safety Management Model Series.

Our Safe Operator article in April 2012 will consider how to simply and effectively manage the complex area of ensuring Safe Operators are at work on your project.

SUMMARY – SAFE ENVIRONMENT

Whilst this can be a highly complex area, by following the process set out above the safe environment element of the safety management system can be achieved.

By integrating the Safe Environment element with the other key elements of the Plant Safety Management Model, the overall safety system for a construction process will be both robust and practical.

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