
ENGINEERED GEOTHERMAL SYSTEMS (EGS) ENERGY LIMITED

Safety Management System Implementation Plan (Gap Analysis)

Based on the requirements of

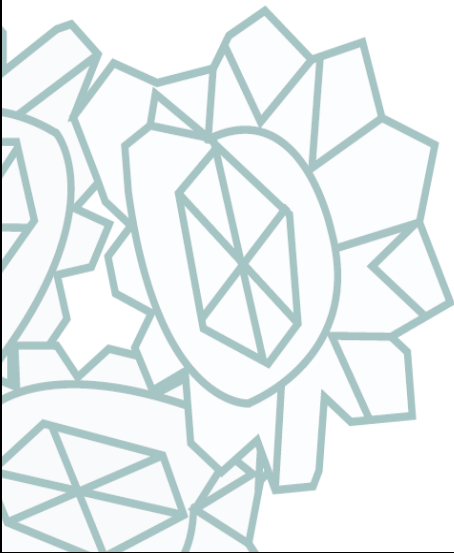
BS OHSAS 18001: 2007.

Borehole Sites & Operations Regulations 1995.

Offshore Installations and Wells (Design &
Construction, etc) Regulations 1996.

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Safety Management System Implementation Plan

Introduction

The purpose of this document is to assess the safety management system (SMS) of Engineered Geothermal Systems (EGS) Energy Limited, against the requirements of the BS OHSAS 18000 series of standards, the Borehole Sites and Operations Regulations (BSOR) 1995 and the Offshore Installations and Wells (Design and Construction etc) Regulations (DCR) 1996. The document will identify weaknesses or omissions and develop a plan to achieve full implementation of the SMS and compliance with statutory legislation.

The SMS is intended to effectively manage the Occupational Health and Safety (OH&S) of employees and other interested parties.

The BS OHSAS 18000 series is:

- BS OHSAS 18001:2007 Occupational health and safety management systems requirements;
- BS OHSAS 18002:2008 Guidelines for the implementation of BS OHSAS 18001:2007; and
- BS OHSAS 18004:2008 Guide to achieving occupational health & safety performance.

This document will set out the recommended actions for implementing BS OHSAS 18001:2007 which are laid down in BS OHSAS 18002:2008, and the recommended actions required in order to demonstrate compliance with BSOR and DCR. The document will assess how these actions have been, or are to be, met within EGS Energy Limited and will conclude by suggesting action needed to ensure that the system is implemented efficiently and on time.

SMS Requirements from BS OHSAS 18001

Table 1 (page 5) shows the OHSAS 18001 requirements as headings in bold with the OHSAS 18002 guidelines to achieve each requirement detailed below. The EGS Energy Limited actions taken or planned are shown against each guideline with an estimation of the progress as of the 13th March 2013. This forms an effective gap analysis which will identify areas for remediation.

Identified Gaps in BS OHSAS 18001 Requirements

Table 2 (page 23) shows the items identified for further action.

SMS Requirements from the Borehole Sites & Operations Regulations (BSOR) 1995

Table 3 (page 34) shows the BSOR requirements as headings in bold with the Regulations and Guidance to achieve each requirement of the legislation. The EGS Energy Limited actions taken or planned shall be inserted against each Regulation and Guidance as and when received, in order to demonstrate compliance.

SMS Requirements from the Offshore Installations and Wells (Design and Construction etc) Regulations (DCR) 1996

Table 4 (page 47) shows the DCR requirements as headings in bold with the Regulations and Guidance to achieve each requirement of the legislation. The EGS Energy Limited actions taken or planned shall be inserted against each Regulation and Guidance as and when received, in order to demonstrate compliance.

Forward Plans

The forward plans below, shows a list of remedial actions needed to bridge the gaps found, and achieve the requirements of OHSAS 18001, BSOR and DCR.

Forward Plan - OHSAS 18001

- 1) Insert the health and safety policy statement from the Subcontractors Manual into the IMS Manual.
- 2) Reference health & safety model; OHSAS 18001: 2008, and health and safety, in conjunction with quality and environment throughout your documentation, for example, health, safety, environment and quality (HSEQ).
- 3) Check that all applicable OH&S legislation, codes of practice and guidance documents have been included in the current IMS Doc. No. 5 - Register of Regulations.
- 4) Draft an additional Management procedure (MP) for the Identification of Health & Safety Risks.
- 5) Draft an additional MP for Incident Reporting and Investigation.
- 6) Draft a quantitative risk assessment form that allows the user to identify the hazards, the hazard effect, control measures to eliminate or reduce the risks and preliminary and residual risk ratings based on a 5 x 5 matrix.
- 7) Draft a 5 x 5 risk matrix based on likelihood x severity and formulate a risk rating table based on acceptable and unacceptable levels of risk.
- 8) Draft a COSHH risk assessment form.
- 9) Draft a COSHH register.

- 10) Draft a Provision & Use of Work Equipment Regulations (PUWER) risk assessment form.
- 11) Draft a Management of Change procedure.
- 12) Draft and maintain an Incident Register.
- 13) Draft a permit to Work procedure.
- 14) Refine existing Contractor selection/control management procedure (MP).

Forward Plan – Borehole Sites and Operations Regulations 1995

- 1) Notify the HSE of the project.
- 2) Exercise overall control of the site and recognise statutory duties as the owner/operator. Roles and responsibilities will be defined within the EGS SMS, which will form the basis to meet the requirements of BSOR.
- 3) Ensure co-operation between employers and self-employed persons throughout the project. Develop site rules and inductions for EGS operations to be distributed to all personnel and identify specialist training requirements for particular roles.
- 4) Ensure all relevant information, for example, risk assessments, technical drawings and files etc are provided.
- 5) Compile the health and safety document. This will be developed closer to the commencement of operations and will be based on the Operators SMS, and a Bridging Document with the Main Contractor (drilling contractor) including Emergency Response procedures.
- 6) Assess the requirement of additional duties of the operator. To meet the requirements of Regulation 8, a construction MP will be drafted which will require the compilation of an “As Built Document” on completion of construction, thereby confirming the site specifications and suitability. Draft a wellsite handover certificate for construction.
- 7) Assess the need for additional health and safety requirements. Draft Pre-Task Risk Assessment MP and documents to ensure that any additional operations not covered in the pre operation RA are assessed. Identify requirements for signage, zoning, traffic etc. Review requirements for specialist services i.e. EX Zoning, NORMS etc.
- 8) Consider health surveillance. This will be addressed within the EGS SMS, but an operational Risk Assessment will be completed and reviewed prior to operations.
- 9) Provide HSE with 21 day notification prior to commencement of drilling operations, with the submission of the drilling program. Schedule 1 specifies what must be covered in this submission.

Forward Plan – Offshore Installation and Wells (Design and Construction etc) Regulations 1996

- 1) Ensure that the general duties of the operator for the safe condition of the well at all stages of its life are recognised and implemented. This will take the form of a Well Operations Standards document (essentially policies and procedures).
- 2) Conduct an assessment of the conditions below ground at the pre-design stage and post-design stage. This will be completed through an EGS led geological assessment and drilling review (first stage risk assessment).
- 3) Ensure that the well is designed to enable suspension or abandonment as and when required (UK Oil and Gas guidelines to be followed). This will be within the Moorhouse design review.
- 4) Ensure that every part of the well is composed of materials that are suitable for purpose. This will be within the Moorhouse design review.
- 5) Ensure that suitable well control equipment is provided for use. This will be within the Moorhouse design review.
- 6) Draft a written scheme for independent well examination. UK Oil and Gas guidelines to be followed.
- 7) Report the operational state of the well to the HSE on a regular basis. Draft a weekly HSE report template.

Table 1

No.	OHSAS 18002 guidelines require:	Effected in EGS Energy Limited by:	%
1	Define and document the scope of the SMS		
1.1	Initial review to determine current position.	Moorhouse Petroleum Limited	100%
1.2	Setting the scope of the SMS.	Integrated Management System (IMS) Manual – Section 4.0 Scope & Field of Application and Section 6.0 Introduction to the Integrated Management System.	80%
2	Top management define and authorise policy within SMS scope		
2.1	Record high level risk assessment to	(Currently Environment & Quality only)	0%

No.	OHSAS 18002 guidelines require:	Effected in EGS Energy Limited by:	%
	define depth/detail required.		
2.2	Establish core values and a vision for the future of the organisation.	IMS Manual – Section 1.0 Management Policy.	100%
2.3	Develop a policy statement (also satisfying HASWA 1974) which commits, as a minimum, to: <ul style="list-style-type: none"> • Prevention of ill health and injury; • Continual improvement in OH&S management; • Continual improvement in OH&S performance; • Compliance with applicable legal requirements; and • Compliance with other requirements to which the company subscribes. 	Subcontractors Manual – Health & Safety Policy.	90%
2.4	Develop a full OH&S policy document (see Page 12, OHSAS 18002).	Subcontractors Manual – Health & Safety Policy.	90%
2.5	Communicate the policy to all interested parties (decide on paper copies, website, intranet).	On Company server and paper copy.	100%
2.6	Periodically review the policy and communicate changes to all persons working under the control of the organisation.	Policy signed and dated. Statement made within the policy to review the policy on an on-going basis.	100%
3	The organisation shall establish, implement and maintain a procedure(s) for ongoing hazard identification, risk assessment and determination of necessary controls		
3.1	Develop a methodology for hazard identification (HAZID) and suitable and sufficient risk assessment (RA).	Health and Safety Policy Statement. (Currently Environment & Quality only)	50%
3.2	Identify all hazards.	(Currently Environment & Quality only)	50%
3.3	Assess the risk from those hazards, taking into account the adequacy of existing controls.	(Currently Environment & Quality only)	50%
3.4	Apply risk controls to reduce risk ALARP using an appropriate hierarchy.	Hierarchy of risk controls were not found within the documents submitted.	0%
3.5	Implement controls.	IMS Manual (Currently Environment & Quality only) Health and Safety Policy Statement	70%
3.6	Manage change as a result of implemented controls, including information instruction and training.	Health and Safety Policy Statement	70%
3.7	Record and document HAZID and RA results.	Document & Data Control (Currently Environment & Quality only)	70%

3.8	Review the RA documents on: <ul style="list-style-type: none"> • Periodic risk based frequency; • Technology change; • Legislation change; • Work method change; • Substance change; • Introduction of vulnerable person; and • After an incident. 	(Currently Environment & Quality only)	70%
3.9	Carry out internal audits to check that the methodology is functioning.	Internal Audit Schedule. EGSIARec - Internal Audit Record Form. EGSIARep – Internal Audit Report Form. (Currently Environment & Quality only)	70%
4			
Establish, implement and maintain a procedure(s) for identifying and assessing legal and other OH&S requirements that are applicable to it			
4.1	Establish a statute, legislation and codes of practice register with a procedure for use and nominated persons authorised to receive the information.	MP 17 – The Register of Regulations.	90%
4.2	Nominate competent persons within each technical specialism to update the register for new/revised legislation in their area.	IMS Manual – Section 11.0 The Management Representative.	100%
4.3	Communicate the contents of the register to nominated staff and interested parties and in particular to those responsible for risk assessment.	On Company server and paper copy.	100%
5			
Establish, implement and maintain documented OH&S objectives, at relevant functions and levels within the organisation			

5.1	Using legal requirements, prioritised list of risk assessments, employee feedback, management review, incident records etc. set objectives which are: Specific; Measurable; Achievable; Realistic; and Time limited.	IMS Manual – Section 9.2 and 9.4 IMS Doc. No. 4 MP 13 – Objectives & Targets. (Currently Environment & Quality only)	90%
5.2	Establish a programme for achieving those objectives including: <ul style="list-style-type: none"> • Designation of responsibility and authority; • The means by which the objective is to be achieved; • The time-frame in which the objective is to be achieved; and • Success criteria for establishing when the objective is met. 	IMS Manual – Section 9.2 and 9.4 IMS Doc. No. 4 MP 13 – Objectives & Targets. (Currently Environment & Quality only)	90%
5.3	Communicate the programme to relevant personnel.	On Company server and paper copy.	100%
6	Top management shall ensure the availability of resources essential to establish, implement and maintain the SMS		
6.1	Determine the resources needed to prevent injuries and ill health in the workplace using expert advice where required.	Management Review – IMS Manual Section 27. Management Review Agenda and Minutes Form.	100%
6.2	Ensure that expertise and training are included as resources.	Management Review Agenda and Minutes Form.	100%
6.3	Ensure that the resources identified are supplied in a timely manner.	Management Review Agenda and Minutes Form. Objectives and Targets Programme. EGSIARec - Internal Audit Record Form. EGSIARep – Internal Audit Report Form. EGSCA – Corrective Preventative Action Form.	100%
7	Top management shall ensure that roles are defined, allocating responsibilities and accountabilities and delegating authority to facilitate effective OH&S management		
7.1	Top management must appoint one	Integrated Management System Manual. Section 10.0 – Responsibility & Authority and	90%

	of their numbers to have responsibility for the SMS.	Section 11.0 – The Management Representative. Statement of Management Policy. (Currently Environment & Quality only)	
7.2	Identify who needs to do what with respect to the management of OH&S.	Integrated Management System Manual. Section 10.0 – Responsibility & Authority and Section 11.0 – The Management Representative. Statement of Management Policy. (Currently Environment & Quality only)	90%
7.3	Ensure that those identified are aware of their roles and responsibilities and what they are accountable for.	Integrated Management System Manual. Section 10.0 – Responsibility & Authority and Section 11.0 – The Management Representative. Statement of Management Policy. (Currently Environment & Quality only)	90%
7.4	Ensure that members of the organisation with OH&S responsibility have the necessary authority to fulfil their roles.	Integrated Management System Manual. Section 10.0 – Responsibility & Authority and Section 11.0 – The Management Representative. Statement of Management Policy. (Currently Environment & Quality only)	90%
7.5	Ensure that clarity is established where interfaces occur between roles and responsibilities.	Integrated Management System Manual. Section 10.0 – Responsibility & Authority and Section 11.0 – The Management Representative. Statement of Management Policy. (Currently Environment & Quality only)	90%
7.6	All managers must provide visual demonstration of their commitment to improvement in OH&S through: <ul style="list-style-type: none"> • Visits; • Inspections; • Participation in investigations; 	Integrated Management System Manual. Section 10.0 – Responsibility & Authority and Section 11.0 – The Management Representative. Statement of Management Policy.	90%

	<ul style="list-style-type: none"> Provision of resources for corrective action; and Communication and acknowledgement of good performance. 	(Currently Environment & Quality only)	
7.7	<p>Ensure that responsibilities and authorities of all persons who perform duties that are part of the OH&S management system are documented in:</p> <ul style="list-style-type: none"> SMS procedures; Operational or workplace procedures; Project/task descriptions; Job descriptions; and <p>Induction training packages.</p>	<p>IMS Manual – Section 10 Responsibility and Authority.</p> <p>(Currently Environment & Quality only)</p>	90%
8	Ensure that persons working under the control of the organisation are competent on the basis of appropriate education, training or experience to perform tasks that can impact on OH&S		
8.1	Identify tasks which can impact on OH&S, refer to risk assessments, emergency plans, roles/responsibilities etc. to do this.	<p>IMS Manual – Section 12.0 Competence, Training & Awareness.</p> <p>MP 2 – Training & Competence.</p>	100%
8.2	Determine the competence requirements for identified tasks.	<p>IMS Manual – Section 12.0 Competence, Training & Awareness.</p> <p>MP 2 – Training & Competence.</p>	100%
8.3	<p>Specific consideration must be given for those who will be:</p> <ul style="list-style-type: none"> The top management appointee; Performing risk assessment; Performing exposure assessments; Performing tasks which might introduce hazards; Performing audits; and Performing incident investigation. 	<p>IMS Manual – Section 12.0 Competence, Training & Awareness.</p> <p>MP 2 – Training & Competence.</p>	100%
8.4	Perform training or competence gap analysis and specify training/education requirements.	<p>IMS Manual – Section 12.0 Competence, Training & Awareness.</p> <p>MP 2 – Training & Competence.</p>	100%
8.5	Provide suitable training and awareness of OH&S issues for visitors, temporary employees and contractors (ensuring that literacy levels, it skills and language barriers are dealt with).	<p>IMS Manual – Section 12.0 Competence, Training & Awareness.</p> <p>MP 2 – Training & Competence.</p>	100%
8.6	Maintain training records.	EGS Energy Training Matrix	100%

8.7	Evaluate the effectiveness of training.	IMS Manual – Section 12.0 Competence, Training & Awareness. Section 27.0 Management Review. MP 2 – Training & Competence.	100%
8.8	Ensure persons working under the organisation's control are made aware of: <ul style="list-style-type: none"> • Emergency procedures; • The consequences of their actions; • The benefits of improved OH&S performance; • The potential consequences of deviating from policies or procedures; or • Any other aspect that might impact OH&S. 	EGS Energy Subcontractor Manual EGS Energy Induction process.	100%

9	With regard to its OH&S hazards and management, the organisation shall establish, implement and maintain a procedure(s) for communication		
9.1	Determine target audience.	IMS Manual. Health and Safety Policy Statement. MP 16 – Communication.	100%
9.2	Determine information needs and appropriate media.	IMS Manual. Health and Safety Policy Statement. MP 16 – Communication.	100%
9.3	Consider local culture and available technology, legal requirements and effective information flows through the organisation.	IMS Manual. Health and Safety Policy Statement. MP 16 – Communication.	100%
9.4	Remove barriers to effective communication such as literature or language.	IMS Manual. Health and Safety Policy Statement. MP 16 – Communication.	100%
9.5	Develop a procedure(s) for communication internally to include: <ul style="list-style-type: none"> • Management commitment to the SMS; • Hazards and risks; • Objectives and other continuous improvement activities; • Incident statistics; • Progress made in eliminating risks; and • Changes impacting the SMS. 	IMS Manual. Health and Safety Policy Statement. MP 16 – Communication.	100%
9.6	Based on risk, develop strategies for communicating with contractors and other visitors to the workplace	Subcontractors Manual. IMS Manual.	100%

	regarding OH&S risk;	Health and Safety Policy Statement. MP 16 – Communication.	
10	The organisation shall establish, implement and maintain a procedure(s) for consultation		
10.1	Procedures should address worker participation in development of the SMS and practices, selection of controls, improvements to performance, changes to equipment, buildings, chemicals, materials, processes and work practices - where practicable.	IMS Manual. Subcontractors Manual. Health and Safety Policy Statement. MP 16 – Communication. Management Review.	100%
10.2	The organisation should have a procedure for consultation with contractors.	IMS Manual. Subcontractors Manual. Health and Safety Policy Statement. MP 16 – Communication. Management Review.	100%
10.3	Ensure that relevant external parties are consulted about pertinent OH&S matters. These parties would include neighbours, fire brigade, Environmental Health and Environment Agency.	IMS Manual. Subcontractors Manual. Health and Safety Policy Statement. MP 16 – Communication. Management Review.	100%
11	The OH&S management system documentation shall include: <ul style="list-style-type: none"> a) the OH&S policy and objectives; b) description of the scope of the OH&S management system; c) description of the main elements of the OH&S management system and their interaction, and reference to related documents; d) documents, including records, required by this OHSAS Standard; and e) documents, including records, determined by the organisation to be necessary to ensure the effective planning, operation and control of processes that relate to the management of its OH&S risks. <p><i>NOTE It is important that documentation is proportional to the level of complexity, hazards and risks concerned and is kept to the minimum required for effectiveness and efficiency.</i></p>		
11.1	Document the SMS scope, policies and objectives.	IMS Manual Management Policy MP 13 - Objectives and targets (Currently Environment & Quality only)	70%
11.2	Maintain up to date documentation sufficient to ensure that the SMS can be adequately understood and efficiently operated.	MP 1 - Document & Data Control. (Currently Environment & Quality only)	70%
11.3	Review documentation needs before	MP 1 - Document & Data Control.	70%

	developing SMS documentation.	(Currently Environment & Quality only)	
11.4	Determine whether any task, through lack of written procedures, will not be performed in the required manner.	MP 12 - Monitoring & Measurement of processes / Internal IMS Audits.	100%
11.5	Consider production of an overview document to bridge existing manuals, procedures etc. to OHSAS 18001.	Integrated Management System (IMS) in operation. (Currently Environment & Quality only)	70%

12	The organisation shall establish, implement and maintain a procedure(s) to: a) approve documents for adequacy prior to issue; b) review and update as necessary and re-approve documents; c) ensure that changes and the current revision status of documents are identified; d) ensure that relevant versions of applicable documents are available at points of use; e) ensure that documents remain legible and readily identifiable; f) ensure that documents of external origin determined by the organisation to be necessary for the planning and operation of the OH&S management system are identified and their distribution controlled; and g) prevent the unintended use of obsolete documents and apply suitable identification to them if they are retained for any purpose.		
12.1	Define the controls for identification, approval, issue and removal of documentation.	MP 1 - Document & Data Control.	100%
12.2	Define the control of OH&S data.	MP 1 - Document & Data Control.	100%
12.3	Ensure that documents are available and accessible when required, including in non-routine or emergency situations.	MP 1 - Document & Data Control on company server.	100%
12.4	Establish a procedure(s) for identifying documents of external origin required for planning and implementing the SMS.	MP 1 - Document & Data Control.	100%
12.5	Establish a procedure(s) for ensuring that external documents are controlled and that the most current version is available (e.g. MSDS or EH40).	MP 1 - Document & Data Control.	100%
12.6	Assign responsibility for controlling and updating external documents and ensure the responsible person informs relevant staff of changes.	MP 1 - Document & Data Control.	100%
12.7	Periodically review documents which form part of the SMS.	MP 1 - Document & Data Control. Management Review. Internal Audits.	100%
12.8	Obsolete documents retained for any reason must be controlled such that they cannot re-enter the SMS.	MP 1 - Document & Data Control.	100%

12.9	Ensure archive material is adequately and appropriately stored.	MP 1 - Document & Data Control.	100%
13	The organisation shall determine those operations and activities that are associated with the identified hazard(s) where the implementation of controls is necessary to manage the OH&S risk(s). This shall include the management of change. For those operations and activities, the organisation shall implement and maintain controls and procedures.		
13.1	Control workplace and welfare hazards.	IMS Manual. Subcontractor Manual. Internal Audits.	70%
13.2	Control work activity hazards.	IMS Manual. Subcontractor Manual. Internal Audits. Occupational Risk Assessment	70%
13.3	Control the risk from use of hazardous materials.	IMS Manual. Subcontractor Manual. Internal Audits.	70%
13.4	Control plant and equipment hazards.	IMS Manual. Subcontractor Manual. Internal Audits. Occupational Risk Assessment	70%
13.5	Control purchasing of goods, services and equipment to ensure that risk is controlled by: <ul style="list-style-type: none"> specifying at an early stage purchasing rules so that goods services and equipment are always purchased with OH&S as a factor in selection; ensuring suitable RA has been carried out such that equipment complies with relevant hierarchies of risk control; informing suppliers and contractors of the organisation's OH&S requirements at an early stage; appropriate selection of competent contractors; applying a selection process based on supplier OH&S performance; and 	IMS Manual – Section 16 Purchasing and Procurement	100%

	<ul style="list-style-type: none"> implementing a contractor ongoing assessment procedure. 		
13.6	Control access and egress, signage, visitor supervision.	Induction process and site security.	100%
14	The organisation should stipulate operating criteria where they are necessary for the prevention of injury or ill health. Operating criteria should be specific to the organisation, its operations and activities, and be related to its own OH&S risks, where their absence could lead to deviation from the OH&S policy and objectives.		
14.1	For hazardous tasks: <ul style="list-style-type: none"> use of specific equipment and procedures for its use; competency requirements; use of entry control process/procedure and equipment; and procedure for individual risk assessment prior to commencement. 	Subcontractors Manual. Permit to Work (PTW)	70%
14.2	For hazardous chemicals: <ul style="list-style-type: none"> approved chemical list(s); exposure limits; specific inventory limits; and specific storage locations and conditions. 	IMS Manual.	70%
14.3	For hazardous area entries: <ul style="list-style-type: none"> specification of PPE requirements; specific entry conditions; and health and fitness conditions. 	Employee and subcontractor emergency information.	70%
14.4	For work performed by contractors: <ul style="list-style-type: none"> specification of performance criteria; specification of competency / training requirements; and specification of contractor equipment. 	MP 2 – Training and Competence. MP 21 – Subcontractors on site.	100%
14.5	For visitors: <ul style="list-style-type: none"> entry controls; PPE requirements; Site safety briefings; and Emergency requirements. 	Visitor's inductions.	100%
14.6	Operational controls should be periodically reviewed to ongoing evaluate suitability and effectiveness.	MP 12 - Monitoring and Measuring MP 12 - Internal Audits. MP 14 - Corrective and Preventive Action. IMS Manual – Section 27.0 Management Review.	100%
14.7	Procedures should be in place to	MP 12 - Internal Audits.	70%

	determine circumstances where new controls and/or modifications are needed.	MP 14 - Corrective and Preventive Action. IMS Manual – Section 27.0 Management Review.	
15	The organisation shall establish, implement and maintain a procedure(s): a) to identify the potential for emergency situations; b) to respond to such emergency situations. The organisation shall respond to actual emergency situations and prevent or mitigate associated adverse OH&S consequences. In planning its emergency response the organisation shall take account of the needs of relevant interested parties, e.g. emergency services and neighbours.		
15.1	The organisation should assess the potential for emergency situations that impact on OH&S and develop a procedure(s) for an effective response(s). This may be a stand-alone procedure(s) or be combined with other emergency response procedure(s).	IMS Manual – Section 17.3 Emergency Preparedness and Response. MP 18 – Abnormal & Emergency Situations.	100%
15.2	The organisation should periodically test its emergency preparedness and seek to improve the effectiveness of its response activities and procedure(s).	Fire Drill Emergency.	100%
15.3	When identifying potential emergency situations, consideration should be given to emergencies that can occur during both normal operations and abnormal conditions.	IMS Manual – Section 17.3 Emergency Preparedness and Response. MP 18 – Abnormal & Emergency Situations	100%
15.4	Emergency planning should also be reviewed as a part of the ongoing management of change. Changes in operations can introduce new potential emergencies or necessitate that changes be made to emergency response procedures.	IMS Manual – Section 17.3 Emergency Preparedness and Response. MP 18 – Abnormal & Emergency Situations	90%
15.5	The organisation should determine and assess how emergency situations will impact all persons within and/or in the immediate vicinity of workplaces controlled by the organisation. Consideration should be given to those with special needs, e.g. people with limited mobility, vision and hearing. This could include employees, temporary workers, contract employees, visitors, neighbours or other members of the public. The organisation should also	IMS Manual – Section 17.3 Emergency Preparedness and Response. MP 18 – Abnormal & Emergency Situations	100%

	consider potential impacts on emergency services personnel while at the workplace (e.g. fire-fighters).		
15.6	Emergency response should focus on the prevention of ill health and injury, and on the minimization of the adverse OH&S consequences to a person(s) exposed to an emergency situation.	IMS Manual – Section 17.3 Emergency Preparedness and Response. MP 18 – Abnormal & Emergency Situations	100%
15.7	A procedure(s) for responding to emergency situations should be developed and should also take into account applicable legal and other requirements.	IMS Manual – Section 17.3 Emergency Preparedness and Response. MP 18 – Abnormal & Emergency Situations	100%
15.8	Consideration should be given to the existence and/or capability of the following, in developing emergency response procedure(s): <ul style="list-style-type: none"> • inventory and location of hazardous materials storage; • numbers and locations of people; • critical systems that can impact on OH&S; • the provision of emergency training; • detection and emergency control measures; • medical equipment, first aid kits, etc.; • control systems, and any supporting secondary or parallel/multiple control systems; • monitoring systems for hazardous materials; • fire detection and suppression systems; • emergency power sources; • availability of local emergency services and details of any emergency response arrangements currently in place; • legal and other requirements; and • previous emergency response experience. 	IMS Manual – Section 17.3 Emergency Preparedness and Response. MP 18 – Abnormal & Emergency Situations Nominated Fire Warden / First Aider.	100%
15.9	Emergency response procedure(s) should define the roles, responsibilities and authorities of those with emergency response duties, especially those with an assigned duty to provide an	IMS Manual – Section 17.3 Emergency Preparedness and Response. MP 18 – Abnormal & Emergency Situations. Nominated First-Aider and Fire Warden	100%

	<p>immediate response. These personnel should be involved in the development of the emergency procedure(s) to ensure they are fully aware of the type and scope of emergencies that they can be expected to handle, as well as the arrangements needed for coordination.</p>		
15.10	<p>Emergency services personnel should be provided with the information required to facilitate their involvement in response activities.</p>	<p>IMS Manual – Section 17.3 Emergency Preparedness and Response.</p> <p>MP 18 – Abnormal & Emergency Situations.</p> <p>Nominated first-aider and fire warden</p>	100%
15.11	<p>Emergency response procedures should give consideration to the following:</p> <ul style="list-style-type: none"> • identification of potential emergency situations and locations, • details of the actions to be taken by personnel during the emergency; • evacuation procedures; • responsibilities, and authorities of personnel with specific response • duties and roles; • interface and communication with emergency services; • communication with employees (both on-site and off-site), regulators and other interested parties; • information necessary for undertaking the emergency response (emergency response providers). 	<p>IMS Manual – Section 17.3 Emergency Preparedness and Response.</p> <p>MP 18 – Abnormal & Emergency Situations.</p> <p>Nominated First-Aider and Fire Warden</p>	100%
15.12	<p>The organisation should determine and review its emergency response equipment and material needs.</p>	<p>IMS Manual – Section 17.3 Emergency Preparedness and Response.</p> <p>MP 18 – Abnormal & Emergency Situations.</p> <p>Management Review.</p> <p>Nominated First-Aider and Fire Warden</p>	100%
15.13	<p>Emergency response equipment should be available in sufficient quantity and stored in locations where it is readily accessible; it should be stored securely and be protected from being damaged. This equipment should be inspected and/or tested at regular intervals to</p>	<p>First-aid box and fire extinguisher provided in offices.</p>	100%

	ensure that it will be operational in an emergency situation.		
15.14	The type, quantity and storage location(s) for emergency equipment and supplies should be evaluated as a part of the review and testing of emergency procedures.	First-aid box and fire extinguisher provided in offices.	100%
15.15	Personnel should be trained in how to initiate the emergency response and evacuation procedures.	MP 2 - Competency & Training. IMS Manual – Section 17.3, Emergency Preparedness and Response. MP 18 – Abnormal & Emergency Situations	100%
15.16	The organisation should determine the training needed for personnel who are assigned emergency response duties and ensure that this training is received. Emergency response personnel should remain competent and capable to carry out their assigned activities.	MP 2 - Competency & Training. IMS Manual – Section 17.3, Emergency Preparedness and Response. MP 18 – Abnormal & Emergency Situations.	100%
15.17	Periodic testing of emergency procedures should be performed to ensure that the organisation and external emergency services can appropriately respond to emergency situations and prevent or mitigate associated OH&S consequences.	IMS Manual – Section 17.3 Emergency Preparedness and Response. MP 18 – Abnormal & Emergency Situations.	100%
15.18	The organisation should maintain records of emergency drills. The type of information that should be recorded includes a description of the situation and scope of the drill, a timeline of events and actions and observations of any significant achievements or problems.	IMS Manual – Section 17.3 Emergency Preparedness and Response. MP 18 – Abnormal & Emergency Situations.	100%
15.19	The organisation must review its emergency preparedness and response procedure(s) periodically. When changes are made in emergency preparedness and response procedure(s), these changes should be communicated to the personnel and functions that are impacted by the change; their associated training needs should also be evaluated.	IMS Manual – Section 17.3 Emergency Preparedness and Response. MP 18 – Abnormal & Emergency Situations. Management Review.	100%
16	The organisation shall establish, implement and maintain a procedure(s) to monitor and measure OH&S performance on a regular basis.		
16.1	An organisation should plan what	IMS Manual – Section 21.0 Monitoring and	70%

	will be measured, where and when it should be measured, what measurement methods should be used, and the competence requirements for the persons who will perform the measurements	Measurement of Processes. MP 12 – Internal Management System Audits. (Currently Environment & Quality only)	
16.2	The results of measurement and monitoring should be analysed and used to identify both successes and areas requiring correction or improvement.	IMS Manual – Section 21.0 Monitoring and Measurement of Processes. MP 12 – Internal Management System Audits. (Currently Environment & Quality only)	70%
16.3	The organisation's measuring and monitoring should use both reactive and proactive measures of performance, but should primarily focus on proactive measures in order to drive performance improvement and injury reduction.	IMS Manual – Section 21.0 Monitoring and Measurement of Processes and 29.0 Corrective & Preventative Action. MP 12 – Internal Management System Audits. (Currently Environment & Quality only)	70%
17	Consistent with its commitment to compliance the organisation shall establish, implement and maintain a procedure(s) for periodically evaluating compliance with applicable legal requirements.		
17.1	Establish a register of legislative and internal requirements.	IMS Manual – Section 9.3 Legal & Other Requirements. MP 17 – Register of Regulations.	90%
17.2	Evaluate, using competent internal and external personnel, the level of compliance and record the result.	IMS Manual – Section 12.0 Competence, Training & Awareness. MP 2 – Competence and Training.	100%
18	The organisation shall establish, implement and maintain a procedure(s) to record, investigate and analyse incidents.		
18.1	Establish and maintain procedure(s) for reporting, investigating and analysing incidents. <i>The purpose is to provide a structured, proportionate and timely approach for determining and dealing with the underlying (root) cause(s) of the incident or for determining legal issues.</i>	ESG Environmental Incident Report Form. (Currently Environment & Quality only)	30%
18.2	Define what an incident is and what sub classifications exist (e.g. LTI, RWC, Major, Environmental etc.)	ESG Environmental Incident Report Form. (Currently Environment & Quality only)	30%
18.3	Ensure all incidents are investigated.	ESG Environmental Incident Report Form. (Currently Environment & Quality only)	30%
18.4	A competent person is to define the purpose of the investigation (i.e. whether the purpose is OH&S based or whether it is to define legal issues relating to the incident). <i>Note: This rider is to allow legal privilege to be claimed to protect business continuity.</i>	ESG Environmental Incident Report Form. (Currently Environment & Quality only)	30%
18.5	Ensure that corrective actions are	ESG Environmental Incident Report Form.	30%

	subject to change management and are closed out and reviewed by a competent person.	(Currently Environment & Quality only)	
18.6	Maintain an incident register (note that the terms of the data protection act are relevant).	ESG Environmental Incident Report Form. (Currently Environment & Quality only)	30%
18.7	Ensure investigators possess the relevant competencies.	ESG Environmental Incident Report Form. (Currently Environment & Quality only)	30%
18.8	The outcomes of investigation must: a) Determine underlying OH&S deficiencies and other factors that might be causing or contributing to the occurrence of incidents; b) identify the need for corrective action; c) identify opportunities for preventive action; d) identify opportunities for continual improvement; and e) e) communicate the results of such investigations.	ESG Environmental Incident Report Form. (Currently Environment & Quality only)	30%
19	The organisation shall establish, implement and maintain a procedure(s) for dealing with actual and potential nonconformity(ies) and for taking corrective action and preventive action.		
19.1	Develop a procedure(s) for identifying nonconformities and for taking corrective and preventive action.	IMS Manual – Section 29.0 Corrective and Preventive Action. MP 14 – Corrective and Preventative Action.	100%
19.2	Identification of nonconformities should be made part of individual responsibilities, with individuals closest to the work being encouraged to report potential or actual problems.	IMS Manual – Section 29.0 Corrective and Preventive Action. MP 14 – Corrective and Preventative Action.	100%
19.3	When a potential problem is identified but no actual nonconformity exists, preventive action should be taken using a similar approach as for corrective action.	IMS Manual – Section 29.0 Corrective and Preventive Action. MP 14 – Corrective and Preventative Action.	100%
20	The organisation shall establish and maintain records as necessary to demonstrate conformity to the requirements of its OH&S management system and of BS OHSAS 18001: 2007, and the results achieved.		
20.1	Records should be maintained to demonstrate that the organisation is operating its OH&S management system effectively and is managing its OH&S risks.	IMS Manual – Section 7.0 Document and Data Control. MP 1 – Document and Data Control. (Currently Environment & Quality only)	70%
20.2	The integrity of records and data should be maintained to facilitate	IMS Manual – Section 7.0 Document and Data Control.	70%

	their subsequent use, e.g. for monitoring and review activities, for the identification of trends for preventive action, etc.	MP 1 – Document and Data Control. (Currently Environment & Quality only)	
20.3	In determining the appropriate controls for records the organisation should take into account any applicable legal requirements, confidentiality issues (particularly those relating to personnel), storage / access / disposal / back-up requirements, and the use of electronic records.	IMS Manual – Section 7.0 Document and Data Control. MP 1 – Document and Data Control.	70%
20.4	For electronic records the use of antivirus systems and off-site backup storage should be considered.	IMS Manual – Section 7.0 Document and Data Control. MP 1 – Document and Data Control.	70%
21	The organisation shall ensure that internal audits of the OH&S management system are conducted at planned intervals to: a) determine whether the OH&S management system: 1. conforms to planned arrangements for OH&S management 2. including the requirements of this OHSAS Standard; and 3. has been properly implemented and is maintained; and 4. is effective in meeting the organisation’s policy and objectives; b) provide information on the results of audits to management.		
21.1	Planned SMS audits should be carried out by personnel from within the organisation and/or by external personnel selected by the organisation, to establish whether the SMS has been properly implemented and maintained.	IMS Manual – Section 26.0 Internal IMS Audits. Audit Schedule Planner. Audit Report. (Currently Environment & Quality only)	70%
21.2	Individuals selected to conduct the OH&S management system audits should be competent and be selected in a manner to ensure objectivity and impartially in the audit process.	IMS Manual – Section 26.0 Internal IMS Audits. Audit Schedule Planner. Audit Report. (Currently Environment & Quality only)	70%
21.3	Use risk assessments to define frequency and scope of audits by establishing potential consequences of failure of a particular SMS element.	IMS Manual – Section 26.0 Internal IMS Audits. Audit Schedule Planner. Audit Report. (Currently Environment & Quality only)	70%
21.4	The organisation must develop a procedure(s) for its internal audits.	IMS Manual – Section 26.0 Internal IMS Audits. Audit Schedule Planner. Audit Report.	70%

		(Currently Environment & Quality only)	
21.5	The organisation must appoint external auditors.	I E C	100%
21.6	Roles and responsibilities must require employees to cooperate with audits and training must make the purpose of audits clear.	IMS Manual – Section 26.0 Internal IMS Audits. Audit Schedule Planner. Audit Report. (Currently Environment & Quality only)	70%
21.7	An annual audit schedule should be established and all audit plans communicated in good time.	IMS Manual – Section 26.0 Internal IMS Audits. Audit Schedule Planner. Audit Report. (Currently Environment & Quality only)	70%
21.8	The audit should ensure that a representative sample of the important activities is audited and that relevant personnel are interviewed. This can include interviews of personnel such as individual workers, employee representatives and relevant external personnel, e.g. contractors.	IMS Manual – Section 26.0 Internal IMS Audits. Audit Schedule Planner. Audit Report. (Currently Environment & Quality only)	70%
21.9	A review of the results should be carried out and effective corrective action taken, where necessary.	IMS Manual – Section 26.0 Internal IMS Audits. Audit Schedule Planner. Audit Report. (Currently Environment & Quality only)	70%
21.10	Follow-up monitoring of audit findings should be established to ensure that identified nonconformities are addressed.	IMS Manual – Section 26.0 Internal IMS Audits. Audit Schedule Planner. Audit Report. (Currently Environment & Quality only)	70%
21.11	Top management should consider OH&S management system audit findings and recommendations, and take appropriate action as necessary within an appropriate time.	IMS Manual – Section 26.0 Internal IMS Audits. Audit Schedule Planner. Audit Report. (Currently Environment & Quality only)	70%
22	Top management shall review the organisation's OH&S management system, at planned intervals, to ensure its continuing suitability, adequacy and effectiveness.		
22.1	Management reviews should focus on the overall performance of the OH&S management system with regard to: <ul style="list-style-type: none"> Suitability; 	IMS Manual – Section 27.0 Management Review. Management Review Agenda and Minutes.	100%

	<ul style="list-style-type: none"> • Adequacy ; and • Effectiveness. 		
22.2	Management reviews should be carried out by top management, on a regular basis (e.g. quarterly, semi-annually, or annually) and can be carried out by meetings or other communication means.	IMS Manual – Section 27.0 Management Review. Management Review Agenda and Minutes.	100%
22.3	Depending on the decisions and actions agreed at a review, the nature and types of communication of the results of the review, and to whom they will be communicated, should also be considered.	IMS Manual – Section 27.0 Management Review. Management Review Agenda and Minutes.	100%

Identified Gaps in BS OHSAS 18001 Requirements

Table 2 shows the items identified for further action

Table 2

1	Define and document the scope of the SMS		
1.2	Setting the scope of the SMS.	Include Health & Safety model; OHSAS 18001: 2008 in Section 4.0 and Section 6.0 of the IMS Manual.	

2	Top management define and authorise policy within SMS scope		
2.1	Record high level risk assessment to define depth/detail required.	Draft an additional Management Procedure (MP) for the Identification of Health & Safety risks.	
2.3	Develop a policy statement (also satisfying HASWA 1974) which commits, as a minimum, to: <ul style="list-style-type: none"> • Prevention of ill health and injury; • Continual improvement in OH&S management; • Continual improvement in OH&S performance; • Compliance with applicable legal requirements; and • Compliance with other requirements to which the company subscribes. 	Merge the Health & Safety Policy from the Subcontractors Manual into Section 1 of the IMS Manual.	
2.4	Develop a full OH&S policy document (see Page 12, OHSAS 18002).	As above.	

3	The organisation shall establish, implement and maintain a procedure(s) for ongoing hazard identification, risk assessment and determination of necessary controls		
3.1	Develop a methodology for hazard identification (HAZID) and suitable and sufficient risk assessment (RA).	Draft an additional Management Procedure (MP) for the Identification of Health & Safety risks. In order to ensure the RA is suitable and sufficient, develop a quantitative risk assessment form which identifies the preliminary and residual risk ratings based on a 5 x 5 matrix.	
3.2	Identify all hazards.	Include the hazard identification process in the MP for the Identification of Health & Safety risks.	
3.3	Assess the risk from those hazards, taking into account the adequacy of existing controls.	5 x 5 risk matrix required to ensure that risks are reduced to an acceptable level.	
3.4	Apply risk controls to reduce risk ALARP using an appropriate hierarchy.	Hierarchy of risk control measures is required in the MP for the Identification of Health & Safety risks.	
3.5	Implement controls.	Include details of control measures in the MP for the Identification of Health & Safety risks.	
3.6	Manage change as a result of implemented controls, including information instruction and training.	Draft a Management of Change Procedure.	
3.8	Review the RA documents on: <ul style="list-style-type: none"> • Periodic risk based frequency; • Technology change; • Legislation change; • Work method change; • Substance change; • Introduction of vulnerable person; and • After an incident. 	Include details required in the MP for the Identification of Health & Safety risks.	

4	Establish, implement and maintain a procedure(s) for identifying and assessing legal and other OH&S requirements that are applicable to it		
4.1	Establish a statute, legislation and codes of practice register with a procedure for use and nominated persons authorised to receive the information.	Check that all applicable OH&S legislation, codes of practice and guidance documents have been included in the current IMS Doc. No. 5 - Register of Regulations.	

5	Establish, implement and maintain documented OH&S objectives, at relevant functions and levels within the organisation		
5.1	Using legal requirements, prioritised list of risk assessments, employee feedback, management review, incident records etc. set objectives which are: Specific; Measurable; Achievable; Realistic; and Time limited.	Include OH&S objectives and targets in the following sections; IMS Manual – Section 9.2, 9.4 and 27.0. IMS Doc. No. 4 MP 13 – Objectives & Targets.	
5.2	Establish a programme for achieving those objectives including: <ul style="list-style-type: none"> • Designation of responsibility and authority; • The means by which the objective is to be achieved; • The time-frame in which the objective is to be achieved; and Success criteria for establishing when the objective is met.	Include OH&S objectives and targets in the following sections; IMS Manual – Sections 9.2, 9.4 and 27.0. IMS Doc. No. 4 MP 13 – Objectives & Targets.	

7	Top management shall ensure that roles are defined, allocating responsibilities and accountabilities and delegating authority to facilitate effective OH&S management		
7.1	Top management must appoint one of their numbers to have responsibility for the SMS.	Include Occupational Health & Safety in the following sections; Integrated Management System Manual, Section 11.0 – The Management Representative; and Statement of Management Policy.	
7.2	Identify who needs to do what with respect to the management of OH&S.	Include OH&S in the following sections; Integrated Management System Manual. Section 10.0 – Responsibility & Authority and Section 11.0 – The Management Representative. Statement of Management Policy.	
7.3	Ensure that those identified are aware of their roles and responsibilities and what they are accountable for.	Include OH&S in the following sections; Integrated Management System Manual. Section 10.0 – Responsibility & Authority and Section 11.0 – The Management Representative.	

		Statement of Management Policy.	
7.4	Ensure that members of the organisation with OH&S responsibility have the necessary authority to fulfil their roles.	<p>Include OH&S in the following sections;</p> <p>Integrated Management System Manual.</p> <p>Section 10.0 – Responsibility & Authority and Section 11.0 – The Management Representative.</p> <p>Statement of Management Policy.</p>	
7.5	Ensure that clarity is established where interfaces occur between roles and responsibilities.	<p>Include OH&S in the following sections;</p> <p>Integrated Management System Manual.</p> <p>Section 10.0 – Responsibility & Authority and Section 11.0 – The Management Representative.</p> <p>Statement of Management Policy.</p>	
7.6	<p>All managers must provide visual demonstration of their commitment to improvement in OH&S through:</p> <ul style="list-style-type: none"> • Visits; • Inspections; • Participation in investigations; • Provision of resources for corrective action; and • Communication and acknowledgement of good performance. 	<p>Include OH&S in the following sections;</p> <p>Integrated Management System Manual.</p> <p>Section 10.0 – Responsibility & Authority and Section 11.0 – The Management Representative.</p> <p>Statement of Management Policy.</p>	
7.7	<p>Ensure that responsibilities and authorities of all persons who perform duties that are part of the OH&S management system are documented in:</p> <ul style="list-style-type: none"> • SMS procedures; • Operational or workplace procedures; • Project/task descriptions; • Job descriptions; and <p>Induction training packages.</p>	<p>Include OH&S in the following sections;</p> <p>Integrated Management System Manual.</p> <p>Section 10.0 – Responsibility & Authority and Section 11.0 – The Management Representative.</p> <p>Statement of Management Policy.</p>	

11	<p>The OH&S management system documentation shall include:</p> <ul style="list-style-type: none"> a) the OH&S policy and objectives; b) description of the scope of the OH&S management system; c) description of the main elements of the OH&S management system and their interaction, and reference to related documents; d) documents, including records, required by this OHSAS Standard; and e) documents, including records, determined by the organisation to be necessary to ensure the effective planning, operation and control of processes that relate to the management of its OH&S risks. 	
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	NOTE It is important that documentation is proportional to the level of complexity, hazards and risks concerned and is kept to the minimum required for effectiveness and efficiency.		
11.1	Document the SMS scope, policies and objectives.	Include OH&S management in the following documents; IMS Manual Management Policy MP 13 - Objectives and targets	
11.2	Maintain up to date documentation sufficient to ensure that the SMS can be adequately understood and efficiently operated.	Include OH&S management in the following document; MP 1 - Document & Data Control.	
11.3	Review documentation needs before developing SMS documentation.	Include OH&S management in the following document; MP 1 - Document & Data Control.	
11.5	Consider production of an overview document to bridge existing manuals, procedures etc. to OHSAS 18001.	Include OH&S where applicable throughout the Integrated Management System (IMS).	

13	The organisation shall determine those operations and activities that are associated with the identified hazard(s) where the implementation of controls is necessary to manage the OH&S risk(s). This shall include the management of change. For those operations and activities, the organisation shall implement and maintain controls and procedures.		
13.1	Control workplace and welfare hazards.	Draft an additional Management Procedure (MP) for the Identification of Health & Safety risks. Develop a Management Of Change Procedure. Review the structure of the current risk assessment form.	
13.2	Control work activity hazards.	Draft an additional Management Procedure (MP) for the Identification of Health & Safety risks. Draft a Management Of Change Procedure. Review the structure of the current risk assessment form.	
13.3	Control the risk from use of hazardous materials.	Draft an additional Management Procedure (MP) for the Identification of Health & Safety risks. Draft a COSHH risk assessment form.	
13.4	Control plant and equipment	Draft an additional Management Procedure	

	hazards.	(MP) for the Identification of Health & Safety risks. Draft a Management Of Change Procedure. Draft a PUWER risk assessment procedure and form.	
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14	The organisation should stipulate operating criteria where they are necessary for the prevention of injury or ill health. Operating criteria should be specific to the organisation, its operations and activities, and be related to its own OH&S risks, where their absence could lead to deviation from the OH&S policy and objectives.		
14.1	For hazardous tasks: <ul style="list-style-type: none"> • use of specific equipment and procedures for its use; • competency requirements; • use of entry control process/procedure and equipment; and procedure for individual risk assessment prior to commencement.	Draft an additional Management Procedure (MP) for the Identification of Health & Safety risks. Draft a Management Of Change Procedure. Draft an additional MP for Permit to Work. Draft a personal risk assessment (PRA) form.	
14.2	For hazardous chemicals: <ul style="list-style-type: none"> • approved chemical list(s); • exposure limits; • specific inventory limits; and specific storage locations and conditions.	Draft an additional Management Procedure (MP) for the Identification of Health & Safety risks. Ensure Manufacturers Safety Data Sheets (MSDS) are available. Undertake COSHH risk assessments. Develop a COSHH register to log all hazardous substances / materials being used.	
14.3	For hazardous area entries: <ul style="list-style-type: none"> • specification of PPE requirements; • specific entry conditions; and health and fitness conditions.	Draft an additional MP for Permit to Work.	
14.7	Procedures should be in place to determine circumstances where new controls and/or modifications are needed.	Draft an additional Management Procedure (MP) for the Identification of Health & Safety risks. Draft an additional MP for Permit to Work.	

15	The organisation shall establish, implement and maintain a procedure(s): a) to identify the potential for emergency situations;		
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	<p>b) to respond to such emergency situations. The organisation shall respond to actual emergency situations and prevent or mitigate associated adverse OH&S consequences. In planning its emergency response the organisation shall take account of the needs of relevant interested parties, e.g. emergency services and neighbours.</p>	
15.4	<p>Emergency planning should also be reviewed as a part of the ongoing management of change. Changes in operations can introduce new potential emergencies or necessitate that changes be made to emergency response procedures.</p>	<p>Draft a Management Of Change Procedure.</p>

16	<p>The organisation shall establish, implement and maintain a procedure(s) to monitor and measure OH&S performance on a regular basis.</p>	
16.1	<p>An organisation should plan what will be measured, where and when it should be measured, what measurement methods should be used, and the competence requirements for the persons who will perform the measurements</p>	<p>Include OH&S in the following; IMS Manual – Section 21.0, Monitoring and Measurement of Processes. MP 12 – Internal Management System Audits.</p>
16.2	<p>The results of measurement and monitoring should be analysed and used to identify both successes and areas requiring correction or improvement.</p>	<p>Include OH&S in the following; IMS Manual – Section 21.0, Monitoring and Measurement of Processes. MP 12 – Internal Management System Audits.</p>
16.3	<p>The organisation’s measuring and monitoring should use both reactive and proactive measures of performance, but should primarily focus on proactive measures in order to drive performance improvement and injury reduction.</p>	<p>Include OH&S in the following; IMS Manual – Section 29.0, Corrective and Preventative Action. MP 14 – Corrective and Preventative Action.</p>

17	<p>Consistent with its commitment to compliance the organisation shall establish, implement and maintain a procedure(s) for periodically evaluating compliance with applicable legal requirements.</p>	
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17.1	Establish a register of legislative and internal requirements.	Check that all applicable OH&S legislation, codes of practice and guidance documents have been included in the current IMS Doc. No. 5 - Register of Regulations.	
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18	The organisation shall establish, implement and maintain a procedure(s) to record, investigate and analyse incidents.		
18.1	Establish and maintain procedure(s) for reporting, investigating and analysing incidents. <i>The purpose is to provide a structured, proportionate and timely approach for determining and dealing with the underlying (root) cause(s) of the incident or for determining legal issues.</i>	Draft an Incident Reporting and Investigation Policy and Procedures document.	
18.2	Define what an incident is and what sub classifications exist (e.g. LTI, RWC, Major, Environmental etc.)	Define in the Incident Reporting and Investigation Policy and Procedures document.	
18.3	Ensure all incidents are investigated.	Define the investigation process.	
18.4	A competent person is to define the purpose of the investigation (i.e. whether the purpose is OH&S based or whether it is to define legal issues relating to the incident). <i>Note: This rider is to allow legal privilege to be claimed to protect business continuity.</i>	Define in the Incident Reporting and Investigation Policy and Procedures document.	
18.5	Ensure that corrective actions are subject to change management and are closed out and reviewed by a competent person.	Ensure that corrective actions follow the Management of Change Procedure which has previously been identified as a necessity. Include OH&S in the Corrective and Preventative Action documentation.	
18.6	Maintain an incident register (note that the terms of the data protection act are relevant).	Draft and maintain an incident register.	
18.7	Ensure investigators possess the relevant competencies.	Ensure investigations are suitable and sufficient and undertaken by a competent person(s).	
18.8	The outcomes of investigation must: a) Determine underlying OH&S deficiencies and other factors that might be causing or contributing to the occurrence of incidents; b) identify the need for corrective action; c) identify opportunities for preventive action; d) identify opportunities for continual improvement; and e) communicate the results of such investigations.	Define in the Incident Reporting and Investigation Policy and Procedures document	

20	The organisation shall establish and maintain records as necessary to demonstrate conformity to the requirements of its OH&S management system and of BS OHSAS 18001: 2007, and the results achieved.		
20.1	Records should be maintained to demonstrate that the organisation is operating its OH&S management system effectively and is managing its OH&S risks.	Include OH&S in the following; IMS Manual – Section 7.0 Document and Data Control. MP 1 – Document and Data Control.	
20.2	The integrity of records and data should be maintained to facilitate their subsequent use, e.g. for monitoring and review activities, for the identification of trends for preventive action, etc.	Include OH&S in the following; IMS Manual – Section 7.0 Document and Data Control. MP 1 – Document and Data Control.	
20.3	In determining the appropriate controls for records the organisation should take into account any applicable legal requirements, confidentiality issues (particularly those relating to personnel), storage / access / disposal / back-up requirements, and the use of electronic records.	Include OH&S in the following; IMS Manual – Section 7.0 Document and Data Control. MP 1 – Document and Data Control.	
20.4	For electronic records the use of antivirus systems and off-site backup storage should be considered.	Include OH&S in the following; IMS Manual – Section 7.0 Document and Data Control. MP 1 – Document and Data Control.	

21	The organisation shall ensure that internal audits of the OH&S management system are conducted at planned intervals to: a) determine whether the OH&S management system: 1. conforms to planned arrangements for OH&S management 2. including the requirements of this OHSAS Standard; and 3. has been properly implemented and is maintained; and 4. is effective in meeting the organisation’s policy and objectives; b) provide information on the results of audits to management.		
21.1	Planned SMS audits should be carried out by personnel from within the organisation and/or by external personnel selected by the organisation, to establish whether the SMS has been properly implemented and maintained.	Include OH&S in the following; IMS Manual – Section 26.0 Internal IMS Audits. Audit Schedule Planner. Audit Report.	

21.2	Individuals selected to conduct the OH&S management system audits should be competent and be selected in a manner to ensure objectivity and impartially in the audit process.	<p>Include OH&S in the following;</p> <p>IMS Manual – Section 26.0 Internal IMS Audits.</p> <p>Audit Schedule Planner.</p> <p>Audit Report.</p>	
21.3	Use risk assessments to define frequency and scope of audits by establishing potential consequences of failure of a particular SMS element.	<p>Include OH&S in the following;</p> <p>IMS Manual – Section 26.0 Internal IMS Audits.</p> <p>Audit Schedule Planner.</p> <p>Audit Report.</p>	
21.4	The organisation must develop a procedure(s) for its internal audits.	<p>Include OH&S in the following;</p> <p>IMS Manual – Section 26.0 Internal IMS Audits.</p> <p>Audit Schedule Planner.</p> <p>Audit Report.</p>	
21.5	The organisation must appoint external auditors.	<p>Include OH&S in the following;</p> <p>IMS Manual – Section 26.0 Internal IMS Audits.</p> <p>Audit Schedule Planner.</p> <p>Audit Report.</p>	
21.6	Roles and responsibilities must require employees to cooperate with audits and training must make the purpose of audits clear.	<p>Include OH&S in the following;</p> <p>IMS Manual – Section 26.0 Internal IMS Audits.</p> <p>Audit Schedule Planner.</p> <p>Audit Report.</p>	
21.7	An annual audit schedule should be established and all audit plans communicated in good time.	<p>Include OH&S in the following;</p> <p>IMS Manual – Section 26.0 Internal IMS Audits.</p> <p>Audit Schedule Planner.</p> <p>Audit Report.</p>	
21.8	The audit should ensure that a representative sample of the important activities is audited and that relevant personnel are interviewed. This can include interviews of personnel such as	<p>Include OH&S in the following;</p> <p>IMS Manual – Section 26.0 Internal IMS Audits.</p> <p>Audit Schedule Planner.</p> <p>Audit Report.</p>	

	individual workers, employee representatives and relevant external personnel, e.g. contractors.		
21.9	A review of the results should be carried out and effective corrective action taken, where necessary.	Include OH&S in the following; IMS Manual – Section 26.0 Internal IMS Audits. Audit Schedule Planner. Audit Report.	
21.10	Follow-up monitoring of audit findings should be established to ensure that identified nonconformities are addressed.	Include OH&S in the following; IMS Manual – Section 26.0 Internal IMS Audits. Audit Schedule Planner. Audit Report.	
21.11	Top management should consider OH&S management system audit findings and recommendations, and take appropriate action as necessary within an appropriate time.	Include OH&S in the following; IMS Manual – Section 26.0 Internal IMS Audits. Audit Schedule Planner. Audit Report.	

Table 3

Regulation. Guidance.	BSOR requirements:	Effected in EGS Energy Limited by:	%
3	Application		
Regulation 3(2)	These Regulations shall apply to a self-employed person as they apply to an employer and as if that self-employed person were		

Regulation. Guidance.	BSOR requirements:	Effected in EGS Energy Limited by:	%
	both an employer and employee.		
Guidance	25 - Regulation 6(3) deals with the notification of any drilling operations 30 metres or more, other than those in connection with petroleum or deep mining, which are to take place within a mining area.		
4 Information to and general duties of the operator			
Regulation 4(1)	Where the owner is not himself the operator of a borehole site, he shall furnish the operator with all information in his possession needed to enable the operator to perform his duties under these Regulations.		
4(2)	In addition to any other duties imposed on the operator by these Regulations, it shall be the duty of the operator – (a) to exercise overall control of the borehole site; and (b) to co-ordinate the measures taken by himself and every employer and self-employed person at the site to comply with the requirements and prohibitions imposed upon them by or under the relevant statutory provisions.		
4(3)	In relation to a borehole site, any duty imposed on an employer by these Regulations shall also be imposed on the operator in so far as it relates to matters under his control.		
Guidance Appointment of operators.	29 – Owners have the option either to be the operator themselves or to appoint in writing another person to be the operator of a borehole site.		
	30 – The person appointed may be an individual person or a body of persons.		
Guidance Appointment of operators cont.	31 – These Regulations place a number of important health & safety related duties on the operator, whether he be the owner or appointed person.		
	32 – Owners, who are employers, have duties under the Health and Safety at Work etc. Act 1974		

Regulation. Guidance.	BSOR requirements:	Effected in EGS Energy Limited by:	%
	(HSW Act) to ensure, so far as reasonably practicable, the health, safety and welfare of their employees. They also have duties to conduct their undertakings in such a way as to ensure, so far as reasonably practicable, that persons not in their employment who may be affected by their undertakings are not exposed to risks to their health and safety.		
	33 – In addition, Regulation 13 of the Management of Health and Safety at Work Regulations 1999 places a duty on employers, in entrusting tasks to their employees, to take into account their capabilities as regards health and safety.		
	34 - When appointing an operator, the owner is therefore required to ensure that the demands of the appointment do not exceed the operator's ability to carry them out. Owners should take into account the competence of the operator and the capacity to discharge duties and exercise authority on the site. Individual persons or the staff of a body of persons appointed as the operator should have adequate practical and theoretical knowledge and relevant experience of the type of borehole site and borehole operations which are to be carried out there.		
	35 – An operator's competence may need to be reviewed if and when circumstances change or events require it.		
	36 – Operators may be appointed for several borehole sites providing the combined duties are reasonably within their capacity to manage the sites effectively.		
	37 – Where the operator is a body of persons, it may be appointed as the operator for a		

Regulation. Guidance.	BSOR requirements:	Effected in EGS Energy Limited by:	%
	number of sites but responsibility and authority for individual sites and where necessary individual borehole operations should be clearly defined, specified and allocated to competent individual staff. It remains, however, the duty of the appointed operator to comply with the relevant requirements under these Regulations.		
Guidance Duty of owner to furnish operator with requisite information.	44 – Regulation 4(1) recognises the need for operators of borehole sites to have available all the information necessary for them to discharge their duties under these Regulations. It puts a duty on owners to furnish appointed operators with all such information in their possession.		
	45 – In addition to seeking improvements to the safety and protection of health of persons who work at borehole sites, these Regulations are also aimed at protecting the safety of persons who do not work at borehole sites but who may be put at risk by the drilling of boreholes.		
	46 – Owners, operators and other persons entitled to drill boreholes, who may be employers, are required to comply with their general duties under the HSW Act and under these Regulations for the safety and health of persons who do not work at their borehole sites. They should take all reasonably practicable measures to ensure that they have identified how their boreholes may create hazards to persons other than their employees.		
	47 – These include in particular, underground mineworkers, visitors at tourist mines and persons working at other borehole sites. Boreholes may also create hazards to potholers, persons working in deep construction works or		

Regulation. Guidance.	BSOR requirements:	Effected in EGS Energy Limited by:	%
	underground storage facilities and persons on the surface in the case of boreholes drilled from high ground towards the surface of lower lying land or boreholes which may allow underground fluids to escape and be released at surface.		
	48 – Where owners appoint persons other than themselves to be the operators of borehole sites, they are required to ensure that they supply the operators with all the information in their possession which is relevant to the safety and health of persons on the site and persons who may be remote from it but who may be effected by it.		
Guidance General duties of the operator	49 – Regulation 4(2) places a duty on appointed operators to exercise overall control of the borehole site and to co-ordinate the measures taken by themselves and every other employer and self-employed person at the site to comply with the requirements and prohibitions imposed upon them by or under the relevant statutory provisions.		
	50 – It is not necessary for individual operators or persons acting on the behalf of a body of persons appointed as the operator to be present at a site at all times during borehole operations. Such persons should make arrangements to be contacted at any time in the event of an emergency or when direction is required.		
	51 – Operators have a duty to exercise overall control of the borehole site. They should make suitable arrangements for the effective control of the site. These should provide for competent supervision of operations, inspection of the site and the issue of necessary rules and instructions. These should take the form of written “operators		

Regulation. Guidance.	BSOR requirements:	Effected in EGS Energy Limited by:	%
	rules” or “operators instructions” or when appropriate may be direct spoken instructions. Operators should ensure that suitable are made for all rules and instruction to be received, understood and complied with by those for whom they are intended.		
	52 – They should ensure that during drilling operations and operations involved with the repair, maintenance or modification of a well, the site is constantly supervised by a competent person capable of recognising ingress of well fluids under pressure and taking the actions required to maintain the safety of the well and thereby safely restore it to normal operation.		
	53 – Operators have a duty to co-ordinate their work and their safety measures with those of other employers and self-employed persons working on site.		
	55 – Regulation 4(3) imposes on operators all the duties imposed on employers by these Regulations, so far as they relate to matters under their control. Operators therefore carry the duties scheduled in: (a) Regulation 7(4), dealing with the need to have regard to the health and safety document; (b) Regulation 9, dealing with the additional health and safety requirement; and (c) Regulation 10, dealing with health surveillance, To the extent of matters under their control.		
5	Co-operation		
Regulation 5	Every Employer of persons working at a borehole site (other than the operator) shall co-operate with the operator, to the extent necessary to enable him to		

Regulation. Guidance.	BSOR requirements:	Effected in EGS Energy Limited by:	%
	comply with the relevant statutory provisions of the site.		
Guidance	56 – Regulation 5 recognises that many borehole operations involve a number of different employers and self-employed persons who provide various specialist services. It places a duty on all employers and self-employed at work at the borehole site to co-operate with the operators as far as necessary to enable them to comply with the relevant statutory provisions. In particular, this co-operation is necessary to enable operators to co-ordinate the safety and health measures on site.		
	57 – Co-operation of employers may require them to provide information relevant to health and safety such as risk assessments for their specialist work activities, technical information relating to safe use of equipment and substances and document certifying competence of employees. It may involve the provision of special training relating to a specific site hazard or the adoption of special site rules and the taking of certain precautions peculiar to that site.		
	58 – It will require them to comply with any directions relating to health and safety given to them by or on behalf of the operator. Such directions may be general or specific. They may be given in writing in the form of operator's rules or instructions or, where appropriate, as direct spoken instructions.		
6	Notice of the commencement of drilling operations and the abandonment of boreholes		
Regulation 6(3)	Where a borehole (not being a borehole to which paragraph (1) or (2) of these Regulations relates) is being drilled within a mining area to a depth of 30 metres or more, the person		

Regulation. Guidance.	BSOR requirements:	Effected in EGS Energy Limited by:	%
	entitled to drill the borehole, within 30 days after the commencement of its drilling, shall notify to the Executive the particulars specified in Part III of Schedule 1 of these Regulations.		
6(5)	The operator of a borehole site, or in the case of particulars previously notified under 6(3), the person entitled to drill the borehole shall ensure that the Executive is notified as soon as reasonably practicable of any material change of circumstances which would affect particulars previously notified under 6(3).		
Guidance Notifications to HSE for boreholes other than for petroleum or mining	66 – Regulation 6(3) deals with the notification requirements for the drilling of boreholes not associated with petroleum or mining exploration or extraction. It applies to boreholes intended for any purpose, which are 30 metres deep or more inside a mining area. It requires that the drilling of such boreholes to a depth of 30 metres or more, within a mining area, must be notified within 30 days after the commencement of drilling.		
	67 – In cases where a series of boreholes with similar directional paths and within a specified range of depths are being drilled in close proximity within a designated area, it may be appropriate to make a collective notification for the area giving details specified in Part III of Schedule 1 of these Regulations.		
	68 – There is no requirement under these Regulations to notify the abandonment of a borehole which is not associated with petroleum or mining.		
7	The health and safety document		
Regulation 7(1)	No borehole operation shall commence at a borehole site unless the operator has ensured that a document (in these Regulations referred to as “the		

Regulation. Guidance.	BSOR requirements:	Affected in EGS Energy Limited by:	%
	<p>health and safety document”) has been prepared which –</p> <p>(a) demonstrates that the risks to which persons at the borehole site are exposed whilst they are at work have been assessed in accordance with Regulation 3 of the Management Regulations;</p> <p>(b) demonstrates that adequate measures, including measures concerning the design, use and maintenance of the borehole site and of its plant, will be taken to safeguard the health and safety of the persons working at the borehole site; and</p> <p>(c) includes a statement of how the measures referred to in subparagraph (b) will be co-ordinated.</p>		
7(2)	<p>In addition to the matters referred to in 7(1), the health and safety document shall also include where appropriate –</p> <p>(a) an escape plan with a view to providing employees with adequate opportunities for leaving work places promptly and safely in the event of danger and an associated rescue plan with a view to providing assistance where necessary;</p> <p>(b) a plan for the prevention of fire and explosion including in particular provisions for preventing blowouts and any uncontrolled escape of flammable gases and for detecting the presence of flammable gases;</p> <p>(c) a fire protection plan detailing the likely sources of fire and the precautions to be taken to protect against, detect and combat the outbreak and spread of fire; and</p> <p>(d) in the case of a borehole site where hydrogen sulphide or other harmful gases are or may be present, a plan for the detection and control of such gases and for the protection of employees from them.</p>		
7(3)	The operator shall ensure that		

Regulation. Guidance.	BSOR requirements:	Effected in EGS Energy Limited by:	%
	the health and safety document is – (a) kept up to date and revised if the borehole site has undergone major changes (including natural changes), extensions or conversions; and (b) made available to each employer of persons working at the site.		
7(4)	Each employer of persons at work at the site shall have regard to the health and safety document in meeting his obligations under the relevant statutory provisions.		
7(5)	In this Regulation, “the Management Regulations” means the Management of Health and Safety at Work Regulations 1999.		
Guidance The health and safety document should include the following -			
	Risk assessment and health and safety measures.		
	Design, use and maintenance of workplace and equipment.		
	Co-ordination of health and safety measures.		
	Arrangements for attendance of emergency services and site access.		
	Escape and rescue plan.		
	Plan for the prevention of fires, explosions, blowouts and gas escapes.		
	Hazardous zones.		
	Detection and monitoring of hazardous fluids.		
	Prevention of ignition.		
	Fire protection plan.		
	Fire detection systems.		
	Fire warning systems.		

Regulation. Guidance.	BSOR requirements:	Effected in EGS Energy Limited by:	%
	Fire fighting equipment.		
	Water for fire fighting.		
	Plan for detection and control of toxic gases.		
	Revision of the health and safety document.		
	Availability of the health and safety document.		
8			
Additional duties of the operator			
Regulation 8(1)	The operator shall ensure that every workplace on a borehole site is designed, constructed, erected and maintained and has sufficient stability to afford adequate protection for employees and to withstand the environmental forces anticipated at the site.		
8(2)	The operator shall ensure that adequate means are provided and maintained for – (a) the prompt and swift escape and where necessary the rescue of employees from workplaces in the event of danger; and (b) communicating and giving warning when escape or rescue is necessary.		
8(3)	In this Regulation “workplace” has the same meaning as in Regulation 2(1) of the Workplace (Health, Safety and Welfare) Regulations 1992.		
Guidance Stability, strength and suitability of workplaces.	214 – Workplaces include all parts of a borehole site which are made available to any person as a place of work, e.g. drilling rigs, workshops, generator rooms, engine rooms, pump rooms, control rooms, logging rooms, mud farms, storage areas, main working areas, offices and accommodation units where these are required to be on site. In addition they include all means of access to or egress from a workplace on the site, e.g. stairs, corridors, gantries, roads and evacuation routes. They do not include access roads and tracks to the borehole site.		

Regulation. Guidance.	BSOR requirements:	Effected in EGS Energy Limited by:	%
	216 – Sites should therefore be designed, constructed, erected and maintained so that they provide adequate protection to employees from hazards. A useful start at the planning stage will be to minimise the extent of hazardous zones. A secondary step will be to arrange for as many workplaces as possible to be sited outside of hazardous zones. Where workplaces are within hazardous, special protective measures will be required as detailed in other sections of this guidance.		
9 Additional health and safety requirements			
Regulation 9(1)	Subject to 9(2) of this Regulation, it shall be the duty of every employer of persons at work on a borehole site to ensure that the additional health and safety arrangements set out in Schedule 2 of these Regulations are applied as they are appropriate having regards to the nature and circumstances of the work carried on there and to the provisions of the health and safety document.		
9(2)	The additional health and safety requirements referred to in 9(1) shall apply without prejudice to the requirements of the other relevant statutory provisions relating to the borehole site.		
Guidance	223 - Regulation 9(1) requires employers, and by virtue of Regulation 4(3) operators in so far as any duty relates to matters under their control, to apply the additional health and safety requirements detailed in Schedule 2 of these Regulations as they are appropriate to the nature of the circumstances of the work carried on at the site.		
	228 – Employers should apply the additional health and safety requirements which are indicated to be appropriate by the health and safety document. If they		

Regulation. Guidance.	BSOR requirements:	Effected in EGS Energy Limited by:	%
	consider that an additional requirement is not appropriate, contrary to the content of the health and safety document, they should still comply until the discrepancy can be resolved by discussion with the operator and if necessary, the health and safety document is revised accordingly.		
10	Health surveillance		
Regulation 10(1)	An employer of a person engaged in borehole operations shall ensure that he is provided with such health surveillance as is appropriate; and where that person is assigned to the work after the coming into force of these Regulations, the health surveillance shall be commenced before he is so assigned.		
10(2)	In this Regulation “appropriate” means appropriate having regard to the nature and magnitude of the risks to the safety and health of the person referred to in 10(1).		
Guidance	230 – Regulation 6 of the Management of Health and Safety at Work Regulations 1999 requires employers to provide employees with health surveillance as is appropriate having regard to the risks identified by the risk assessment made in compliance with Regulation 3 of those Regulations.		
	231 – Regulation 10 of these Regulations, which is specific to borehole operations, requires the same provision but additionally calls for employees who are assigned to borehole operations after the coming into effect of these Regulations to be provided with appropriate health surveillance prior to being assigned to that work.		
	232 – If health surveillance e is already being carried out in		

Regulation. Guidance.	BSOR requirements:	Effected in EGS Energy Limited by:	%
	compliance with the Management of Health and Safety at Work Regulations 1999, this will fulfil part of the duty required by Regulation 10. To comply fully with this duty, employers must begin health surveillance on employees newly assigned to borehole operations prior to deploying them to that work.		
SCHEDULES			
1	PARTICULARS REQUIRED FOR NOTIFICATION UNDER REGULATION 6.		
2	ADDITIONAL HEALTH AND SAFETY REQUIREMENTS.		

Table 4

Regulation. Guidance.	DCR requirements:	Effected in EGS Energy Limited by:	%
13	General duty		
Regulation 13(1)	The well operator shall ensure that a well is so designed,		

Regulation. Guidance.	DCR requirements:	Effected in EGS Energy Limited by:	%
	<p>modified, commissioned, constructed, equipped, operated, maintained, suspended and abandoned that –</p> <p>(a) so far as is reasonably practicable, there can be no unplanned escape of fluids from the well; and</p> <p>(b) risks to the health and safety of persons from it or anything in it, or in the strata to which it is connected, are as low as is reasonably practicable.</p>		
13(2)	<p>The provisions of Regulations 14 to 19 and 21 are without prejudice to the generality of the requirements of 13(1) save that, where Regulation 17(2) places a duty on the duty holder for an installation, the well operator is not under the same duty.</p>		
Guidance	<p>22 – Regulation 13 requires the well operator to ensure the safe condition of a well at all stages in its life. So, the focus overall is on the safe physical condition of the well, rather than the actual operation being carried out in the well.</p>		
	<p>23 – The provision can be regarded as a general duty of care which is supplemented by three sub goals at Regulations 14, 15 and 16. Regulation 13 makes specific reference to “designed”, “constructed”, “commissioned”, “equipped”, “modified”, “operated”, “maintained”, “suspended” and “abandoned”. An explanation of these terms is given below:</p> <p>(a) “designed” means planning the well and specifying the necessary equipment, using all necessary information and calculations, taking account of its life cycle and subsequent use;</p> <p>(b) “constructed” means the entire process of drilling and installing equipment in it, including the initial completion of a well;</p>		

Regulation. Guidance.	DCR requirements:	Effected in EGS Energy Limited by:	%
	<p>(c) “commissioned” means the process of bringing the well into operation;</p> <p>(d) “equipped” means the selection and supply of well control, completion and well head equipment;</p> <p>(e) “modified” means replacement, removal, addition or relocation of an item of construction or change in the use of an existing well;</p> <p>(f) “operated” means the use of a completed well, e.g., production from a well, injecting gas or water into the well, gas lifting, well testing, cuttings injection;</p> <p>(g) “maintained” means keeping the well in such condition that its safe condition is not prejudiced;</p> <p>(h) “suspended” means the temporary plugging of a well;</p> <p>(i) “abandoned” means the permanent plugging of the well to prevent the release of well fluids.</p>		
14 Assessment of conditions below ground			
<p>Regulation 14(1)</p>	<p>Before the design of a well is commenced the well operator shall cause –</p> <p>(a) the geological strata and formations, and fluids within them, through which it may pass; and</p> <p>(b) any hazards which such strata and formations may contain, to be assessed.</p>		
<p>14(2)</p>	<p>The well operator shall ensure that, while an operation (including the drilling of a well) is carried out in relation to the well, those matters described in subparagraphs (a) and (b) of 14(1) shall, so far as is reasonably practicable, be kept under review and that, if any change is observed in those matters, such modification is made, where appropriate, to –</p> <p>(a) the design and construction of the well; or</p> <p>(b) any procedures,</p>		

Regulation. Guidance.	DCR requirements:	Effectuated in EGS Energy Limited by:	%
	as are necessary to ensure that the purposes described in Regulation 13(1) will continue to be fulfilled.		
Guidance Pre-design stage	25 – The well operator is required to take all appropriate steps to obtain predictions of the sub-surface environment which can be expected in the well. These should be as accurate as possible; where information is limited they should identify “worst case” conditions. These steps will help to ensure that the design of the well and the plan of work for any operations reduce the risks to people to as low as reasonably practicable.		
	26 – So far as is reasonably practicable, all potential hazards and circumstances likely to lead to unsafe well conditions should be identified by the well operator, including not only formations which may pose a hazard directly, but also those which may affect the ability to control a hazardous situation (e.g., potential loss zones, zones with the potential for causing stuck pipe and over-pressure plastic salt formations.		
Guidance Post-design stage	27 – Well-operators should ensure that sufficient measurement is taken of well conditions and sub-surface properties. This ensures that the predictions of the sub-surface environment continue to be valid and the design assumptions of the well continue to be suitable.		
15	Design with a view to suspension and abandonment		
Regulation 15	The well operator shall ensure that a well is so designed and constructed that, so far as is reasonably practicable – (a) it can be suspended or abandoned in a safe manner; and (b) after its suspension or abandonment there can be no unplanned escape of fluids from it		

Regulation. Guidance.	DCR requirements:	Effected in EGS Energy Limited by:	%
	or from the reservoir to which it lead.		
Guidance	28 – Regulation 15 reflects the life cycle approach taken to well safety in DCR, and consists of two distinct strands. First, the design and construction of the well should take into account the health and safety of the people involved in the process of suspending or abandoning it. Second, the design and construction of the well should take into account of its continuing integrity after suspension and/or abandonment, so there are no unplanned escapes of fluids from it or its reservoir.		
	29 – It is recognised that many elements of suspension and abandonment can only be decided at the time of suspension or abandonment, when actual conditions in the well can be fully assessed. However, elements which can be considered at the time of well design and during drilling will have an important bearing on the effectiveness of the subsequent suspension or abandonment.		
16			
Materials			
Regulation 16	The well operator shall ensure that every part of a well is composed of material which is suitable for achieving the purposes described in Regulation 13(1).		
Guidance	30 – This Regulation requires the well operator to ensure that all materials used in the construction and any subsequent modifications to the well are suitable for purpose, to ensure the safety of the well and so reduce to as low as is reasonably practicable any risk to the health and safety of people. This requirement will apply not only such items as cement, casing or other well tubulars, but also the		

Regulation. Guidance.	DCR requirements:	Effected in EGS Energy Limited by:	%
	well-head equipment, e.g. drilling spools, casing heads, tubing heads and the well control equipment listed under definition of “well” in Regulation 2. Where PUWER applies to equipment of in the well, no additional requirements are imposed by this Regulation.		
17 Well Control			
Regulation 17(1)	Before an operation relating to a well (including the drilling of a well) is begun elsewhere than at a site to which the Borehole Sites and Operations Regulations 1995 apply, the well operator shall ensure that suitable well control equipment is provided for use during such operations to protect against blowouts.		
17(2)	In the case of an operation to which 17(1) applies which is begun – (a) from an installation, the duty holder; and (b) otherwise than from an installation, the well operator, shall ensure that equipment provided pursuant to 17(1) is deployed when the prevailing well and operational conditions so require.		
18 Arrangements for examination			
Regulation 18(1)	Before the design of a well is commenced or adopted the well operator shall make and put into effect arrangements relating to the well of a kind described in 18(2) or, (where such arrangements already have effect in relation to another well) apply such arrangements, with any appropriate modification to the well.		
18(2)	The arrangements referred to in 18(1) are arrangement in writing for such examinations, by independent and competent persons, or any part of a well, or similar well, information, or work		

Regulation. Guidance.	DCR requirements:	Effected in EGS Energy Limited by:	%
	<p>in progress, and the making of such reports and recommendations, as are suitable for ensuring (with the assistance of such other measures as the well operator takes) that the well is so designed and constructed, and is maintained in such repair and condition that –</p> <p>(a) so far as is reasonably practicable, there can be no unplanned escape of fluids from the well; and</p> <p>(b) risks to the health and safety of persons from it or anything in it, or in strata to which it is connected, are as low as is reasonably practicable.</p>		
18(3)	The well operator shall review and revise the arrangements as often as may be appropriate.		
18(4)	The well operator shall ensure that the arrangements, any revision of them, and reports and recommendations pursuant to them are kept at an address in Great Britain notified to the Executive, until the expiration of six months after the arrangements and any revision of them cease to be current.		
Guidance	<p>40 – The examination required by this Regulation is intended to assure the well operator that the well is designed and constructed properly, and is maintained adequately. It is essential for the examination to demonstrate that the pressure boundary of the well is controlled throughout the well's life cycle and that the pressure containment equipment that forms part of the well is suitable for this purpose. It is not anticipated that examination schemes will necessarily rely on physical examination of wells. Schemes can make use of documentary evidence of well safety, providing the documents' veracity can be relied on.</p>		

Regulation. Guidance.	DCR requirements:	Effected in EGS Energy Limited by:	%
	<p>41 – An independent and competent person, who is sufficiently knowledgeable and separate from the immediate line management of the well operations involved, should do the examination. This might be someone employed by the well operators’ organisation. It is important that those carrying out the examinations work have appropriate level of impartiality and independent from pressures, especially of a financial nature. Promotion, pay and reward systems should not compromise professional judgement. Regular contact with the people concerned should result in a co-operative approach to developing an examination scheme which produces the desired assurances without undue delays or excessive paperwork.</p>		
19	Provision of drilling etc information		
<p>Regulation 19(1)</p>	<p>Where an operation to which this paragraph 19(1) applies is being carried out on a well the well operator shall cause to be sent to the Executive, at such intervals as may be agreed or, failing agreement, at intervals of one week calculated from its commencement, a report comprising the following information –</p> <ul style="list-style-type: none"> (a) the identifying number, and any slot number, of the well; (b) the name of any installation or vessel involved; (c) a summary of the activity in the course of the operation since its commencement, or the previous report; (d) the diameter and true vertical and measured depths of – <ul style="list-style-type: none"> (i) any hole drilled; and (ii) any casing installed; (e) the drilling fluid density 		

Regulation. Guidance.	DCR requirements:	Effected in EGS Energy Limited by:	%
	immediately before making the report; and (f) in the case of an existing well, its current operational state.		
19(2)	19(1) applies to – (a) a drilling operation; (b) a workover operation; (c) an abandonment operation; (d) an operation consisting in the completion of a well; (e) any other operation of a kind involving the substantial risk of the unplanned escape of fluids from the well.		
Guidance	This Regulation requires the well operator to report certain information regularly to the HSE. Information to be provided includes start and end dates, the setting of casings and the depth achieved. Current operational state means the operational activity taking place at the end of the reporting period e.g. “drilling” or “workover”; where operations have ceased; operational state would be “completed”, “suspended” or “abandoned” as appropriate.		
20			
Co-operation			
Regulation 20	Every person who is, or is to be concerned (in whatever capacity) in the operation in relation to a well (including the drilling of a well) shall co-operate with the well operator so far as necessary to enable him to discharge his duties under Regulations 1.3(1) and 17.		
Guidance	46 – It is important that the well operator, the installation operator/owner and other relevant contractors ensure that their management systems and operating procedures are sufficiently integrated to provide a safe system of work.		
21			
Information, instruction, training and supervision			
Regulation 21	In the case of a drilling, well intervention or workover		

Regulation. Guidance.	DCR requirements:	Effected in EGS Energy Limited by:	%
	<p>operation to be carried out on a well – (a) from an installation; and (b) otherwise than from an installation, the well operator,</p> <p>Shall ensure that the operation is not carried out, unless it is carried on in circumstances where the persons carrying out the operation –</p> <p>(a) have received such information, instruction and training; and (b) are being so supervised, that the risk to health and safety from such operation is reduced to the lowest level that is reasonably practicable.</p>		
Guidance	<p>49 – There are general requirements on employers in this area, which arise from other health and safety legislation, e.g. Section 2 of HSWA, Regulations 7, 8 and 9 of PUWER and Regulations 8,10,12 and 13 of MHSWR.</p>		