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| Rio Tinto Borates  **HSEQ Procedure**   |  |  |  | | --- | --- | --- | | Rio Tinto Borates  **HSEQ Procedure**  Isolation Standard Procedure | | | |  | | | | 01-HSEQ-PR-G | | | | Mgt. System Element #: | | MS Element 3 Hazard Identification and Risk Management | | Value Functions (HSEQ): | | Safety | | Document Type: | | C-1 Standard Procedure | | Site(s): | | RTB California Operations (Boron, Owens Lake, Wilmington) | | Department(s): | | All | | Hard copy control: | |  | |  | | | | Scope and Intent | | | | This standard applies to all employees and contractors.  This standard applies to all sources of hazardous energy and/or hazardous substances. The intent is to prevent injuries and fatalities from:  • hazardous energies, and/or  • hazardous substances.  The purpose of the Isolation–Lockout/Tagout (LOTO) program is to ensure that all personnel and equipment are protected from sources of hazardous energy and hazardous substances while they are performing their jobs.  **This standard does not** address the use of out of service locks that are used to close of pieces of equipment as part of a normal operating process. These locks will be identified by a lock with an orange tag and are not part of any isolation procedure.  Definitions | | | | Hazardous Energy and Hazardous Substances  Hazardous Energy: Energy that when released in an uncontrolled event can cause damage, injury or death  Hazardous Substances: Substances with the potential to cause injury, illness or death.  Examples of hazardous energy and substances include:   |  |  | | --- | --- | | **Hazardous Energy** | **Hazardous Substances** | | Electrical energy | Solids (silica, hot metal) | | Pneumatic energy | Gases (natural gas, hydrogen sulfide) | | Hydraulic energy | Vapors (acid vapor) | | Stored energy (springs, batteries) | Liquids (acids, caustics, fuels) | | Potential energy (gravity or position of equipment) | Dusts (asbestos, silica) | | Radiation | Fumes (welding or paint fume) | | Thermal energy (hot water, steam, process liquor) |  |   Authorized Isolation Employee (AIE) (*Also known as an Isolation Officer)*  Any employee who has been deemed competent in Isolation (lockout/tagout) procedures will be referred to as an Authorized Isolation Employee (AIE). Authorized Isolation Employees are only allowed to perform lockouts in the specific area in which competency was assessed.  No person may be designated as the Authorized Isolation Employee unless they are deemed competent and authorized to carry out the isolation work instruction/Isolation Lockout Form. ***Testing of voltage, for example, requires competency in electrical work as outlined in the electrical standard.***  A contractor can be an Authorized Isolation Employee if they have been deemed competent in lockout and tagout work instruction and are doing work with solely Contract employees.  When Rio Tinto employees are working with a Contractor, then a Rio Tinto Employee MUST be the Authorized Isolation Employee.  **Protective Clothing and Personal Protective Equipment**  General requirement for AIE and those that operate electrical equipment 480 volts or less (i.e. disconnect switches, circuit breakers, motor starters and etc.)  Minimum level of protective clothing:  Non melting or Untreated Natural Fiber (i.e., untreated cotton, wool, rayon, or silk, or blends of these materials) with a Fabric Weight of at Least 4.5 oz/yd2   * Shirt (long sleeve) * Pants (long) * Safety glasses or safety goggles * Hearing protection if required (ear canal inserts) * Heavy duty leather gloves   Isolation Lockout Form  Where lock stations or lock boxes are required then an Isolation Lockout Form (Isolation Permit) must be implemented and one copy attached outside of the box.  Isolation Work Instruction *(Previously called a Procedure)*  A written instruction, which may contain diagrams, illustrations, maps etc., for locking out and tagging out a specific piece of equipment. The procedure should consider: decontamination; venting of stored energy; securing of rotors or fan blades; chocking of vehicles; and disconnecting, blocking or bleeding of equipment, pipes and vessels.  Isolation Variance  A written work instruction for locking and tagging out a specific piece of equipment/system when the approved written isolation work instruction is not applicable to the work being done or when there is no written work instruction. Frequently used variances must be converted to standard isolation forms. Use the “Variance Wizard in the Safety Isolation Management (SIM)” for an isolation variance.  Lock Box  A lockable box used to secure keys whenever there is a lock out with multiple isolation points. These boxes are uniquely identified and may be either a fixed box with a transparent window to allow confirmation of the presence of system lock keys or a portable red box for a multiple lockout.  **Multiple Lockout**  When more than one isolation point is required to be isolated.  Single Lockout  When one isolation point needs to be isolated. A lockbox or clasp can be used when multiple persons are locking out.  Training Record  A documented record of all individuals who have been trained. The content of the training must be kept in a central training database. Training is structured as follows:  **General Isolation** – Training consists of Isolation awareness for purposes of identifying an Isolation lockout and understanding the meaning of isolation. After this training an employee will be allowed to use a personal lock on a lockout. This training does not allow an employee to be an Authorized Isolation Employee.  Training must include:   * Isolation Written Program, Work Instruction and Isolation Lockout Form (Permit) * Review Isolation Definitions * Review Responsibilities of Management, Authorized Isolation Employee, and General Employees * Review the Equipment Specific Isolation Work Instructions (how employees can obtain them, what to do if a procedure is incorrect) * Review Work Instruction for qualifying an Authorized Isolation Employee * Review the difference between Personal Locks, an Authorized Isolation Employee Lock, Departmental Locks and a System Lock   **Authorized Isolation Employee (Competency)** – Authorized Isolation Employees must receive training and a competency assessment (SAF-C1-002 form) on the plant or equipment they are authorized to. Authorized Isolation Employee competency assessment needs to be done before the employee is certified as an AIE whenever there is a change in job assignments; a change in machines, equipment, or processes that presents a new hazard; or a change in isolation procedures. Additional retraining must be conducted whenever the employer has reason to believe, that there are deviations from or inadequacies in the employees' knowledge or use of the isolation standard/procedure.+  **Approval training-** This training is designed to insure supervisors understand their role and responsibilities within the Isolation process**.** General Isolation training must be completed prior to receiving the approval training class.  **Refresher training** - All employees will receive annual refresher training in the department in which they are deemed competent. Isolation Locks There are five (4) types of isolation locks used as part of the Isolation Procedure. They are to be used for their intended purpose only.  These are:   1. Personal Lock 2. System Lock 3. Authorized Isolation Employee (AIE) Lock 4. Department Lock   1. Personal Lock  A lock utilized by an individual that only they can open. There must only be one key to this lock.  cid:BEADE5F7-FFF9-4705-8820-BABAB807600D  2. System Lock  A series of locks all keyed the same with only one key used to lock out multiple points of a piece of equipment or a system.  cid:363A41B9-1194-4E7D-A1F8-BB957AD26220  3. Authorized Isolation Employee Lock  cid:1546A5B5-292A-4FFB-8347-84A6C27CB201A labeled keyed alike series of locks with only one key used in conjunction with an AIE tag. The series can contain any number of locks. When keyed alike series locks are purchased all keys but one must be destroyed. A lock with one key can also be issued. The key can be passed from one Authorized Isolation Employee to another.  Examples of authorized employee locks  4. Department Lock  A lock added to a lock box in combination with a department tag when work by a department other than the AIE Department has to be performed.  cid:A130A586-164A-4E9D-A585-8ABEA371FADE  *Example of Department locks*   Out of Service Lock An orange lock used to close off equipment as part of normal operating process. These locks do not provide personal protection.      *Example of an out of service lock* Tagging There are Six (6) types of tags used as part of the Isolation Program. These are:   1. Personal Lock Identification Tags   1a. Red Temporary Lockout Tags   1. Green System Tags 2. Authorized Isolation Employee Tags 3. Department Tags - Blue, Red, Yellow and Orange 4. Out of Service Tags 5. Do Not Operate Tag   1. Personal Lock Identification Tag  A red and white tag that identifies an employee or contractor whose personal lock is in use in a lockout/tagout. An identification tag must contain the following information:   1. Personal Lock TagEmployee/Contractor Name 2. Employee Badge Number or Contractor Company Name 3. Photo of Employee/Contractor 4. Signature of Employee/Contractor 5. A warning notification e.g. Danger – Do not Operate   *Example of Personal Lock Identification Tag –*  *These tags are attached to the personal lock*  **1A. Red Temporary Lockout Tag**  A contractor who is here for a short duration job may use a red lockout tag with their name, company name, duration of job, and no photo.  If a Rio Tinto employee does not have a picture ID, that employee can use a red ID tag containing the employee’s name, payroll number, their immediate supervisor’s signature and the date. THIS TAG IS VALID FOR ONE DAY. The employee is expected to obtain picture ID tags as soon as possible.  LOTOTags    *Example of Temporary Lockout Tag*  *Material #* *41211400*  2. System Lock Tag  System Lock Tags will be attached to locks used to isolate a system. Keys to system locks should be placed in a lock box.  The System Lock Tag must:   1. Identify which lock box is being used for the isolation; and, 2. Where that lock box is located.   The system lock will be identified with a green tag.  System Lock Tag    *Example of System Lock Tag*  *Material #41212566*  3. Authorized Isolation Employee Tags   * The AIE Tag is required for ALL isolations requiring an AIE lock. * The AIE shall fill out the AIE tag and place it on the AIE lock. * The following information must be noted on the AIE tag:   + Equipment Locked Out   + The Lock Series ID associated with the isolation   + Reason for the isolation   + Department performing the isolation   + Date isolation was initiated   + Name and Signature of the AIE   Isolation Tag SAF-C1-008T    ***Example of AIE Tag***  ***Material # 41216335***  4. Department Tags  Department Lock Tags will be used by departments whenever that department needs to perform tasks (repair, clean, etc.) associated with the isolation.  This tag is one method of communicating to the AIE that the equipment is not ready to be returned to service. The department must write down the task or remaining work on the tag. This will allow production and/or departments to know status of equipment  Using this tag will allow employees from the department to remove their personal tags without releasing the equipment to the AIE.  Department Tags will be identified with colored tags by department as follows:   * Blue for maintenance including the truck shop (Material #41212462) * Red for instrumentation/electrical (Material #41212463) * Yellow for production including mine operations (Material #41212464) * Orange for Asset Management (Material #41213171)     cid:F5FDEA18-31EE-43F2-B84B-F9870A3D624C  *Examples of Departmental Tags*  5. Out of Service Tag  Used to prevent the operation of equipment where the use, operation or movement of the equipment could cause damage or extend a fault or malfunction to the plant or equipment. This tag does not provide personal protection. This will be applied with the Out of Service Lock.  OutOfService  ***Example of Out of Service Tag***  ***Material # 41213498***  6. Do Not Operate Tag  This is an informational tag used on a piece of equipment in conjunction with the Departmental lock and tag to communicate work being performed.  DSC00544    ***Example of Do Not Operate Tag***  ***Material #41209583*** Live/Unisolated Equipment Where it is necessary to work on live/unisolated equipment (for example, commissioning, decommissioning, testing, calibration, sampling, adjustments, fault finding and troubleshooting), such work shall must be carried out in accordance with a procedure and controlled by a designated person who is deemed competent and authorized. | | |   Responsibility  This section details what job titles are responsible to perform what functions under this standard.   | PERSONNEL | RESPONSIBILITY | | --- | --- | | **Management**  **(Any person with the authority to assign work to another person)** | Ensure that the isolation work instructions and program are adhered to and followed throughout the organization. This responsibility includes:   * Must be knowledgeable about Lockout/Tagout procedures in their area of responsibility. * Ensuring that employees have the resources and knowledge to properly Lockout/Tagout equipment, including time, personal locks, identification tags, and training. * Ensuring that the Lockout/Tagout program and work instructions are communicated and understood by all employees. * Ensure that all Authorized Isolation Employee’s (including those in supervision) in their area of responsibility are trained and competent for the Isolation Lockout/Tagout Work Instruction. * Ensure that written isolation work instructions are current in their area of responsibility and are audited and revised as appropriate. * Auditing and reviewing the program and compliance with it annually and revising it as appropriate. | | **Authorized Isolation Employee** | Responsible to execute the lockout/tagout work instruction for the specific piece of equipment or system that is being maintained, cleaned, serviced or repaired. This includes the following responsibilities:   * Before any work begins on plant or equipment, the AIE must first ensure that it is made safe in accordance with written isolation work instructions as documented in the “work instructions” section of this document. * The Authorized Isolation Employee lock and identification tag must be the first to be applied and the last to be removed from a lockout/tagout activity. * The AIE lock must be keyed alike as the lock will remain on the plant or equipment when handing over to subsequent shifts. * Keys to the AIE lock must only be held by other designated AIE. * After locking and tagging, the Authorized Isolation Employee communicates with any personnel in the area. The AIE must clear the area of personnel before a test step to ensure the plant or equipment has been isolated, such as trying the ON/OFF switch to ensure the system is truly locked out. * In the case of isolation for electrical work, a test for the absence of voltage must be carried out by a qualified electrician. * In the case of high voltage isolations for electrical work conductors must be grounded. This is done by a qualified electrician following the Electrical Safe Work Practices. * Communicate to the area supervisor any missing or incorrect steps with regard to the written isolation work instructions. * Where lock stations or lock boxes are required then an Isolation Lockout Form (Isolation Permit) must be implemented and one copy attached outside the box. | | **All Employees** | * All persons including the AIE, who perform work on plant, or equipment must first apply an identifiable personal lock or a lock with an identification tag in accordance with the isolation work instruction. * Ensure their personal locks are removed by themselves and that there is only one key and it is in their possession. Personal locks must be such that they can only be unlocked by the lock owner. * NEVER remove another employee’s lock unless directed to do so by a member of management in accordance with “Removal of Lock Out Lock” procedure and form SAF-C1-006. * Understand the concepts of isolation and the consequences (possible injuries or fatalities) if isolation work instructions are violated. * Strictly adhere to the facility’s isolation program and work instructions. * Use specific work instructions, but where there are none notify the supervisor and use a variance work instruction to describe the lockout used. |   Work Instruction  This section details basic isolation work instructions. Determine what is needed Whenever a piece of plant or equipment is to be isolated, there must be Work Instructions (procedures) for isolation.  Work Instruction must cover:   * Identification - identification of all energy sources and isolation points, * Isolation - the process for isolating all energy sources, * Lock - the process for lock out, * Test - the process for verifying effectiveness of the isolation, and * Re-energization - the process for safely returning the equipment to service   Before beginning any job, the Authorized Isolation Employee first determines what must be isolated and/or locked out and verifies the current written isolation work instruction is correct. The Authorized Isolation Employee must ensure that all hazardous energies into or from the equipment or system are controlled and isolated. In addition, feed, slurry, water, reagent lines may need to be disconnected, and valves locked shut, or blanked off. If the specific written isolation work instruction cannot be used as written or contains an error the Authorized Isolation Employee must contact their supervisor for a written variance to the specific isolation procedure. If an error is identified, the supervisor must be notified so the isolation work instruction and Isolation Form can be changed in the Safety Isolation Management System (SIM). 2. Single Worker, Single Isolation Point To perform a lock out on a single worker, single isolation point, you need to be qualified as an Authorized Isolation Employee (AIE) on the specific equipment being isolated.  The Authorized Isolation Employee (AIE) applies their personal lock to the piece of equipment. If that person has to leave without finishing, they must place an Authorized Isolation Employee lock and tag on the equipment before removing their personal lock.  If a second person is then assigned to work on the same equipment the Authorized Isolation Employee’s lock must be applied before the second person’s lock.  If a person is not authorized to perform an isolation, an Authorized Isolation Employee (AIE) must perform the isolation and then the unauthorized person may apply their personal lock on the clasp/scissor. 3. Multiple Lockout  * To accommodate multiple locks, the Authorized Isolation Employee uses a lockbox. * The Authorized Isolation Employee performs the lockout procedure and then places the Authorized Isolation Employee lock on the lock box. The Authorized Isolation Employee lock and tag must be the first applied and the last to be removed. * If the Authorized Isolation Employee is going to work on the equipment or system they must also apply their personal lock.  4. Verify Lockout  * On initial lockout it is the responsibility of the Authorized Isolation Employee to verify that all devices have been isolated or locked out. * Check that all stored or residual energy be isolated, relieved, restrained or otherwise rendered safe and ensures that energy cannot re-accumulate to hazardous levels during the job. * Check that all personnel are clear of the hazard. * Try to start, energize, open or operate all devices. * Correct deficiencies if found and revarify the lockout. * A verifier from each team/department doing the work must independently verify ALL lockouts * It is the responsibility of each individual to be satisfied that the lock out is correct for the scope of work being performed. * Use lock out procedures, diagrams, and illustrations etc. to find lockout locations.  5. Leaving or returning to the jobsite when work is unfinished  * If it becomes necessary to leave the assigned work area because of shift change or work reassignment, remove your personal lock. **NOTE**: An Authorized Isolation Employee’s lock and tag must be in place when all personal locks are removed. In addition, if the job is not complete, a Do Not Operate tag must be applied to any department lock and tag attached to the lock box along with a description of unfinished task. * On return it is each individual’s responsibility to be satisfied with the lockout. * The key to the isolation lock, and any information regarding the lockout, can either be passed on to the next designated Authorized Isolation Employee or deposited in the local department isolation box. The local department isolation box will be labeled “AIE Lock Key Box”. Only AIE employees can have a key to the AIE lock key box.  6. Completing Servicing or Maintenance  * When servicing or maintenance work is complete, and there is no longer any danger of exposure to the particular hazard, each person must remove their own lock and department lock if applied. * Failure to remove a lock may result in being called back to remove it without compensation. * The Authorized Isolation Employee must verify that the equipment is fit to return to operating condition prior to removing the Authorized Isolation Employee lock and tag.  7. Lock Boxes A lock box and system locks are used where the lock out will require more than a single lockout point. Isolation Lockout Form (Isolation Permit) must be implemented and attached to all lock boxes a. Lockout steps  1. The Authorized Isolation Employee (AIE) performs and verifies the system/equipment lockout placing System locks on the individual isolation points using the Safety Isolation Lockout Form and Work Instruction as guidance. The AIE is required to print and sign the Safety Isolation Lockout Form; initial each step of the lockout; identify system lock numbers; and initial that the try step has been performed. The AIE will write what work is being done in the “Special Instruction” box 2. The AIE places the system key(s) in the lock box and the AIE lock and tag is then placed on the clasp on the outside of the lock box. 3. A Verifier from the team that is performing the work, independently verifies that the isolation step is completed according to the form (locked and/or Bled) initials each task step of the Safety Isolation Lockout Form; initials that the try step has been performed; and prints their name.  *It may be done prior to the work, but a department lock needs to be attached to the box to ensure that the lockout has not changed* 4. Before work commences, the Approver (supervisor) will verify that the Safety Isolation Lockout Form has been filled out properly and signs in the “Approved By:” section. AIE and verifier complete their steps and document before supervisor approval. Supervisor will confirm lock box is setup properly including AIE lock and tag in place. Any questions should be resolved with AIE or verifier before approving, will verify that the Safety Isolation Lockout Form has been filled out properly and signs in the “Approved by signature”.  They are not required to walk down the system. 5. The AIE ensures that the Isolation Lockout Form (Isolation Permit) for the system and/or any variances are attached to the lock box. The Isolation Lockout Form (Isolation Permit) specifies what area(s) are protected by the system lock and the description and/or tag number of the isolation points. 6. Once an AIE lock and Isolation Permit is in place and another department needs to perform work on the equipment, their Department lock and tag is attached to the lockbox 7. Personnel, whose job activities require they use lockout protection in the affected area, place their personal lock and tag on the lock box. It is each individuals responsibility to :  * Review the posted lockout form (Isolation Permit) to confirm that the lock box covers their job. * Be satisfied the lock out is correct.   cid:98EB02A2-14D2-4B47-871C-DB9A94D5D8BB8. If the job is not complete at the end of the shift a Do Not Operate tag needs to be attached to any departmental locks with a description of the unfinished task.  *Example of a Lock Box* b. Test Running Equipment in a Lockout To test run a piece of equipment in the work area protected by the system lock the following steps apply:   1. Each person involved removes his or her personal lock from the lock box and clears the area. 2. The Authorized Isolation Employee, responsible for the system lockout during this portion of the work, checks to ensure the area is clear, removes the Authorized Isolation Employee Lock from the lock box. 3. All System keys must be locked up or in the possession of the Authorized Isolation Employee during the test running of equipment. 4. When the required test work is completed, the system is re-locked out by the Authorized Isolation Employee, verified and approved as per procedure.  8. Removal of a Personal, System or Isolation lock from a Lockout Perform the following steps when a personal, system or isolation lock is found on a piece of equipment or system that is required to be started. Reference form “Removal of Lockout Lock”, (SAF-C1-006)   1. Determine whose lock is on the equipment. 2. **Personal locks** must only be removed by the lock owner. If the lock owner is not available the lock must only be removed with the authorization of the site Manager (General Manager for Boron Operations) or her/his appointed nominee and in accordance with a procedure. 3. If the employee cannot be found on company property, then notify the appropriate Supervisor or management member that the lock or locks might need to be cut off. 4. The appropriate Supervisor will then follow all steps on the form “Removal of Lockout Lock”, (SAF-C1-006). 5. A meeting to review the circumstances requiring the lock removal will be held. This meeting will involve the General Manager, Area Manager, and others if required. The purpose of this review is to find the root cause of why the lock was left on, and discuss methods to prevent reoccurrence. 6. The employee whose lock had to be removed is notified of the event upon return to company property.  9. Adding, Changing, or Deleting the Isolation Work Instruction  1. Upon approval of the new or revised isolation work instruction, the latest revision will be posted to the RTM SharePoint Boron Site in the SIM Safety Isolation Manager by the Area Isolation Champion. All outdated versions will be removed from the intranet and archived 2. Adding a new work instruction:   2.1 The person requesting a new isolation work instruction should complete the “Request for New Isolation Work Instruction” form. That form and a draft of the work instruction should be submitted to the Area Isolation Champion.   * 1. The Draft will be typed and formatted by the Area Isolation Champion and returned to the originator for review prior to posting to the RTM SharePoint Boron Site in the SIM Safety Isolation Manager.   2. When new equipment is installed, the following steps are taken:      1. New equipment requires following the Management of Change Procedure by the designated project manager or end user of the new equipment.      2. Equipment is designed to include and minimize the number and/or complexity of lockable isolation points.      3. Prior to the equipment or system being commissioned and handed over, a new isolation work instruction will be completed by the designated project manager or end user.  1. Revising an existing work instruction    1. The person requesting a revised isolation work instruction should submit a draft of the procedure to the Area Isolation Champion with a completed “Request for Revised Isolation Work Instruction” form.    2. The Draft will be typed and formatted by the Area Isolation Champion and returned to the originator for review prior to posting to the RTM SharePoint Boron Site in the SIM Safety Isolation Manager.    3. The Area Isolation Champion will replace the existing work instruction on the RTM SharePoint Boron Site in the SIM Safety Isolation Manager 2. Deleting an existing work instruction    1. The person requesting the deletion of an isolation work instruction should complete a “Request for Revised Isolation Work Instruction” form. On this form the reason for the deletion must be explained.    2. The Area Isolation Champion will archive the work instruction and delete the document from the RTM SharePoint Boron Site in the SIM Safety Isolation Manager.   Isolation Standard Procedure | | | |
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| 01-HSEQ-PR-G | | | |
| Mgt. System Element #: | | MS Element 3 Hazard Identification and Risk Management | |
| Value Functions (HSEQ): | | Safety | |
| Document Type: | | C-1 Standard Procedure | |
| Site(s): | | RTB California Operations (Boron, Owens Lake, Wilmington) | |
| Department(s): | | All | |
| Hard copy control: | |  | |
|  | | | |
| Scope and Intent | | | |
| This standard applies to all employees and contractors.  This standard applies to all sources of hazardous energy and/or hazardous substances. The intent is to prevent injuries and fatalities from:  • hazardous energies, and/or  • hazardous substances.  The purpose of the Isolation–Lockout/Tagout (LOTO) program is to ensure that all personnel and equipment are protected from sources of hazardous energy and hazardous substances while they are performing their jobs.  **This standard does not** address the use of out of service locks that are used to close of pieces of equipment as part of a normal operating process. These locks will be identified by a lock with an orange tag and are not part of any isolation procedure.  Definitions | | | |
| **Hazardous Energy and Hazardous Substances**  Hazardous Energy: Energy that when released in an uncontrolled event can cause damage, injury or death  Hazardous Substances: Substances with the potential to cause injury, illness or death.  Examples of hazardous energy and substances include:   |  |  | | --- | --- | | **Hazardous Energy** | **Hazardous Substances** | | Electrical energy | Solids (silica, hot metal) | | Pneumatic energy | Gases (natural gas, hydrogen sulfide) | | Hydraulic energy | Vapors (acid vapor) | | Stored energy (springs, batteries) | Liquids (acids, caustics, fuels) | | Potential energy (gravity or position of equipment) | Dusts (asbestos, silica) | | Radiation | Fumes (welding or paint fume) | | Thermal energy (hot water, steam, process liquor) |  |   **Authorized Isolation Employee (AIE)** (*Also known as an Isolation Officer)*  Any employee who has been deemed competent in Isolation (lockout/tagout) procedures will be referred to as an Authorized Isolation Employee (AIE). Authorized Isolation Employees are only allowed to perform lockouts in the specific area in which competency was assessed.  No person may be designated as the Authorized Isolation Employee unless they are deemed competent and authorized to carry out the isolation work instruction/Isolation Lockout Form. ***Testing of voltage, for example, requires competency in electrical work as outlined in the electrical standard.***  A contractor can be an Authorized Isolation Employee if they have been deemed competent in lockout and tagout work instruction and are doing work with solely Contract employees.  When Rio Tinto employees are working with a Contractor, then a Rio Tinto Employee MUST be the Authorized Isolation Employee.  **Protective Clothing and Personal Protective Equipment**  General requirement for AIE and those that operate electrical equipment 480 volts or less (i.e. disconnect switches, circuit breakers, motor starters and etc.)  Minimum level of protective clothing:  Non melting or Untreated Natural Fiber (i.e., untreated cotton, wool, rayon, or silk, or blends of these materials) with a Fabric Weight of at Least 4.5 oz/yd2   * Shirt (long sleeve) * Pants (long) * Safety glasses or safety goggles * Hearing protection if required (ear canal inserts) * Heavy duty leather gloves   **Isolation Lockout Form**  Where lock stations or lock boxes are required then an Isolation Lockout Form (Isolation Permit) must be implemented and one copy attached outside of the box.  **Isolation Work Instruction** *(Previously called a Procedure)*  A written instruction, which may contain diagrams, illustrations, maps etc., for locking out and tagging out a specific piece of equipment. The procedure should consider: decontamination; venting of stored energy; securing of rotors or fan blades; chocking of vehicles; and disconnecting, blocking or bleeding of equipment, pipes and vessels.  **Isolation Variance**  A written work instruction for locking and tagging out a specific piece of equipment/system when the approved written isolation work instruction is not applicable to the work being done or when there is no written work instruction. Frequently used variances must be converted to standard isolation forms. Use the “Variance Wizard in the Safety Isolation Management (SIM)” for an isolation variance.  **Lock Box**  A lockable box used to secure keys whenever there is a lock out with multiple isolation points. These boxes are uniquely identified and may be either a fixed box with a transparent window to allow confirmation of the presence of system lock keys or a portable red box for a multiple lockout.  **Multiple Lockout**  When more than one isolation point is required to be isolated.  **Single Lockout**  When one isolation point needs to be isolated. A lockbox or clasp can be used when multiple persons are locking out.  **Double block and Bleed**  When isolating a tank or vessel for confined space entry, all flows into and out of the system must be double blocked and bled.  **Training Record**  A documented record of all individuals who have been trained. The content of the training must be kept in a central training database. Training is structured as follows:  **General Isolation** – Training consists of Isolation awareness for purposes of identifying an Isolation lockout and understanding the meaning of isolation. After this training an employee will be allowed to use a personal lock on a lockout. This training does not allow an employee to be an Authorized Isolation Employee.  Training must include:   * Isolation Written Program, Work Instruction and Isolation Lockout Form (Permit) * Review Isolation Definitions * Review Responsibilities of Management, Authorized Isolation Employee, and General Employees * Review the Equipment Specific Isolation Work Instructions (how employees can obtain them, what to do if a procedure is incorrect) * Review Work Instruction for qualifying an Authorized Isolation Employee * Review the difference between Personal Locks, an Authorized Isolation Employee Lock, Departmental Locks and a System Lock   **Authorized Isolation Employee (Competency)** – Authorized Isolation Employees must receive training and a competency assessment (SAF-C1-002 form) on the plant or equipment they are authorized to. Authorized Isolation Employee competency assessment needs to be done before the employee is certified as an AIE whenever there is a change in job assignments; a change in machines, equipment, or processes that presents a new hazard; or a change in isolation procedures. Additional retraining must be conducted whenever the employer has reason to believe, that there are deviations from or inadequacies in the employees' knowledge or use of the isolation standard/procedure.+  **Approval training-** This training is designed to insure supervisors understand their role and responsibilities within the Isolation process**.** General Isolation training must be completed prior to receiving the approval training class.  **Refresher training** - All employees will receive annual refresher training in the department in which they are deemed competent.  ***Isolation Locks***  There are four (4) types of isolation locks used as part of the Isolation Procedure. They are to be used for their intended purpose only.  These are:   1. Personal Lock 2. System Lock 3. Authorized Isolation Employee (AIE) Lock 4. Department Lock   **1. Personal Lock**  A lock utilized by an individual that only they can open. There must only be one key to this lock.  cid:BEADE5F7-FFF9-4705-8820-BABAB807600D  **2. System Lock**  A series of locks all keyed the same with only one key used to lock out multiple points of a piece of equipment or a system. Keys to system locks must be placed in a lock box.  cid:363A41B9-1194-4E7D-A1F8-BB957AD26220  **3. Authorized Isolation Employee Lock**  cid:CEAF73FC-8AB6-4E5F-ACDD-6DBB17F06958A labeled keyed alike series of locks with only one key used in conjunction with an AIE tag. The series can contain any number of locks. When keyed alike series locks are purchased all keys but one must be destroyed. A lock with one key can also be issued. The key can be passed from one Authorized Isolation Employee to another.  Examples of authorized employee locks  **4. Department Lock**  cid:A130A586-164A-4E9D-A585-8ABEA371FADEA lock added to a lock box in combination with a department tag when work by a department other than the AIE Department has to be performed.  *Example of Department locks*    ***Out of Service Lock***  An orange lock used to close off equipment as part of normal operating process. These locks do not provide personal protection.      *Example of an out of service lock*  ***Tagging***  There are Six (6) types of tags used as part of the Isolation Program. These are:   1. Personal Lock Identification Tags   1a. Red Temporary Lockout Tags   1. Green System Tags 2. Authorized Isolation Employee Tags 3. Department Tags - Blue, Red, Yellow and Orange 4. Out of Service Tags 5. Do Not Operate Tag   **1. Personal Lock Identification Tag**  A red and white tag that identifies an employee or contractor whose personal lock is in use in a lockout/tagout. An identification tag must contain the following information:  Personal Lock Tag1. Employee/Contractor Name   1. Employee Badge Number or Contractor Company Name 2. Photo of Employee/Contractor 3. Signature of Employee/Contractor 4. A warning notification e.g. Danger – Do not Operate   *Example of Personal Lock Identification Tag –*  *These tags are attached to the personal lock*  **1A. Red Temporary Lockout Tag**  A contractor who is here for a short duration job may use a red lockout tag with their name, company name, duration of job, and no photo.  If a Rio Tinto employee does not have a picture ID, that employee can use a red ID tag containing the employee’s name, payroll number, their immediate supervisor’s signature and the date. THIS TAG IS VALID FOR ONE DAY. The employee is expected to obtain picture ID tags as soon as possible.  LOTOTags    *Example of Temporary Lockout Tag*  *Material #* *41211400*  **2. System Lock Tag**  System Lock Tags will be attached to locks used to isolate a system.  The System Lock Tag must:   1. Identify which lock box is being used for the isolation; and, 2. Where that lock box is located.   The system lock will be identified with a green tag.  System Lock Tag    *Example of System Lock Tag*  *Material #41212566*  **3. Authorized Isolation Employee Tags**   * The AIE Tag is required for ALL isolations requiring an AIE lock. * The AIE shall fill out the AIE tag and place it on the AIE lock. * The following information must be noted on the AIE tag:   + Equipment Locked Out   + The Lock Series ID associated with the isolation   + Reason for the isolation   + Department performing the isolation   + Date isolation was initiated   + Name and Signature of the AIE   Isolation Tag SAF-C1-008T    ***Example of AIE Tag***  ***Material # 41216335***  **4. Department Tags**  Department Lock Tags will be used by departments whenever that department needs to perform tasks (repair, clean, etc.) associated with the isolation.  Using this tag will allow employees from the department to remove their personal tags without releasing the equipment to the AIE.  Department Tags will be identified with colored tags by department as follows:   * Blue for maintenance including the truck shop (Material #41212462) * Red for instrumentation/electrical (Material #41212463) * Yellow for production including mine operations (Material #41212464) * Orange for Asset Management (Material #41213171)     cid:F5FDEA18-31EE-43F2-B84B-F9870A3D624C  *Examples of Departmental Tags*  **5. Out of Service Tag**  Used to prevent the operation of equipment where the use, operation or movement of the equipment could cause damage or extend a fault or malfunction to the plant or equipment. This tag does not provide personal protection. This will be applied with the Out of Service Lock.  OutOfService  ***Example of Out of Service Tag***  ***Material # 41213498***  **6. Do Not Operate Tag**  This is an informational tag used on a piece of equipment in conjunction with the Departmental lock and tag. This tag is one method of communicating to the AIE that the equipment is not ready to be returned to service. The department must write down the task or remaining work on the tag. This will allow production and/or departments to know status of equipment.    DSC00544    ***Example of Do Not Operate Tag***  ***Material #41209583***  ***Live/Unisolated Equipment***  Where it is necessary to work on live/unisolated equipment (for example, commissioning, decommissioning, testing, calibration, sampling, adjustments, fault finding and troubleshooting), such work shall must be carried out in accordance with a procedure and controlled by a designated person who is deemed competent and authorized. | |

Responsibility

This section details what job titles are responsible to perform what functions under this standard.

| **PERSONNEL** | **RESPONSIBILITY** |
| --- | --- |
| **Management**  **(Any person with the authority to assign work to another person)** | Ensure that the isolation work instructions and program are adhered to and followed throughout the organization. This responsibility includes:   * Must be knowledgeable about Lockout/Tagout procedures in their area of responsibility. * Ensuring that employees have the resources and knowledge to properly Lockout/Tagout equipment, including time, personal locks, identification tags, and training. * Ensuring that the Lockout/Tagout program and work instructions are communicated and understood by all employees. * Ensure that all Authorized Isolation Employee’s (including those in supervision) in their area of responsibility are trained and competent for the Isolation Lockout/Tagout Work Instruction. * Ensure that written isolation work instructions are current in their area of responsibility and are audited and revised as appropriate. * Auditing and reviewing the program and compliance with it annually and revising it as appropriate. |
| **Authorized Isolation Employee** | Responsible to execute the lockout/tagout work instruction for the specific piece of equipment or system that is being maintained, cleaned, serviced or repaired. This includes the following responsibilities:   * Before any work begins on plant or equipment, the AIE must first ensure that it is made safe in accordance with written isolation work instructions as documented in the “work instructions” section of this document. * The Authorized Isolation Employee lock and identification tag must be the first to be applied and the last to be removed from a lockout/tagout activity. * The AIE lock must be keyed alike as the lock will remain on the plant or equipment when handing over to subsequent shifts. * Keys to the AIE lock must only be held by other designated AIE. * After locking and tagging, the Authorized Isolation Employee communicates with any personnel in the area. The AIE must clear the area of personnel before a test step to ensure the plant or equipment has been isolated, such as trying the ON/OFF switch to ensure the system is truly locked out. * In the case of isolation for electrical work, a test for the absence of voltage must be carried out by a qualified electrician. * In the case of high voltage isolations for electrical work conductors must be grounded. This is done by a qualified electrician following the Electrical Safe Work Practices. * Communicate to the area supervisor any missing or incorrect steps with regard to the written isolation work instructions. * Where lock stations or lock boxes are required then an Isolation Lockout Form (Isolation Permit) must be implemented and one copy attached outside the box. |
| **All Employees** | * All persons including the AIE, who perform work on plant, or equipment must first apply an identifiable personal lock or a lock with an identification tag in accordance with the isolation work instruction. * Ensure their personal locks are removed by themselves and that there is only one key and it is in their possession. Personal locks must be such that they can only be unlocked by the lock owner. * NEVER remove another employee’s lock unless directed to do so by a member of management in accordance with “Removal of Lock Out Lock” procedure and form SAF-C1-006. * Understand the concepts of isolation and the consequences (possible injuries or fatalities) if isolation work instructions are violated. * Strictly adhere to the facility’s isolation program and work instructions. * Use specific work instructions, but where there are none notify the supervisor and use a variance work instruction to describe the lockout used. |

Work Instruction

This section details basic isolation work instructions.

1. **Determine what is needed**

Whenever a piece of plant or equipment is to be isolated, there must be Work Instructions (procedures) for isolation.

Work Instruction must cover:

* Identification - identification of all energy sources and isolation points,
* Isolation - the process for isolating all energy sources,
* Lock - the process for lock out,
* Test - the process for verifying effectiveness of the isolation, and
* Re-energization - the process for safely returning the equipment to service

Before beginning any job, the Authorized Isolation Employee first determines what must be isolated and/or locked out and verifies the current written isolation work instruction is correct. The Authorized Isolation Employee must ensure that all hazardous energies into or from the equipment or system are controlled and isolated. In addition, feed, slurry, water, reagent lines may need to be disconnected, and valves locked shut, or blanked off. If the specific written isolation work instruction cannot be used as written or contains an error the Authorized Isolation Employee must contact their supervisor for a written variance to the specific isolation procedure. If an error is identified, the supervisor must be notified so the isolation work instruction and Isolation Form can be changed in the Safety Isolation Management System (SIM).

**2. Single Worker, Single Isolation Point**

To perform a lock out on a single worker, single isolation point, you need to be qualified as an Authorized Isolation Employee (AIE) on the specific equipment being isolated.

The Authorized Isolation Employee (AIE) applies their personal lock to the piece of equipment. If that person has to leave without finishing, they must place an Authorized Isolation Employee lock and tag on the equipment before removing their personal lock.

If a second person is then assigned to work on the same equipment the Authorized Isolation Employee’s lock must be applied before the second person’s lock.

If a person is not authorized to perform an isolation, an Authorized Isolation Employee (AIE) must perform the isolation and then the unauthorized person may apply their personal lock on the clasp/scissor. A department lock must be applied to a lock box in combination with a department tag when work by a department other than the AIE Department has to be performed

**3. Multiple Lockout**

* To accommodate multiple locks, the Authorized Isolation Employee uses a lockbox.
* The Authorized Isolation Employee performs the lockout procedure and then places the Authorized Isolation Employee lock on the lock box. The Authorized Isolation Employee lock and tag must be the first applied and the last to be removed.
* A department lock must be applied to the lock box in combination with a department tag when work by a department other than the AIE Department has to be performed.
* If the Authorized Isolation Employee is going to work on the equipment or system they must also apply their personal lock.

**4. Verify Lockout**

* On initial lockout it is the responsibility of the Authorized Isolation Employee to verify that all devices have been isolated or locked out.
* Check that all stored or residual energy be isolated, relieved, restrained or otherwise rendered safe and ensures that energy cannot re-accumulate to hazardous levels during the job.
* Check that all personnel are clear of the hazard.
* Try to start, energize, open or operate all devices.
* Correct deficiencies if found and revarify the lockout.
* A verifier from each team/department doing the work must independently verify ALL lockouts
* It is the responsibility of each individual to be satisfied that the lock out is correct for the scope of work being performed.
* Use lock out procedures, diagrams, and illustrations etc. to find lockout locations.

**5. Leaving or returning to the jobsite when work is unfinished**

* If it becomes necessary to leave the assigned work area because of shift change or work reassignment, remove your personal lock. **NOTE**: An Authorized Isolation Employee’s lock and tag must be in place when all personal locks are removed. In addition, if the job is not complete, a Do Not Operate tag must be applied to any department lock and tag attached to the lock box along with a description of unfinished task.
* On return it is each individual’s responsibility to be satisfied with the lockout.
* The key to the isolation lock, and any information regarding the lockout, can either be passed on to the next designated Authorized Isolation Employee or deposited in the local department isolation box. The local department isolation box will be labeled “AIE Lock Key Box”. Only AIE employees can have a key to the AIE lock key box.

**6. Completing Servicing or Maintenance**

* When servicing or maintenance work is complete, and there is no longer any danger of exposure to the particular hazard, each person must remove their own lock and department lock if applied.
* Failure to remove a lock may result in being called back to remove it without compensation.
* The Authorized Isolation Employee must verify that the equipment is fit to return to operating condition prior to removing the Authorized Isolation Employee lock and tag.

**7. Lock Boxes**

A lock box and system locks are used where the lock out will require more than a single lockout point. Isolation Lockout Form (Isolation Permit) must be implemented and attached to all lock boxes

***a. Lockout steps***

1. The Authorized Isolation Employee (AIE) performs and verifies the system/equipment lockout placing System locks on the individual isolation points using the Safety Isolation Lockout Form and Work Instruction as guidance. The AIE is required to print and sign the Safety Isolation Lockout Form; initial each step of the lockout; identify system lock numbers; and initial that the try step has been performed. The AIE will write what work is being done in the “Special Instruction” box
2. The AIE places the system key(s) in the lock box and the AIE lock and tag is then placed on the clasp on the outside of the lock box.
3. A Verifier from the team that is performing the work, independently verifies that the isolation step is completed according to the form (locked and/or Bled) initials each task step of the Safety Isolation Lockout Form; initials that the try step has been performed; and prints their name.  *It may be done prior to the work, but a department lock needs to be attached to the box to ensure that the lockout has not changed*
4. Before work commences, the Approver (supervisor) will verify that the Safety Isolation Lockout Form has been filled out properly and signs in the “Approved By:” section. AIE and verifier complete their steps and document before supervisor approval. Supervisor will confirm lock box is setup properly including AIE lock and tag in place. Any questions should be resolved with AIE or verifier before approving, will verify that the Safety Isolation Lockout Form has been filled out properly and signs in the “Approved by signature”.  They are not required to walk down the system.
5. The AIE ensures that the Isolation Lockout Form (Isolation Permit) for the system and/or any variances are attached to the lock box. The Isolation Lockout Form (Isolation Permit) specifies what area(s) are protected by the system lock and the description and/or tag number of the isolation points.
6. Once an AIE lock and Isolation Permit is in place and another department needs to perform work on the equipment, their Department lock and tag is attached to the lockbox
7. Personnel, whose job activities require they use lockout protection in the affected area, place their personal lock and tag on the lock box. It is each individuals responsibility to :

* Review the posted lockout form (Isolation Permit) to confirm that the lock box covers their job.
* Be satisfied the lock out is correct.

8. If the job is not complete at the end of the shift a Do Not Operate tag needs to be attached to any departmental locks with a description of the unfinished task.

*Example of a Lock Box*

***b. Test Running Equipment in a Lockout***

To test run a piece of equipment in the work area protected by the system lock the following steps apply:

1. Each person involved removes his or her personal lock from the lock box and clears the area.
2. The Authorized Isolation Employee, responsible for the system lockout during this portion of the work, checks to ensure the area is clear, removes the Authorized Isolation Employee Lock from the lock box.
3. All System keys must be locked up or in the possession of the Authorized Isolation Employee during the test running of equipment.
4. When the required test work is completed, the system is re-locked out by the Authorized Isolation Employee, verified and approved as per procedure.

**8. Removal of a Personal, System or Isolation lock from a Lockout**

Perform the following steps when a personal, system or isolation lock is found on a piece of equipment or system that is required to be started. Reference form “Removal of Lockout Lock”, (SAF-C1-006)

1. Determine whose lock is on the equipment.
2. **Personal locks** must only be removed by the lock owner. If the lock owner is not available the lock must only be removed with the authorization of the site Manager (General Manager for Boron Operations) or her/his appointed nominee and in accordance with a procedure.
3. If the employee cannot be found on company property, then notify the appropriate Supervisor or management member that the lock or locks might need to be cut off.
4. The appropriate Supervisor will then follow all steps on the form “Removal of Lockout Lock”, (SAF-C1-006).
5. A meeting to review the circumstances requiring the lock removal will be held. This meeting will involve the General Manager, Area Manager, and others if required. The purpose of this review is to find the root cause of why the lock was left on, and discuss methods to prevent reoccurrence.
6. The employee whose lock had to be removed is notified of the event upon return to company property.

**9. Adding, Changing, or Deleting the Isolation Work Instruction**

1. Upon approval of the new or revised isolation work instruction, the latest revision will be posted to the RTM SharePoint Boron Site in the SIM Safety Isolation Manager by the Area Isolation Champion. All outdated versions will be removed from the intranet and archived
2. Adding a new work instruction:

2.1 The person requesting a new isolation work instruction should complete the “Request for New Isolation Work Instruction” form. That form and a draft of the work instruction should be submitted to the Area Isolation Champion.

* 1. The Draft will be typed and formatted by the Area Isolation Champion and returned to the originator for review prior to posting to the RTM SharePoint Boron Site in the SIM Safety Isolation Manager.
  2. When new equipment is installed, the following steps are taken:
     1. New equipment requires following the Management of Change Procedure by the designated project manager or end user of the new equipment.
     2. Equipment is designed to include and minimize the number and/or complexity of lockable isolation points.
     3. Prior to the equipment or system being commissioned and handed over, a new isolation work instruction will be completed by the designated project manager or end user.

1. Revising an existing work instruction
   1. The person requesting a revised isolation work instruction should submit a draft of the procedure to the Area Isolation Champion with a completed “Request for Revised Isolation Work Instruction” form.
   2. The Draft will be typed and formatted by the Area Isolation Champion and returned to the originator for review prior to posting to the RTM SharePoint Boron Site in the SIM Safety Isolation Manager.
   3. The Area Isolation Champion will replace the existing work instruction on the RTM SharePoint Boron Site in the SIM Safety Isolation Manager
2. Deleting an existing work instruction
   1. The person requesting the deletion of an isolation work instruction should complete a “Request for Revised Isolation Work Instruction” form. On this form the reason for the deletion must be explained.
   2. The Area Isolation Champion will archive the work instruction and delete the document from the RTM SharePoint Boron Site in the SIM Safety Isolation Manager.