

High Risk work and red flags for dangerous working

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Bio 个人简介

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- Head of HSE Expert, APAC Based in Singapore
- Master in Environmental Engineering, Certified Safety Engineer in China, Certified Industrial Hygienist (ABIH)
- 10+ years within HSE, including 4+ years in Consumer Health production site, 6 months short time assignment in Germany, 3 years leading HSE Integration projects supporting 5 sites in China, after that move to regional HSE function covering all divisions in Pharmaceutical/ Consumer Health/ Animal Health/Crop science businesses at Bayer. Now Leading HSE Expert Team with subject matter experts and supplier management in the region of APAC.
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Introduction

Traditional programs like Process Safety Management only indirectly protect employees health and life.

More people targeted programs are required !

Programs are called :

- High Risk Work Programs
- Prevention of Serious Injuries or Fatality (SIF)

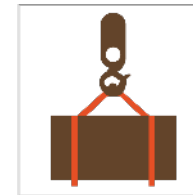
Most of the requirements are legal obligation in Europe / USA



2. Confined space entry



3. Work with hazardous energies



4. Lifting operations



5. Working at height



10. Manual handling



6. High risk contractor and construction work

AGENDA

1 What is SIF

2 Confined Space Entry (CSE)

Working at Heights (WAH)

3 Short Case Study

4 Working with Hazardous Energies (WWHE)

Lifting Operations

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6 High Risk Contractors

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Serious Incident, Impact or Fatality -Definitions

Fatality: a case that has caused the death of one or more individuals.

Serious Injury: life-threatening / life-altering, permanent, work-related injury;

- **Life-threatening:** a case that requires immediate life-preserving rescue action and that, if not applied in an immediate fashion, would likely have resulted in the death of that person. (Usually requires the intervention of emergency response personnel to provide life-saving support).
 - Examples include: significant blood loss, damage to the brain or spinal cord, use of CPR or AED, chest or abdominal trauma affecting vital organs or serious burns.
- **Life-altering:** a case that resulted in a permanent and significant loss or use of a major body part or organ function that permanently changes or disables that person's normal life activity.
 - Examples include: significant head injuries, spinal cord injuries, paralysis, major amputations, catastrophic fractured bones, and serious burns.

SIF Approach – High Level

- Determined the old methods were not accurate
- Treating all events equally to drive the triangle down
- Studies show ~21% of less serious events have SIF potential
- That does not mean we can ignore the lesser events but we must concentrate more closely on those with SIF Potential (the 21%).

15 SIF Categories



Mobile Equipment / Vehicles

Used in regular operation and interaction with pedestrians, structures etc.;



Confined Space Entry

As part of regular maintenance or repair being the cause of entry etc.;



Work with Hazardous Energies

Including moving or rotating machine parts, electricity, pressure, steam systems, line breaking, tasks requiring Lock-out / Tag-out procedures etc.;



Lifting Operations

Including use of cranes, fork lift trucks, lifting beams, block and tackle etc. to physically lift an object;



Working at Height

Use of scaffolds, ladders, MEWPs or fall arrest systems etc.;



High Risk Contractor & Construction Work

Such as excavations, demolitions, removal of contaminated materials etc.;



Exposure to or Release of Hazardous Material

Including APIs, intermediates or other materials that can result in asphyxiation, IDLH conditions or irreversible health effects etc.;



Release of Flammable Liquids or Gases

Including the quantity of release / exposure that must be considered in research, operation or maintenance or repair etc.;



Release of an environmental pollutant

A release of any substance to air, ground or water that may be beyond set limits or which may have a detrimental effect on the environment;



Corrosive Liquid Handling

Used in regular operation, maintenance or repair activities;



Manual Handling

Involving items of considerable weight or highly repetitive movements etc.;



Significant Process Upsets or Instability

During regular operation, maintenance or repair activities;



Unexpected Maintenance

Includes plant and equipment or systems where urgent maintenance is required etc.;



Unexpected Changes

In items of plant and equipment or processes etc.; and



Hot Work

Activities or operations that may generate sufficient heat, sparks or flame to cause a fire Includes welding, flame cutting, soldering, brazing, grinding and other equipment incorporating a flame.

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PSCI Questionnaire – High Hazard General

Worker Protection			
55	Does the facility have a safe work permit system for the following?	Hot Work: Yes No NA Confined Space Work: Yes No NA Energy Isolation or Lock Out/Tag Out: Yes No NA Line Breaking: Yes No NA Work at Height: Yes No NA General Permit Yes No NA Other: Yes No Please describe:	Yes No Comments AUDITOR GUIDANCE: For small size operations, a general permit might be sufficient provided it covers all relevant risks identified at that location. Asses the permit and determine if sufficient.

Confined Space Entry

This is an operation that takes often place although common thinking is that it's only related to entering in small vessels.

Typical activities :

- Manual charging of reactors
- Visual inspection
- Cleaning of equipment
- Inspection and maintenance



Confined Space Entry - Risks

- Asphyxing atmosphere
- Moving parts
(hazardous energies)
- Exposure to chemicals
- Injuries / accident
- Difficulties during rescue



Confined Space Entry - Criteria

- No harmonized definition between companies, authorities, experts
- Usually related to a dimension (volume, length), difficulty of access, potential hazardous atmosphere / energies present
- Need to make sense, be consistent with other programs
- Need to be enforced !



Confined Space Entry – Program Elements

- Definition of Confined Space
- Inventory of Confined Space
- Permit system
- Atmosphere monitoring
- Planning of rescue operations
- Maintenance of equipment (oxygen monitoring, rescue equipment,...)



Work at heights

- All operations that are above ground ; where a fall is possible.
- Access to remote places (inspections, reparations, cleaning, maintenance)
- Access to roofs
- Access to underground or excavated areas



Work at heights - Risks

- Fall
- Fall of objects
- Impact due to moving parts (scissor lift, MEWP)
- Failure of equipment (Lack of maintenance of the ladder, platform,...)



Work at heights - Criteria

- Definition of height
 - 0 meter
 - 1.8 – 2 meters



*Mobile Elevated Work
Platform (MEWP)*

Scissor lift

Work at heights – Program Elements

- Definition
- Risk assessment
- PPE – Fall protection system
- Rescue
- Permit system
- Maintenance program
- Safety perimeter during operation



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Working at Heights

- What is right ?
- What is wrong ?
- What are doing when you see such a situation during the audit ?
- Which documents are you checking after the visit ?
- What will be the finding(s) ?



Confined Space Entry



- What is right ?
- What is wrong ?
- What are doing when you see such a situation during the audit ?
- Which documents are you checking after the visit ?
- What will be the finding(s)?



Working at Heights



- What is right ?
- What is wrong ?
- What are doing when you see such a situation during the audit ?
- Which documents are you checking after the visit ?
- What will be the finding(s)?



Challenging situation

During your visit, no operation like entry in a Confined Space Entry or Working at Heights take place...

What do you do to get an idea of the efficiency of their programs?



Some wrong behaviors...



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PSCI Questionnaire – High Hazard Energies, Electrical, Machine Guarding

Worker Protection			
55	Does the facility have a safe work permit system for the following?	Hot Work: Yes No NA Confined Space Work: Yes No NA Energy Isolation or Lock Out/Tag Out: Yes No NA Line Breaking: Yes No NA Work at Height: Yes No NA General Permit Yes No NA Other: Yes No Please describe:	Yes No Comments AUDITOR GUIDANCE: For small size operations, a general permit might be sufficient provided it covers all relevant risks identified at that location. Asses the permit and determine if sufficient.
56	Has the facility developed and implemented an Electrical Safety Program that includes:	Installation of lockable disconnects interlocks, and emergency stop devices? Yes No Labeling of switches, outlets, breakers, panels, and disconnects? Yes No Designating keep clear areas around electrical equipment for safe work practices? Yes No Electrical cabinets are locked? Yes No Arc Flash Analysis? Yes No	Yes No Comments
57	Has the facility developed and implemented machine guarding procedures (including conveyor systems or other overhead equipment conveying materials (side rails, netting, etc.)) with proper hazard symbols?	Yes No NA Comments:	Yes No NA Comments

Working with Hazardous Energies - Sources

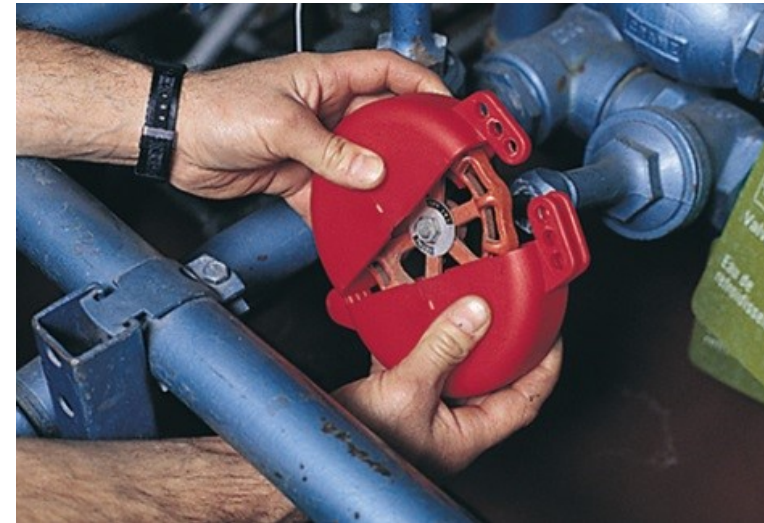
Hazardous energies sources include electrical, mechanical, hydraulic, pneumatic, chemical, thermal, or other sources in machines and equipment can be hazardous to workers.

- Moving or rotating machine parts (Mechanical)
- Pressure or steam systems
- Hazardous materials
(*e.g., chemicals, solvents, toxic gases, asphyxiants gases etc.*)
- Gravity & stored energy
(*e.g., springs, potential energy which would cause equipment to move or rotate, explosion suppression systems, etc.*)
- Electricity
(*mains and stored e.g., capacitors*)
- Pneumatic valves
- Extreme temperatures
- Ionizing and non-ionizing energy sources
(*e.g., nuclear, x-ray, lasers, UV, etc.*)



Working with Hazardous Energies Program Elements

- Definition
- Permit system
- Lock-out tools
- Tag-out tools
- Procedure for special cases
- Possibility of locking out
(can be checked during visit also if there is
no LOTO currently taking place)



Working with hazardous Energies

- Any work done on an equipment that can release energy and harm people
- Working on a packaging line that is switched on by someone else
- Retained energy like compressed air, spring...
- Work on electrical equipment

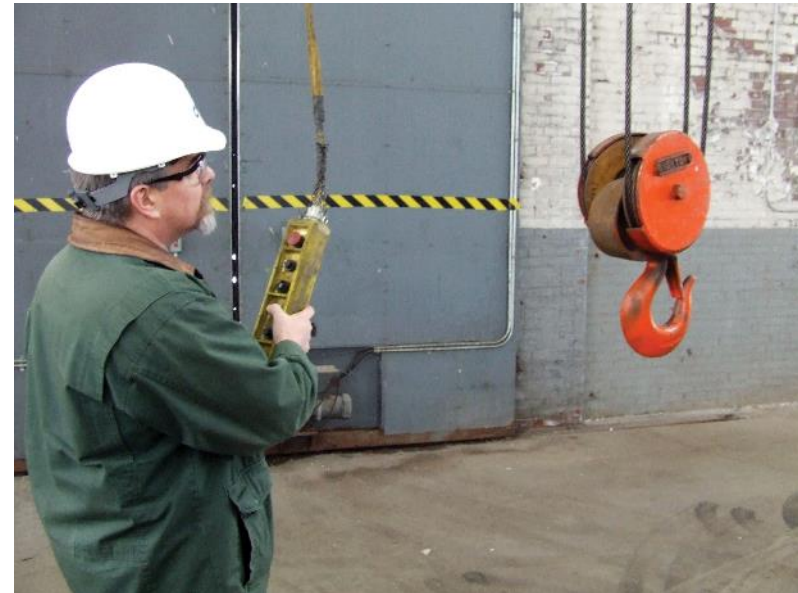


PSCI Questionnaire – Material Handling

59	Are the facility's pedestrian and material handling equipment aisles marked or designated?	Yes No Please explain:	Yes No Comments
60	Has the facility developed and implemented a formal program to provide for the selection and maintenance of Material Handling Equipment?	Yes No Does it include: Operation by trained persons? Yes No Periodic inspection and preventive maintenance by qualified personnel? Yes No If elevated work devices are used is appropriate fall protection equipment in place and is a rescue plan in place? Yes No Please explain:	Yes No Comments
61	Are the facility receiving and/or shipping docks equipped with wheel chocks, dock locking systems or other means of trailer restraint to prevent trailers from moving during loading/unloading?	Yes No Please explain:	Yes No Comments
62	Is product stored overhead in pallet racking stretch wrapped or secured by some means to prevent it from falling?	Yes No Please explain:	Yes No Comments
63	Does the facility have practices to ensure pallet racking is maintained in good condition and regularly inspected (no obvious damages to components – especially uprights – cross beams locked in place, foot plates secured to floor, and capacity posted)?	Yes No Please explain:	Yes No Comments

Lifting Operations

- Moving goods and materials using dedicated equipment
- Lifting of equipment for maintenance or repairs



Lifting Operations - Risks

- Fall of transported goods
- Failure of lifting equipment
- Injury of persons nearby
- Damage to nearby installation
(→ chain reaction)



Lifting Operations– Program Elements

- Task assessment
- Equipment clearly and visibly labeled with appropriate information
- Inspection of the equipment prior to use
- Respect of limitations
- Maintenance program



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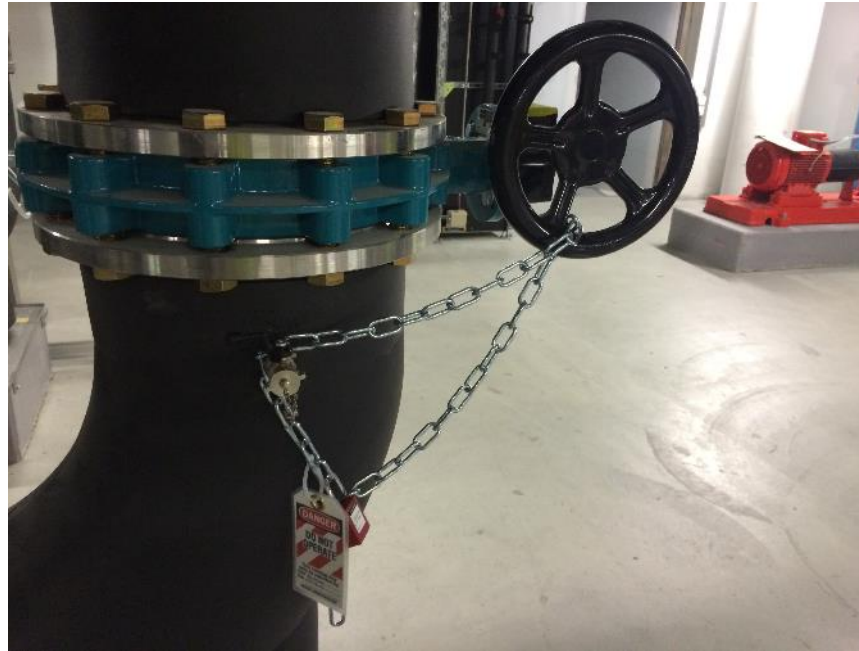
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Is this a proper Lock-out ?



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PSCI Questionnaire – High Risk Contractors

58	Does the facility use any of the following processes for managing risks related to contractor activity onsite?	Contractor pre-approval: Yes No Training/orientation before entry: Yes No Electronic access control: Yes No Drug/alcohol testing: Yes No On-going recurrent safety training: Yes No Mandatory accident reporting: Yes No Other: Yes No If yes, please describe:	Yes No Comments AUDITOR GUIDNACE: Describe how you reviewed each program including details during tour, interviews and document review.
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High Risk Contractors - Purpose

- Works that are not routine (= complex and high risk) are usually realised by specialised, external companies
- Includes Construction workers
- Trend in Europe/USA to have also routine work being done by external companies



High Risk Contractors - Risks

- Activity in itself
- Contractors lacking training / experience
- Not familiar with the facility
- Discrepancy between industry and «local» way of working
- Impact on adjacent / remote operations



High Risk Contractors - Criteria

Contractors performing high risk activities → definition, see ex. SIF activities

Resident contractors vs. one time contractors



High Risk Contractors – Program Elements

- Pre-selection of contractors
- On-boarding orientation
(know the site)
- Need to use the Permit to Work system
- PPE / approved tools
- Checks during works
- Assessment of performance



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Short Case Study



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Short Case Study



Besides usual risks of
getting injured (trips,
falls...) :

Important fire load

Programs

When you review those programs...

- Make sure that the program makes sense
- Make sure that what is written in a SOP is implemented
- Look for proofs of efficiency of those programs
- Look for consistency of those programs
- Look for interdependency

Conclusion

Those High Risk Work or SIF Programs are very important.

**They might be seen as low priority because they impact only one person at a time...
but those operations takes place several time a day therefore *they make a difference* !**



General Safety Questions

HEALTH & SAFETY COMPLIANCE AND RISK MANAGEMENT Self-Assessment Questionnaire					Auditor Verification	
General					Please provide observations, details, comments and any supporting documents	
47	Does the facility have a written Health & Safety policy, procedures, and practices?	Policy: Yes <input type="checkbox"/> No <input type="checkbox"/> Procedures: Yes <input type="checkbox"/> No <input type="checkbox"/> If yes, provide a copy of the policy and list the procedure titles:			Yes <input type="checkbox"/> No <input type="checkbox"/> Comments Link or policy provided: Yes <input type="checkbox"/> No <input type="checkbox"/> List of procedures provided: Yes <input type="checkbox"/> No <input type="checkbox"/>	
48	Does the facility have any documented Health & Safety objectives and targets or goals for performance improvement, including metrics?	Yes <input type="checkbox"/> No <input type="checkbox"/> Please describe:			Yes <input type="checkbox"/> No <input type="checkbox"/> Comments	
49	Indicate the number of significant Health & Safety incidents that occurred at this facility over the past three years? <i>(Significant incidents are defined as: causing serious injuries or fatalities; a fire resulting in damage to process equipment, building, storage areas; physical explosions, fines or violations.)</i> <i>If any of these incidents were or are not being tracked, please indicate this by adding "not tracked" to the appropriate cell</i>		Three years ago	Two years ago	Last year	Yes <input type="checkbox"/> No <input type="checkbox"/> Comments AUDITOR GUIDANCE: Please note that deficiencies in this question do not necessarily result in a finding.
		Serious injuries				
		Fatalities				
		Fire				
		Explosions				
		Fines or violations				
50	Does the facility provide HSE (Health, Safety & Environment) training to employees (full-time, temporary, or contractor)?	New employee orientation and HSE training: Yes <input type="checkbox"/> No <input type="checkbox"/> Periodic refresher training: Yes <input type="checkbox"/> No <input type="checkbox"/> Pre-start up process specific HSE training: Yes <input type="checkbox"/> No <input type="checkbox"/> Employee emergency response action training: Yes <input type="checkbox"/> No <input type="checkbox"/> Hazard Communication, Yes <input type="checkbox"/> No <input type="checkbox"/> Process Safety Management, Yes <input type="checkbox"/> No <input type="checkbox"/> Environmental Practices: Yes <input type="checkbox"/> No <input type="checkbox"/> Comments:			Yes <input type="checkbox"/> No <input type="checkbox"/> Comments AUDITOR GUIDANCE: Review qualification for persons managing API emissions (i.e. knowledge of regulatory requirements and quantification of APIs in treated waste water) Review the business area's written qualifications for persons performing and reviewing environmental calculations and sampling. Ensure that the qualifications address knowledge of the process and applicable regulatory requirements. Are employees responsible for active ingredient wastewater control practices provided suitable and sufficient information, instruction and training to be able to understand the hazards associated with environmental releases of those active ingredients and isolated intermediates?	

General Safety Questions - Continued

51	Does the site have a program for improving safe behaviors?	Yes <input type="checkbox"/> No <input type="checkbox"/> If yes, please describe:	Yes <input type="checkbox"/> No <input type="checkbox"/> Comments
52	Does the facility ensure the provision of safe and potable drinking water and hygienic facilities to all employees?	Yes <input type="checkbox"/> No <input type="checkbox"/> Please explain:	Yes <input type="checkbox"/> No <input type="checkbox"/> Comments AUDITOR GUIDANCE: Water systems that could be impacted by contamination are tested for compounds of concern.
53	Does the company provide adequate sanitary facilities (e.g. clean toilets, possibilities for hand-washing).	Yes <input type="checkbox"/> No <input type="checkbox"/> Please explain:	Yes <input type="checkbox"/> No <input type="checkbox"/> Comments
54	If living accommodation (e.g. dormitories) are provided to employees or contractors, are they safe and clean, and do they meet the relevant basic requirements (e.g. fire protection and emergency)?	Yes <input type="checkbox"/> No <input type="checkbox"/> Please explain: If housing is provided, who has responsibility for maintenance and general HSE? Please explain: Is it ensured that housing for workers and families is not in the vicinity of production areas or with uncontrolled access to operational facility? Yes <input type="checkbox"/> No <input type="checkbox"/>	Yes <input type="checkbox"/> No <input type="checkbox"/> Comments



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About the Secretariat

Carnstone Partners Ltd is an independent management consultancy, specialising in corporate responsibility and sustainability, with a long track record in running industry groups.

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