

Hazards Identification (HAZID)

| Project Name: | | Chai Wan Government Complex and Vehicle Depot | | | | Date: | 25-Aug-14 | | |
|-------------------------|----------------------|---|---|------|---|----------------|--|--|---|
| Project Reference Nos.: | | | | | | Venue: | EMSD Vehicle Depot | | |
| HAZID Zone | | H.1 | | Fire | | Ref. Document: | | | |
| Sr. No. | Guidewords / Hazards | Causes / Activities | Threats and Consequences | S | P | RR | Existing Safeguard | Recommendation | Remark |
| H.1 | Fire | Leakage of gasoline or lubricating oil from vehicles | Fire hazards, personnel injury Limited risk to on-site population as indoor in the future depot. | 2 | A | L | Isolation from source by staff Drip container to collect lubricating oil Spilled oil removed by spillage toolkit Fire extinguisher | No smoking should be allowed near the vehicle maintenance area. Isolated area from vehicle repairing area in future design Oil-interceptor to collect the dip of lube/fuel from vehicle to confine the spread of fuel in future design | Since lubricating oil has a high flash point (about 177°C), it is not easily ignited. No offsite fire hazard of lubricating oil is considered in the study. Heat radiation of 4kW/m ² from 50L petrol pool fire reaches 18.7m which does not impose offsite risk. |
| H.2 | Source of ignition | Spark producing equipment and heat source | Fire hazards, personnel injury | 1 | A | L | No hot works and welding works within the depot. Vehicle battery is isolated before carrying out inspection. | N/A | N/A |
| H.3 | Storage | Improper storage of flammables and combustibles | Fire hazards, personnel injury | 1 | A | L | Sufficient air ventilation is provided at the storage room | N/A | Waste lubricating oil has a high flash point (about 177°C), it is not easily ignited. No offsite fire hazard of lubricating oil is considered in the study. |
| H.4 | Fire | Fire at oil interceptor and drains | Fire hazards, personnel injury | 2 | A | L | No smoking, hot works and welding within the depot Oil in the interceptor to be cleaned up in a regular interval Oil interceptor in an open area | Explosion proof equipment in the oil interceptor zone Sufficient ventilation to avoid accumulation of volatile compound Prohibit smoking in oil interceptor zone | Heat radiation of 4kW/m ² from a typical oil interceptor jet fire reaches 18.4m which does not impose offsite risk. |
| H.5 | Fire | Spillage of waste oil during transfer to storage room | Fire hazards, personnel injury | 1 | A | L | Transfer to waste oil drum with the aid of trolley Spillage toolkit | N/A | Since waste oil has high flash point (about 177°C), it is not easily ignited. No offsite fire hazard of waste oil is considered in the study. |
| H.6 | Fire | Overheating of compressors and ignition of oil vapour | Fire hazards, personnel injury | 3 | B | M | Air compressors installed in a separated room from vehicle maintenance area Sufficient air ventilation is provided in the air compressor room | Regular inspection of performance of air compressors | Compressors are placed indoor. Fire hazard is confined in compressor house and no offsite hazard is considered in the study. |

| QUALITATIVE RISK ASSESSMENT MATRIX (RAM) | | | | | | | | | |
|--|--------------|---|------------------|------------------|----------------------|--|------------------------------|---|--|
| CONSEQUENCES | | | | | Probability (P) | | | | |
| Severity | | People | Assets | Environment | Reputation | A | B | C | D |
| | | | | | | Team does not know of any occurrence in industry | Has occurred in the industry | Has occurred within the operating company | Happens several time per year in operating company |
| 1 | Negligible | Slight injury or health effects | Slight damage | Slight effect | Slight impact | LOW RISK | | | |
| 2 | Marginal | Minor injury or health effects | Minor damage | Minor effect | Minor impact | | | | |
| 3 | Critical | Major injury or health effects | Local damage | Localized effect | Considerable impact | MEDIUM RISK | | | |
| 4 | Severe | Single fatality or permanent disability | Major damage | Major effect | National impact | | HIGH RISK | | |
| 5 | Catastrophic | Multiple fatalities | Extensive damage | Massive effect | International impact | | HIGH RISK | | |

| Hazards Identification (HAZID) | | | | | | | | | | |
|--------------------------------|----------------------|--|--------------------------------|------|---|--------|--|--|--|------|
| Project Name: | | Chai Wan Government Complex and Vehicle Depot | | | | Date: | | 12-Aug-14 | | |
| Project Reference Nos.: | | | | | | Venue: | | HKPF Vehicle Pound | | |
| HAZID Zone | | | H.1 | Fire | | | Ref. Document: | | | |
| Sr. No. | Guidewords / Hazards | Causes / Activities | Threats and Consequences | S | P | RR | Existing Safeguard | Recommendation | Remark | |
| | | | | | | | | | H.1 | Fire |
| H.2 | Source of ignition | Spark producing vehicle and equipment | Fire hazards, personnel injury | 1 | A | L | No spark producing equipment is used. Car battery is isolated before carrying out inspection. | N/A | N/A | |
| H.3 | Storage | Improper Storage and handling of flammables and combustibles | Fire hazards, personnel injury | 1 | A | L | There is no chemical storage in the vehicle pound | N/A | N/A | |
| H.4 | Car crash | Car crash due to brake fail during brake test | Personnel injury | 2 | A | L | Crash barrier Entry restriction to concern area | N/A | Crash barrier prevents the car running off the depot. No offsite hazard is considered in the study. | |
| H.5 | Fire | Fire at oil interceptor and drains | Fire hazards, personnel injury | 3 | A | M | Not available | Explosion proof equipment in the oil interceptor zone Sufficient ventilation to avoid accumulation of volatile compound Prohibit smoking in oil interceptor zone | Heat radiation of 4kW/m ² from a typical oil interceptor jet fire reaches 18.4m which does not impose offsite risk. | |

| QUALITATIVE RISK ASSESSMENT MATRIX (RAM) | | | | | | | | | |
|--|--------------|---|------------------|------------------|----------------------|--|------------------------------|---|--|
| CONSEQUENCES | | | | | Probability (P) | | | | |
| Severity | | People | Assets | Environment | Reputation | A | B | C | D |
| | | | | | | Team does not know of any occurrence in industry | Has occurred in the industry | Has occurred within the operating company | Happens several time per year in operating company |
| 1 | Negligible | Slight injury or health effects | Slight damage | Slight effect | Slight impact | LOW RISK | | | |
| 2 | Marginal | Minor injury or health effects | Minor damage | Minor effect | Minor impact | | | | |
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| | | Hazards Identification (HAZID) | | | | | | | |
|--------------------------------|----------------------|---|---|------|---|---------------|--|--|---|
| Project Name: | | Chai Wan Government Complex and Vehicle Depot | | | | Date: | 26-Aug-14 | | |
| Project Reference Nos.: | | | | | | Venue: | Government Laboratory | | |
| HAZID Zone | | | H.1 | Fire | | | Ref. Document: | | |
| Sr. No. | Guidewords / Hazards | Causes / Activities | Threats and Consequences | | | | Existing Safeguard | Recommendation | Remark |
| | | | | S | P | RR | | | |
| H.1 | Fire | Chemical solvent catch fire due to overheating | Fire hazards, personnel injury Limited risk to on-site population as indoor in the future depot. | 2 | A | L | Well trained / staff Fire extinguishers, fire sprinklers and smoke detectors | N/A | Methanol is a common solvent used in laboratory. Heat radiation of 4kW/m ² from 5L methanol pool fire inside a typical 6 feet fume hood reaches 1.94m which does not impose offsite risk. |
| H.2 | Fugitive emission | Release of toxic gas through air extraction system to the public | Toxic hazards, personal injury | 1 | A | L | Exhaust gas from fume cupboard is treated with activated carbon and scrubber before discharge No highly toxic chemical (e.g. chlorine gas) is handled in the Government Laboratory Exhaust gas emission rate is monitored continuously | N/A | No gas with acute toxicity is used and discharged from the government laboratory. |
| H.3 | Source of ignition | Spark producing equipment | Fire hazards, personnel injury | 2 | A | L | Explosion proof equipment in DG store | N/A | N/A |
| H.4 | Fire | Spilled chemical catches fire | Fire hazards, personnel injury | 2 | A | L | Lack of ignition source in the laboratory Chemical spills removed by absorption mat | N/A | Methanol is a common solvent used in laboratory. Heat radiation of 4kW/m ² from 5L methanol pool fire inside a typical 6 feet fume hood reaches 1.94m which does not impose offsite risk. |
| H.5 | Storage | Improper storage and handling of flammables | Fire hazards, personnel injury | 2 | A | L | Spillage contained within bunded storage room Supervised by safety officer | Adequate ventilation system should be considered for further DG store to avoid accumulation of flammable vapor | Methanol is a common solvent used in laboratory. Heat radiation of 4kW/m ² from 5L methanol pool fire inside a typical 6 feet fume hood reaches 1.94m which does not impose offsite risk. |
| H.6 | Fire | Flammable substances discharged to public mains through sinks/drains and catch fire | Fire hazards, personnel injury, Water Contamination | 1 | A | L | Any unwanted chemicals are stored in chemical waste drums Discharge through drains are monitored regularly Lack of ignition source | N/A | No offsite risk is considered in the study, considering low ignition source in the public main and low concentration of flammable substances diluted by sewage. |
| H.7 | Emergency | Ignition of volatile vapour due to fume cupboard failure | Fire hazards, personnel injury Limited risk to on-site population only in the future depot. | 1 | A | L | Emergency power available Lack of ignition source | N/A | Assuming fume hood can contain 0.5m ³ methane vapor gas which is commonly used as fuel in laboratory, flash fire envelope of 0.5m ³ methane covers 5m inside the building which does not impose offsite risk. |
| H.8 | Chemical container | Rupture of compressed gas cylinders and damaged chemical containers | Cause of fire, personnel injury | 2 | A | L | Gas containers are regularly inspected by licensed contractor. Emergency toolkit to handle chemical spillage. Drills to prepare for emergency situations. Smoking is prohibited in DG store. DG store with explosion proof equipment. Ignition is very unlikely. | Loading and unloading are carried out within the premises | Indoor release of pressurized gas is confined in the government laboratory. No offsite risk is considered in the study. |

| QUALITATIVE RISK ASSESSMENT MATRIX (RAM) | | | | | | | | | |
|--|--------------|---|------------------|------------------|----------------------|--|------------------------------|---|--|
| CONSEQUENCES | | | | | Probability (P) | | | | |
| Severity | | People | Assets | Environment | Reputation | A | B | C | D |
| | | | | | | Team does not know of any occurrence in industry | Has occurred in the industry | Has occurred within the operating company | Happens several time per year in operating company |
| 1 | Negligible | Slight injury or health effects | Slight damage | Slight effect | Slight impact | LOW RISK | | | |
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| 5 | Catastrophic | Multiple fatalities | Extensive damage | Massive effect | International impact | | HIGH RISK | | |

12 August 2014
Our Ref: 9125

Meeting: HAZID Workshop – HKPF Vehicle Depot

Venue: Hong Kong Police Force Vehicle Pound, Hoi Tai Street, Quarry Bay

Date: 12 August, 2014

Time: 9:30 a.m.

Prepared by Gary Chow

Direct Tel: (852) 2241 9865

Email: gac@bmtasia.com.hk

Status Revision 0

Present Chester Chan (ArchSD)
Ko Chun Kit (HKPF)
T.K. Ho (AEC)
Michael Lee (BMT)
Gary Chow (BMT)

| Item | Proceedings | Action |
|------------|--|--------|
| 1.0 | Introduction | |
| 1.1 | Michael explained to the Project Team that the purpose of the workshop was to understand the normal operation of the existing HKPF vehicle pound and identify potential hazards which could induce off-site risks. | Noted |
| 2.0 | Site Walk | |
| 2.1 | The Representative of HKPF led a site walk and introduced the function of the vehicle pound was to examine defective vehicles through inspection on the street by HKPF and damaged vehicles from car accidents. | Noted |
| 2.2 | The Project Team visited the areas of vehicle inspection for both defective and damaged car. | Noted |
| 3.0 | Hazard Identification | |
| 3.1 | The following potential hazards and the corresponding handling procedures were identified through interviews by BMT with the maintenance force: <ul style="list-style-type: none"> Leakage of gasoline will be isolated from source by blocking the pipework Leakage of lubricant oil will be of small amount and absorbed by absorbent pads for disposal Possible spark from vehicle battery will be eliminated by cutting off cables before car examination Cutting disc / hot tools, which may generate spark, will not be used | Noted |

MINUTES OF MEETING

(continuation sheet)

Meeting: HAZID Workshop – HKPF Vehicle Depot

Venue: Hong Kong Police Force Vehicle Pound, Hoi Tai Street, Quarry Bay

Date: 12 August 2014

| Item | Proceedings | Action |
|------------|---|--------|
| 3.2 | There is no dangerous goods store in the vehicle pound as confirmed by HKPF. | Noted |
| 3.3 | There is no oil interceptor in the existing vehicle pound. | Noted |
| 3.4 | Same as petrol vehicles, batteries from electric powered / hybrid car will be isolated before conducting inspection to avoid sparks. | |
| 4.0 | Conclusion | |
| 4.1 | Discussion was carried out amongst the Project Team and BMT suggested few possible improvements for the future vehicle depot: <ul style="list-style-type: none"> More signage to suggest a non-smoking practice within vehicle maintenance area Standby fire extinguisher to be placed near vehicle maintenance area so fire could be put out immediately Sufficient air ventilation should be provided to avoid vapour cloud formation within enclosed area | Noted |
| 5.0 | Adjournment | |
| 5.1 | The workshop was finished at 11:00 a.m. | Noted |
| 6.0 | Post Meeting Notes | |
| 6.1 | HAZID worksheet has been prepared as a record and enclosed with this minutes. | Noted |

| | | Hazards Identification (HAZID) | | | | | | | | | | | | | | | | |
|--------------------------------|----------------------|---|---|------|---|----|---|---|----|---|---|---------------|---|--------------------|----|--------------------|--|---|
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| Project Reference Nos.: | | | | | | | | | | | | Venue: | | HKPF Vehicle Pound | | | | |
| HAZID Zone | | | H.1 | Fire | | | | | | | | | | | | Ref. Document: | | |
| Sr. No. | Guidewords / Hazards | Causes / Activities | Threats and Consequences | P | | | E | | | A | | | R | | | Existing Safeguard | Recommendation | |
| | | | | S | P | RR | S | P | RR | S | P | RR | S | P | RR | | | |
| H.1 | Fire | Leakage of gasoline from damaged vehicles | Fire hazards, personnel injury Limited risk to on-site population as indoor in the future depot. | 3 | A | M | | | | | | | | | | | Isolation from source by maintenance force Fire extinguisher | No smoking should be allowed near the vehicle maintenance area. Isolated area from Vehicle Examination Area in future design Drain with Oil-interceptor – to collect the dip of lube/fuel from vehicle to confine the spread of fuel in future design |
| H.2 | Source of ignition | Spark producing vehicle and equipment | Fire hazards, personnel injury | 1 | A | L | | | | | | | | | | | No spark producing equipment is used. Car battery is isolated before carrying out inspection. | NA |

MINUTES OF MEETING

(continuation sheet)

Meeting: HAZID Workshop – HKPF Vehicle Depot

Venue: Hong Kong Police Force Vehicle Pound, Hoi Tai Street, Quarry Bay

Date: 12 August 2014

| Hazards Identification (HAZID) | | | | | | | | | | | | | | | | | |
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| Project Name: | | Chai Wan Government Complex and Vehicle Depot | | | | | | | | | | | | Date: | 12-Aug-14 | | |
| Project Reference Nos.: | | | | | | | | | | | | | | Venue: | HKPF Vehicle Pound | | |
| HAZID Zone | | | H.1 | Fire | | | | | | | | | | | | Ref. Document: | |
| Sr. No. | Guidewords / Hazards | Causes / Activities | Threats and Consequences | P | | | E | | | A | | | R | | | Existing Safeguard | Recommendation |
| | | | | S | P | RR | S | P | RR | S | P | RR | S | P | RR | | |
| H.3 | Storage | Improper Storage and handling of flammables and combustibles | Fire hazards, personnel injury | 1 | A | L | | | | | | | | | | There is no chemical storage in the vehicle pound | NA |
| H.4 | Car crash | Car crash due to brake fail during brake test | Personnel injury | 2 | A | L | | | | | | | | | | Crash barrier Entry restriction to concern area | NA |
| H.5 | Fire | Fire at oil interceptor and drains | Fire hazards, personnel injury | 3 | A | M | | | | | | | | | | Not available | Explosion proof equipment in the oil interceptor zone Sufficient ventilation to avoid accumulation of |

MINUTES OF MEETING


(continuation sheet)

Meeting: HAZID Workshop – HKPF Vehicle Depot

Venue: Hong Kong Police Force Vehicle Pound, Hoi Tai Street, Quarry Bay

Date: 12 August 2014

| Hazards Identification (HAZID) | | | | | | | | | | | | | | | | | |
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| Project Reference Nos.: | | | | | | | | | | | | Venue: | | HKPF Vehicle Pound | | | |
| HAZID Zone | | | H.1 | Fire | | | | | | | | | | | | Ref. Document: | |
| Sr. No. | Guidewords / Hazards | Causes / Activities | Threats and Consequences | P | | | E | | | A | | | R | | | Existing Safeguard | Recommendation |
| | | | | S | P | RR | S | P | RR | S | P | RR | S | P | RR | | |
| | | | | | | | | | | | | | | | | | volatile compound Prohibit smoking in oil interceptor zone |

 Note: Assets, Environment and Reputation are not applicable

| QUALITATIVE RISK ASSESSMENT MATRIX (RAM) | | | | | | | | | |
|--|--------------|---|------------------|------------------|----------------------|--|------------------------------|---|--|
| CONSEQUENCES | | | | | | Probability (P) | | | |
| | | | | | | A | B | C | D |
| Severity | | People | Assets | Environment | Reputation | Team does not know of any occurrence in industry | Has occurred in the industry | Has occurred within the operating company | Happens several time per year in operating company |
| 1 | Negligible | Slight injury or health effects | Slight damage | Slight effect | Slight impact | LOW RISK | | | |
| 2 | Marginal | Minor injury or health effects | Minor damage | Minor effect | Minor impact | | | | |
| 3 | Critical | Major injury or health effects | Local damage | Localized effect | Considerable impact | MEDIUM RISK | | | |
| 4 | Severe | Single fatality or permanent disability | Major damage | Major effect | National impact | | | | |
| 5 | Catastrophic | Multiple fatalities | Extensive damage | Massive effect | International impact | HIGH RISK | | | |

25 August 2014
Our Ref: 9125

Meeting: HAZID Workshop – HKPF Vehicle Depot

Venue: EMSD Vehicle Depot, Sheung On Street, Chai Wan

Date: 25 August, 2014

Time: 9:30 a.m.

Prepared by Gary Chow

Direct Tel: (852) 2241 9865

Email: gac@bmtasia.com.hk

Status Revision 0

Present Chester Chan (ArchSD)
Ko Chun Kit (HKPF)
Wong Kai Chung (EMSD)
Yung Yin Hing, Ricky (EMSD)
T.K. Ho (AEC)
Viann Lau (AEC)
Michael Lee (BMT)
Gary Chow (BMT)

| Item | Proceedings | Action |
|------------|--|--------|
| 1.0 | Introduction | |
| 1.1 | Michael briefly introduced the background the Project and the approach of the workshop. He explained to the Project Team that the purpose of the workshop was to understand the normal operation of the existing EMSD vehicle depot and identify potential hazards which could induce off-site risks. | Noted |
| 1.2 | T.K.added that a Hazard to Life Assessment is required for the Project since the location of the proposed building is in the vicinity of oil terminal and petrol cum LPG filling stations. | Noted |
| 1.3 | Ricky presented to the Project team that the routine activities of the existing depot involved mechanical repairing and general maintenance of government vehicles. He said the depot had been operating for about 3 months and currently serves around 700 vehicles per month. There would be no LPG and electrical vehicles repaired in the depot due to site constraints. | Noted |
| 1.4 | Ricky further described that waste oil, lubricating oil, refrigerants and vehicle batteries were being stored in the depot | Noted |
| 1.5 | Ricky responded to T.K. that an oil interceptor was installed to collect fugitive oil flowing into storm drains inside the depot. | Noted |
| 2.0 | Site Walk | |
| 2.1 | Ricky led a site walk and introduced the function at different area of the vehicle depot. | Noted |

Distribution: Original in Project File

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MINUTES OF MEETING

(continuation sheet)

Meeting: HAZID Workshop – EMSD Vehicle Depot **Venue:** EMSD Vehicle Depot, Sheung On Street, Chai Wan
Date: 25 August 2014

| Item | Proceedings | Action |
|------------|---|--------|
| 2.2 | The Project Team visited the vehicle maintenance area, air compressor room, waste oil and lubricant oil storage area, vehicle battery storage area and the location of the oil interceptor. | Noted |
| 2.3 | The oil interceptor was scheduled to be cleaned up by sub-contractor after a year of operation. | Noted |
| 2.4 | No smoking was allowed within the depot. | Noted |
| 3.0 | Hazard Identification | |
| 3.1 | The following potential hazards and the corresponding handling procedures were identified through site walk and interview with EMSD staff: <ul style="list-style-type: none"> drained lubricating oil from repairing vehicles was collected by drip container and later transferred to designated waste oil storage room; leakage of lubricant oil will be of small amount and absorbed by absorbent pads for disposal; any spilled oil would be cleaned up by spilling tool kit. And there were standard procedures for the maintenance team to remove spilled oil; possible fire from vehicle battery will be eliminated by removing/disconnect the vehicle battery before car maintenance; fire from oil interceptor was very unlikely due to lack of ignition sources within the depot; and accumulation of combustible vapour cloud within the storage room would be of very low chance as there was no storage of volatile chemical compound and sufficient ventilation was provided. | Noted |
| 3.2 | There was no hot work and welding works in the depot. | Noted |
| 3.3 | Maintenance of fire service provisions at the depot follow statutory regulations. | Noted |
| 3.4 | Ricky commended there was no known fire incident happened in the existing depot or similar depot with similar functions. | Noted |
| 4.0 | Conclusion | |
| 4.1 | Michael concludes the workshop with the Project Team. Based on the current operational activities, the Project Team agreed the vehicle depot would not cause off-site risk | Noted |
| 5.0 | Adjournment | |
| 5.1 | The workshop was finished at 10:30 a.m. | Noted |
| 6.0 | Post Meeting Notes | |
| 6.1 | HAZID worksheet has been prepared and enclosed as a record. | Noted |

Distribution: Original in Project File

Page: 2 of 2

| Hazards Identification (HAZID) | | | | | | | | | | | | | | | | | |
|---------------------------------------|----------------------|--|---|------|---|----|---|---|----|---|---|----|---------------|---|--------------------|---|--|
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| Project Reference Nos.: | | | | | | | | | | | | | Venue: | | EMSD Vehicle Depot | | |
| HAZID Zone | | | H.1 | Fire | | | | | | | | | | | | Ref. Document: | |
| Sr. No. | Guidewords / Hazards | Causes / Activities | Threats and Consequences | P | | | E | | | A | | | R | | | Existing Safeguard | Recommendation |
| | | | | S | P | RR | S | P | RR | S | P | RR | S | P | RR | | |
| H.1 | Fire | Leakage of gasoline or lubricating oil from vehicles | Fire hazards, personnel injury Limited risk to on-site population as indoor in the future depot. | 2 | A | L | | | | | | | | | | Isolation from source by staff Drip container to collect lubricating oil Spilled oil removed by spillage toolkit Fire extinguisher | No smoking should be allowed near the vehicle maintenance area. Isolated area from vehicle repairing area in future design Oil-interceptor to collect the dip of lube/fuel from vehicle to confine the spread of fuel in future design |
| H.2 | Source of ignition | Spark producing equipment and heat source | Fire hazards, personnel injury | 1 | A | L | | | | | | | | | | No hot works and welding works within the depot. Vehicle battery is isolated before carrying out inspection. | NA |

MINUTES OF MEETING

(continuation sheet)

Meeting: HAZID Workshop – EMSD Vehicle Depot

Venue: EMSD Vehicle Depot, Sheung On Street, Chai Wan

Date: 25 August 2014

| Hazards Identification (HAZID) | | | | | | | | | | | | | | | | | |
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| Sr. No. | Guidewords / Hazards | Causes / Activities | Threats and Consequences | P | | | E | | | A | | | R | | | Existing Safeguard | Recommendation |
| | | | | S | P | RR | S | P | RR | S | P | RR | S | P | RR | | |
| H.3 | Storage | Improper storage of flammables and combustibles | Fire hazards, personnel injury | 1 | A | L | | | | | | | | | | Sufficient air ventilation is provided at the storage room | NA |
| H.4 | Fire | Fire at oil interceptor and drains | Fire hazards, personnel injury | 2 | A | L | | | | | | | | | | No smoking, hot works and welding within the depot Oil in the interceptor to be cleaned up in a regular interval Oil interceptor in an open area | Explosion proof equipment in the oil interceptor zone Sufficient ventilation to avoid accumulation of volatile compound Prohibit smoking in oil interceptor zone |

MINUTES OF MEETING


(continuation sheet)

Meeting: HAZID Workshop – EMSD Vehicle Depot

Venue: EMSD Vehicle Depot, Sheung On Street, Chai Wan

Date: 25 August 2014

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| | | | | S | P | RR | S | P | RR | S | P | RR | S | P | RR | | |
| H.5 | Fire | Spillage of waste oil during transfer to storage room | Fire hazards, personnel injury | 1 | A | L | | | | | | | | | | Transfer to waste oil drum with the aid of trolley Spillage toolkit | NA |
| H.6 | Fire | Overheating of compressors and ignition of oil vapour | Fire hazards, personnel injury | 3 | B | M | | | | | | | | | | Air compressors installed in a separated room from vehicle maintenance area Sufficient air ventilation is provided in the air compressor room | Regular inspection of performance of air compressors |

 Note: Assets, Environment and Reputation are not applicable

| QUALITATIVE RISK ASSESSMENT MATRIX (RAM) | | | | | | | | | |
|--|--------------|---|------------------|------------------|----------------------|--|------------------------------|---|--|
| CONSEQUENCES | | | | | | Probability (P) | | | |
| | | | | | | A | B | C | D |
| Severity | | People | Assets | Environment | Reputation | Team does not know of any occurrence in industry | Has occurred in the industry | Has occurred within the operating company | Happens several time per year in operating company |
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| 2 | Marginal | Minor injury or health effects | Minor damage | Minor effect | Minor impact | | | | |
| 3 | Critical | Major injury or health effects | Local damage | Localized effect | Considerable impact | MEDIUM RISK | | | |
| 4 | Severe | Single fatality or permanent disability | Major damage | Major effect | National impact | | | | |
| 5 | Catastrophic | Multiple fatalities | Extensive damage | Massive effect | International impact | HIGH RISK | | | |

27 August 2014
Our Ref: 9125

Meeting: HAZID Workshop – Government Laboratory

Venue: Government Laboratory, 7/F, Ho Man Tin Government Offices

Date: 26 August, 2014

Time: 2:30 p.m.

Prepared by Gary Chow

Direct Tel: (852) 2241 9865

Email: gac@bmtasia.com.hk

Status Revision 0

Present Chester Chan (ArchSD)
Ko Chun Kit (HKPF)
Tang Po On (GL)
Viann Lau (AEC)
Michael Lee (BMT)
Gary Chow (BMT)

| Item | Proceedings | Action |
|------------|--|--------|
| 1.0 | Introduction | |
| 1.1 | Michael explained to the Project Team that the purpose of the workshop was to understand the normal operation of the existing Government Laboratory and identify potential hazards which could induce off-site risks. | Noted |
| 1.2 | Michael briefed to the Project Team on the rundown of workshop and the technique of HAZID. | Noted |
| 1.3 | The Representative of the Government Laboratory (GL), Mr. Tang, introduced the main purpose of GL at the proposed site was to provide chemical testing service for other government departments. The testing handled including environmental, food, medical / Chinese Medicine and commercial products. | Noted |
| 1.4 | The chemical tests in the GL mainly involved wet chemistry (sample preparation, digestion, solvent extraction) and analytical chemistry using (GC, LC, IC & ICP), as further explained by Mr. Tang | Noted |
| 2.0 | Site Walk | |
| 2.1 | Mr. Tang led a site walk in the laboratory and introduced the function of different sections, which included acid digestion and trace organics etc. | Noted |
| 2.2 | Compressed gas cylinders such as helium and hydrogen were stored in cupboards that equipped with flow regulators. Gas cylinders were normally stored in pairs, one for duty and one for standby. The flowrate of gases were normally in ml/min. Hydrogen and nitrogen generators were also used in analytical equipment. Those generators are equipped with gas detector and auto-shutoff device to | Noted |

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MINUTES OF MEETING

(continuation sheet)

Meeting: HAZID Workshop – Government Laboratory

Venue: Government Laboratory, 7F, Ho Man Tin Governmental Offices

Date: 26 August 2014

| Item | Proceedings | Action |
|------------|---|--------|
| | prevent leakage in abnormal conditions. | |
| 2.3 | All extracted gas from the fumehood within the laboratory was treated with activated carbon and scrubber before release to open air. The performance of activated carbon and scrubber were monitoring of emission concentration from the exhaust gas according to ISO9000/ISO14000 management system. | Noted |
| 2.4 | Chemical wastes were stored in drums under fumehood and collected by licenced sub-contractor every week. | Noted |
| 2.5 | The Project team visited the Dangerous Goods store in the basement of the building. | Noted |
| 3.0 | Hazard Identification | |
| 3.1 | The following potential hazards were discussed in the workshop: <ul style="list-style-type: none"> • Heating plates were used in the laboratory, open flame was not used. • No toxic chemicals with acute fatality effect were handled by the laboratory. • There were standard procedures in the laboratory to handle chemical spillage. The Laboratory Safety Officer would take part in the coordination of spillage handling. The spilled chemicals would be cleaned up by absorption mats and disposed of as chemical waste. • In case of electricity failure, fumehood operation would be maintained by emergency power. • Chemicals discharged through drains would be very unlikely according to the standard procedures to handle chemical waste and there were regular monitoring of discharge from drains. • Flammable material storage room in the DG store is banded. Any spillage would be contained within the storage room. • Sparks within the DG store was eliminated by the installation of explosion proof equipment. • The compressed gas cylinder is equipped with protection cap and regular inspection. | Noted |
| 3.2 | Mr. Tang did not know any occurrence of fire within the Government Laboratory before and did not recall any incidents in the Government Laboratory that had caused fatality to off-site population. | Noted |
| 3.3 | There had not been incident with injuries involving spillage during transportation of chemical in the Government Laboratory as commented by Mr. Tang. | Noted |
| 3.4 | Drills on fire and chemical spillage are carried out in the regular interval to increase the safety awareness amongst staff according to ISO9000 management system. | Noted |
| 3.5 | Accident in the Government Laboratory usually involved broken glass and general office injuries only. | Noted |

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MINUTES OF MEETING

(continuation sheet)

Meeting: HAZID Workshop – Government Laboratory**Venue:** Government Laboratory, 7F, Ho Man Tin Governmental Offices**Date:** 26 August 2014

| Item | Proceedings | Action |
|------------|---|--------|
| 3.6 | Unloading of chemical containers and gas cylinders were carried out within the basement that off-site population was not affected. Design of unloading bay of future government complex should follow similar approach. | ArchSD |
| 4.0 | Conclusion | |
| 4.1 | Michael concluded the meeting by summarizing the findings in the HAZID workshop. The Project Team agreed the operation of the Government Laboratory would not cause off-site risk. | Noted |
| 5.0 | Adjournment | |
| 5.1 | The workshop was finished at 4:00 p.m. | Noted |
| 6.0 | Post Meeting Notes | |
| 6.1 | HAZID worksheet has been prepared as a record and enclosed with this meeting minutes. | Noted |

| | | Hazards Identification (HAZID) | | | | | | | | | | | | | | | |
|--------------------------------|----------------------|--|---|------|---|----|---|---|----|---|---|---------------|---|-----------------------|----|---|----------------|
| Project Name: | | Chai Wan Government Complex and Vehicle Depot | | | | | | | | | | Date: | | 26-Aug-14 | | | |
| Project Reference Nos.: | | | | | | | | | | | | Venue: | | Government Laboratory | | | |
| HAZID Zone | | | H.1 | Fire | | | | | | | | | | | | Ref. Document: | |
| Sr. No. | Guidewords / Hazards | Causes / Activities | Threats and Consequences | P | | | E | | | A | | | R | | | Existing Safeguard | Recommendation |
| | | | | S | P | RR | S | P | RR | S | P | RR | S | P | RR | | |
| H.1 | Fire | Chemical solvent catch fire due to overheating | Fire hazards, personnel injury Limited risk to on-site population as indoor in the future depot. | 2 | A | L | | | | | | | | | | Well trained / staff Fire extinguishers, fire sprinklers and smoke detectors | NA |
| H.2 | Fugitive emission | Release of toxic gas through air extraction system to the public | Toxic hazards, personal injury | 1 | A | L | 1 | A | L | | | | | | | Exhaust gas from fume cupboard is treated with activated carbon and scrubber before discharge No highly toxic chemical (e.g. chlorine gas) is handled in the Government Laboratory Exhaust gas emission | NA |

MINUTES OF MEETING

(continuation sheet)

Meeting: HAZID Workshop – Government Laboratory

Venue: Government Laboratory, 7F, Ho Man Tin Governmental Offices

Date: 26 August 2014

| Hazards Identification (HAZID) | | | | | | | | | | | | | | | | | |
|---------------------------------------|----------------------|---|--------------------------------|------|---|----|---|---|----|---|---|----|---------------|-----------------------|----|---------------------------------------|----------------|
| Project Name: | | Chai Wan Government Complex and Vehicle Depot | | | | | | | | | | | Date: | 26-Aug-14 | | | |
| Project Reference Nos.: | | | | | | | | | | | | | Venue: | Government Laboratory | | | |
| HAZID Zone | | | H.1 | Fire | | | | | | | | | | | | Ref. Document: | |
| Sr. No. | Guidewords / Hazards | Causes / Activities | Threats and Consequences | P | | | E | | | A | | | R | | | Existing Safeguard | Recommendation |
| | | | | S | P | RR | S | P | RR | S | P | RR | S | P | RR | | |
| | | | | | | L | | | L | | | | | | | rate is monitored continuously | |
| H.3 | Source of ignition | Spark producing equipment | Fire hazards, personnel injury | 2 | A | L | | | | | | | | | | Explosion proof equipment in DG store | NA |

MINUTES OF MEETING

(continuation sheet)

Meeting: HAZID Workshop – Government Laboratory

Venue: Government Laboratory, 7F, Ho Man Tin Governmental Offices

Date: 26 August 2014

| Hazards Identification (HAZID) | | | | | | | | | | | | | | | | | |
|---------------------------------------|----------------------|---|---|------|---|----|---|---|----|---|---|----|---------------|-----------------------|----|--|--|
| Project Name: | | Chai Wan Government Complex and Vehicle Depot | | | | | | | | | | | Date: | 26-Aug-14 | | | |
| Project Reference Nos.: | | | | | | | | | | | | | Venue: | Government Laboratory | | | |
| HAZID Zone | | | H.1 | Fire | | | | | | | | | | | | Ref. Document: | |
| Sr. No. | Guidewords / Hazards | Causes / Activities | Threats and Consequences | P | | | E | | | A | | | R | | | Existing Safeguard | Recommendation |
| | | | | S | P | RR | S | P | RR | S | P | RR | S | P | RR | | |
| H4. | Fire | Spilled chemical catches fire | Fire hazards, personnel injury | 2 | A | L | | | | | | | | | | Lack of ignition source in the laboratory Chemical spills removed by absorption mat | NA |
| H.5 | Storage | Improper storage and handling of flammables | Fire hazards, personnel injury | 2 | A | L | | | | | | | | | | Spillage contained within bunded storage room Supervised by safety officer | Adequate ventilation system should be considered for further DG store to avoid accumulation of flammable vapor |
| H.6 | Fire | Flammable substances discharged to public mains through | Fire hazards, personnel injury, Water Contamination | 1 | A | L | 1 | A | L | | | | | | | Any unwanted chemicals are stored in chemical waste drums | NA |

MINUTES OF MEETING

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Meeting: HAZID Workshop – Government Laboratory

Venue: Government Laboratory, 7F, Ho Man Tin Governmental Offices

Date: 26 August 2014

| Hazards Identification (HAZID) | | | | | | | | | | | | | | | | | |
|---------------------------------------|----------------------|---|--|------|---|----|---|---|----|---|---|---------------|---|-----------------------|--|---|----------------|
| Project Name: | | Chai Wan Government Complex and Vehicle Depot | | | | | | | | | | Date: | | 26-Aug-14 | | | |
| Project Reference Nos.: | | | | | | | | | | | | Venue: | | Government Laboratory | | | |
| HAZID Zone | | | H.1 | Fire | | | | | | | | | | | | Ref. Document: | |
| Sr. No. | Guidewords / Hazards | Causes / Activities | Threats and Consequences | P | | | E | | | A | | | R | | | Existing Safeguard | Recommendation |
| | | | | S | P | RR | S | P | RR | S | P | RR | S | P | RR | | |
| | | sinks/drains and catch fire | | | | | | | | | | | | | Discharge through drains are monitored regularly Lack of ignition source | | |
| H.7 | Emergency | Ignition of volatile vapour due to fume cupboard failure | Fire hazards, personnel injury Limited risk to on-site population only in the future depot. | 1 | A | L | | | | | | | | | Emergency power available Lack of ignition source | NA | |
| H.8 | Chemical container | Rupture of compressed gas cylinders and damaged chemical containers | Cause of fire, personnel injury | 2 | A | L | | | | | | | | | Gas containers are regularly inspected by licensed contractor. Emergency toolkit to handle chemical | Loading and unloading are carried out within the premises | |

MINUTES OF MEETING


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Meeting: HAZID Workshop – Government Laboratory

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Date: 26 August 2014

| Hazards Identification (HAZID) | | | | | | | | | | | | | | | | | | |
|---------------------------------------|----------------------|---|--------------------------|------|---|----|---|---|----|---|---|---------------|---|-----------------------|----|--------------------|---|--|
| Project Name: | | Chai Wan Government Complex and Vehicle Depot | | | | | | | | | | Date: | | 26-Aug-14 | | | | |
| Project Reference Nos.: | | | | | | | | | | | | Venue: | | Government Laboratory | | | | |
| HAZID Zone | | | H.1 | Fire | | | | | | | | | | | | Ref. Document: | | |
| Sr. No. | Guidewords / Hazards | Causes / Activities | Threats and Consequences | P | | | E | | | A | | | R | | | Existing Safeguard | Recommendation | |
| | | | | S | P | RR | S | P | RR | S | P | RR | S | P | RR | | | |
| | | | | | | | | | | | | | | | | | spillage. Drills to prepare for emergency situations. Smoking is prohibited in DG store. DG store with explosion proof equipment. Ignition is very unlikely. | |

 Note: Assets, Environment and Reputation are not applicable

| QUALITATIVE RISK ASSESSMENT MATRIX (RAM) | | | | | | | | | |
|--|--------------|---|------------------|------------------|----------------------|--|------------------------------|---|--|
| CONSEQUENCES | | | | | | Probability (P) | | | |
| | | | | | | A | B | C | D |
| Severity | | People | Assets | Environment | Reputation | Team does not know of any occurrence in industry | Has occurred in the industry | Has occurred within the operating company | Happens several time per year in operating company |
| 1 | Negligible | Slight injury or health effects | Slight damage | Slight effect | Slight impact | LOW RISK | | | |
| 2 | Marginal | Minor injury or health effects | Minor damage | Minor effect | Minor impact | | | | |
| 3 | Critical | Major injury or health effects | Local damage | Localized effect | Considerable impact | MEDIUM RISK | | | |
| 4 | Severe | Single fatality or permanent disability | Major damage | Major effect | National impact | | | | |
| 5 | Catastrophic | Multiple fatalities | Extensive damage | Massive effect | International impact | HIGH RISK | | | |