Chapter 5

Impact prevention and safety solution measures.

5.1 Assessment and analysis of incidental hazards from solar power farm operation

According to the assessment and analysis of incident hazards from the operation of the Solar Power (Korat 2) Co., Ltd. such as the storing, transportation and utilization of raw materials, fuel, chemicals and equipment as well as the operational procedure of the photovoltaic solar power farm, it was found that there will be a very short impact period during the construction phase and there will be no incidental hazards from the plant operation, including impacts on occupational hygiene and operator safety.

5.2 Control, prevention and/or solution measures for reducing impact

After the assessment and analysis on possible hazards, which could result in fatalities, disabilities; fires, explosions, chemical leakages, etc. Control, prevention and/or solutions and measures to reduce impacts and fire prevention as well as emergency plans for occupational hygiene and accident prevention have been developed as follows:

5.2.1 Occupational hygiene and operator safety during the construction phase:

Physical Agents

Physical environment which may result in physical hazards to the operator through any kind of incorrect or irregular exposure or contact to physical agents such as noise, lighting, vibration, abnormal temperatures, abnormal pressures, radiation and any other effects includes:

Fugitive Dust can occur during construction, especially from soil works. This can be controlled by spraying water on the construction area. Information from U.S.EPA 1977 shows that spraying water on the ground twice a day can reduce dust in the air from said activities by 50%. As the construction area is substantial and outdoors polluting emissions from machinery or construction equipment is minor. There is little impact on people or the surrounding area. Aside from this, dust from construction equipment transportation is reduced by covering trucks with canvas or plastic material. The construction area is well-organized, and any waste produced is sorted into hazardous and non-hazardous material and disposed of in a responsible manner to ensure the health and safety of all employees; this includes transporting soil out of construction areas and, in the case transport are not available, providing materials to contain and cover these soils.

Noise: According to the Ministry of Interior's regulation (announcement from the Revolutionary Council No. 103), workers cannot work with noise levels exceeding 91 dB (A) for more than 7 hours. If the noise from foundation pile driving is higher than 91 dB (A); the

contractor must follow the regulation worker rotation in that area and ensure that the workers do not work for more than the indicated duration. Hearing protection is provided in the forms of ear plugs or ear muffs, which reduces the noise level by at least 15 to 25 dB (A) respectively to minimize the impact. The foundation pile driving takes approximately 1 month to complete, and by strictly following the regulations, any impact will be minimal, with no effect to workers' hearing efficiency, communication, mental health or occupational efficiency.

Heat Stress: There is no heat source during construction. Exposure to heat can only come from working outdoors. Shade shelters have been provided for heat relief. Workers who are required to work outdoors must not be overweight and they must not consume alcohol in the timeframe of 24 hours prior to starting work. Furthermore, they must not show signs of a hangover, suffer from hydropenia, consume caffeinated drinks, and they must be well-rested.

The project management must allow workers to get accustomed to working under heat exposure for their bodies to be adapted to the heat, a process that normally takes 6-7 days; however, continuous absence from heat exposure can reduce their tolerance to heat. Workers who are not accustomed to working with heat will be assigned 20% of the workload on the first day, and their workload will increase by 20% each day until the fifth day, when they should be able to handle 100% of the workload. Workers who are familiar with working with heat but have not been exposed to heat for more than 9 days onwards will be assigned 50% of the workload on the first day, 60% on the second day, 80% on the third day and 100% on the fourth day.

Furthermore, there are several ways to manage working hours, such as working in shifts, employing additional workers, and allowing more breaks, providing drinking water, rest areas, bathrooms, and ventilated clothing to the employees. Training sessions will be conducted on the dangers of working with heat, and prevention and treatment of heat cramp, heat syncope and heat stroke.

Vibration: There are no sources of vibration during construction.

Radiation: There are no sources of radiation during construction.

Construction activities require both skilled and general laborers. These laborers are at risk of work accidents. To prevent hazards from construction and construction materials falling during transportation, it is therefore necessary to demarcate dangerous zones and prohibit access to these zones. Prevention of materials falling will be done by using covers or nets, and posting warning signage. Moreover, construction materials must not be placed where they can obstruct other work.

Workers who work in dangerous areas such as places where heavy objects are moved must wear personal safety equipments such as safety helmets, iron tip shoes and ear plugs. The construction company will be responsible for providing their own workers with all

safety gear as well as instructing, supervising and ensuring that all employees use the safety equipments.

In addition, the project management has put safe work obligations in our contractor agreements; these obligations contain regulations and recommended procedures in order to prevent personal and asset damage.

According to all above measures therefore, it is expected that any incidental impact or occupational health hazards will be minimized.

Chemical Agents

Presently, there are over 50,000 different types of chemicals available for industrial use, including hazardous chemicals such as toxic substances, flammable materials, explosive materials, corrosive materials, and radioactive materials, all of which are potentially dangerous. None of these chemicals are present during our construction.

Different types of chemicals in the occupational environment exist in the form of solid particles such as dusts, fibers, and fumes from metal condensation and smoke. Liquid particles include mists, gases and vapor. None are present on our site.

During construction, dust is the only agent present, for which preventive measures have already been stated as above.

Biological Agents

Biological agents mostly concern the agro-industry and include (anthrax, pneumonopathy, and can produce certain allergies), parasites such as (paramecium, helminth, etc.), and possibly poisonous insect bites. These agents do not exist during the construction phase.

The project has set up construction safe work regulations according to the Ministry of the Interior to specific standards of administration and safety (Construction in workplace A.D.2008)

5.2.2 Occupational hygiene and operator safety during operation phase

Physical Agents

Physical agents in the environment which pose dangers to the operator during the operation phase are as follows:

Heat: Employees who work in the proximity of photovoltaic modules will be exposed to heat; therefore, the project has provided personal safety equipments, which includes light reducing glasses and leather gloves to reduce any impact to employee health from exposure to the high temperature.

Chemical Agents

During this phase, there is no chemical source.

Biological Agents

During this phase, there is no biological source.

During this phase, the preventive measures to reduce occupational health hazards and ensure operator safety have been well prepared by the company and are as follows:

1) Provide staff/employees of various divisions with personal safety equipment depending on their job description and the physical environment of their working area. For example, employees who work in the proximity of photovoltaic modules may be exposed to heat; therefore, the project has provided personal safety equipment, which includes light reducing glasses and leather gloves to reduce impact to employee health from exposure to the high temperature.

2) Preparation of an emergency plan and procedures for preventing danger.

The project has set up emergency procedures for individuals and for each department in order to avoid confusion and informed every one of their expected duties and the required procedures if an emergency occurs. The emergency plan with details has been distributed along with the fire control emergency plan.

The operation of photovoltaic power farms could, in rare circumstances, result in fire occurring in the control building and office. Portable fire extinguishers (type ABC Dry Chemical) are provided and installed in the building in accordance with NFPA (National Fire Protection Association) Standards and a fire alarm system has been installed in order to immediately provide a warning when there is a fire occurrence. An automatic sprinkler system for extinguishing fires has also been installed on the ceiling of the building, and will be activated upon reaching the set temperature.

3) Other safety measure, include

- Have staff regularly inspect and confirm that the safety system in good condition,
- Have security guards to regularly inspect working area in order to ensure the safety of the working place and supervise all employees to ensure that they strictly comply with the safety measure,
- Regularly distribute information concerning safety in order to motivate employees to be aware of safe work rules,
- Provide the employees with regular training on working safe and fire prevention.

All the above occupational hygiene and safety measures are appropriate and sufficient to prevent/reduce the incidental accident and unsafe working conditions. Therefore, the impact on occupational hygiene and safety will be expected to be low.

5.3 Safety administration system, plan and operational monitoring

The project includes a safety administration system to develop plans and monitor operations as follows:

5.3.1 Administration system for fire prevention.

Construction phase

In this period, the project could experience a fire so fire prevention measures are set up as follows:

- Contractor must provide 24 hours security guards,
- Not allow outsiders to enter the construction site without permission,
- Provide workers with training in order to give knowledge and warn them to be careful about fire hazards,
- Provide Fire extinguishers around the construction site,
- Store flammable materials or chemicals separately and away from hot working areas and also to post general warning signage including do not smoking in the risk area,

Operational phase

The project control system is located in a building which has a fire prevention system and fire warning system, including basic fire extinguishers. Therefore, it is expected to have low fire impact and risk from the project operation.

5.3.2 Administrations system for occupational hygiene

Construction phase

1) Any Contractors hired will have to consider safety management clauses contained in the contract agreement between the Project Owner and the Construction Company and it will specifying that safety and workers' health management must be implemented in the project.

2) Contractors will have to provide operators with proper and sufficient personal safety equipment including helmet, safety shoes, safety glass, gloves, safety belt and noise reducing gear. Also, contractors have to regularly inspect this equipment and supervise their usage.

3) Post warning signage or posters promoting safe work in essential areas such as "Construction Area", "Reduce speed", "Wear your Helmet", etc.

4) Provide first aid kits and a vehicle must be on standby to take any injured person to hospital.

5) Contractors must make sure all staff strictly comply with all safety regulations.

Operational Phase

1) Assign a person to be responsible for occupational hygiene and safety trainings, especially trainings related to safe work practice procedures.

2) Apply work permit system before allowing any worker onto the site.

3) Prepare a fire emergency plan which includes instructions on the Fire Alarm System (such as Fire Control Panel, Smoke Detection System, Heat Detection System, Bell Alarm System, etc.) and Fire Suppression System (such Fire Hose System and Fire Hydrant) in accordance with NFPA Standard. Provide a fire prevention plan, evacuation procedure, fire drill, evacuation of people out of buildings and adjacent areas in the case of an emergency. The officer must check staff's readiness and provide fire drills at least once a year.