

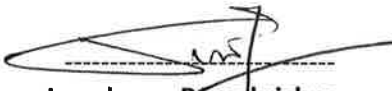
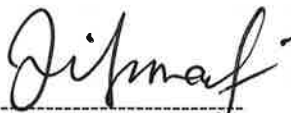



DIMENSION BID

WIRELINE INTERVENTION | PERFORATION SERVICES

CHEMICAL, PHYSICAL, RADIATION & EXPLOSIVE HAZARDS DBSB-HSE-05

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HSE-MS	CHEMICAL, PHYSICAL, RADIATION & EXPLOSIZE HAZARDS	DBSB-HSE-05-00	
		Rev.02	2014

AMENDMENT RECORDS

This sheet will record all amendment of this Procedure. All particulars of the amendment shall be stated clearly. The HSE Department of Dimension Bid (M) Sdn. Bhd. (DBSB) shall be responsible for the maintenance and update of this record sheet.

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HSE-MS	CHEMICAL, PHYSICAL, RADIATION & EXPLOSIVE HAZARDS Noise Hazard	DBSB-HSE-05-01	
		Rev.02	2014

Subject **Physical Hazards – Noise Hazards**

Rules Hearing protection must be worn in all workplaces or locations where the noise level exceeds 90 dBA (decibels)

Definition Noise is a series of undesirable sound pressure wave. It would cause annoyance and disturbance and if the level is high enough it would also cause a permanent, or a temporary hearing loss.

Symptoms of hearing loss If a person has been exposed to too much noise, he may experience what is called a “Threshold Shift” which is a temporary noticeable loss of hearing.

With the temporary shift, a person’s hearing will normally recover in a few hours but continued exposure will lead to permanent hearing loss.

Threshold Limit Value (TLV) The TLV refer to the noise level where it is believed that nearly all workers can be exposed to noise repeatedly day after day, without an adverse effect on their hearing.

Because of individual susceptibility, a small percentage of workers may experience some discomfort at levels lower than the TLV.

Noise Exposure

Duration (hours)	Noise Level (dBA)
16	80
8	85
4	90
2	95
1	100
½	105
¼	110
1/8	115

HSE-MS	CHEMICAL, PHYSICAL, RADIATION & EXPLOSIVE HAZARDS Heat Stress & Exhaustion	DBSB-HSE-05-02	
		Rev.02	2014

Subject	Physical Hazards – Heat Stress & Heat Exhaustion
Definition	Heat stress includes a number of disorders caused by heat and includes heat exhaustion, heat stroke, heat cramps, heat rash and heat fatigue.
Cause of heat Stress	Heat stress is caused by a combination of factors. Generally, the more severe forms such as heat exhaustion are caused when the body's temperature control mechanism fails and the core body temperature rises. This occurs when the heat a person expose to, the heat generated by muscles while doing work exceeds the body's ability remain at the proper temperature. The body cooling is also affected by ventilation and humidity.
Symptoms, Heat Exhaustion	<ol style="list-style-type: none"> 1) Hot dry skin. Sweating fails and stop. 2) Confusion and loss of consciousness. 3) Fatigue, nausea, giddiness, headache.
Thirst indication	Thirst is not a good indicator that the body is getting low on liquids. The quantity and color of urine is much better indicator. If a worker urine production is very low and the urine color is dark, a worker is not drinking enough water and that indicate the body is low on liquid.
Prevention	Worker should be provided with drinking water easily accessible so they don't have to leave the work location and they should drink at least enough water if they involved in heavy work in hot weather. The water should be cool but not cold.
Salt	The body salt content will be reduced from sweating. This salt needs to be made up by encouraging worker to use table salt with their meals. The use of salt tablets is not encouraged because they can cause stomach problems. If the body's salt content is reduced too low level and the worker is getting enough water, he may experience muscle or heat cramps.
Rest periods	If worker begin to show signs of heat stress, the frequency and duration of rest or breaks should be increases.
Clothing	The type of clothing a worker wears also affected the body's ability to cool itself. If the work requires heavy or special clothing, the time a worker can continue heavy work in hot environments is further reduced.
Water requirements	At least 2 glasses every 2 hours doing heavy work in hot environments. Drinking water should be supplied on site and the workers encourage to drink lots of water.
Heat Strokes	Heat stoke is life threatening. Immediate treatment is required. Cool the person with a towel or cloth of cool water. Rehydration by medical personnel may be required. Heat stroke is caused by reduction of the water content in the blood.

HSE-MS	CHEMICAL, PHYSICAL, RADIATION & EXPLOSIZE HAZARDS Illumination & Lighting	DBSB-HSE-05-03	
		Rev.02	2014

Subject	Physical Hazards – Illumination & Lighting								
Purpose	To ensure lighting level are adequate in all work sites and work situations								
Illumination	<p>Sufficient high quality illumination in all work areas is the main requirement of all industries lighting.</p> <p>Personnel must be able to observe and effectively control the operation and maintenance of machines and processes.</p> <p>Natural daylight is often not available. Therefore electrical lighting systems must be designed and installed to maintain good lighting conditions.</p>								
Lighting	<p>It is an important that the lighting is designed so as to continue the general level of illumination in areas adjacent to the windows or wall.</p> <p>Distribution of light from light source is important. Highly concentrated distributions make high mounting heights economically feasible. Low mounting heights allow a widespread type of distribution.</p>								
Electric lighting	<p>There are 3 forms of electrical lighting used in industrial areas:</p> <table><tr><td>General Lighting</td><td>General lighting procedures relatively uniform illumination throughout the area. It is a distribution of light where the maximum and minimum illumination at any point.</td></tr><tr><td>Localized general lighting</td><td>Localized general lighting reinforces the general lighting in specific areas through the use of additional general lighting.</td></tr><tr><td>Supplementary Lighting</td><td>Supplementary lighting is used to provide higher illumination for small or restricted areas where levels cannot be readily obtained by general lighting. Also used to furnish a specific brightness, color or special positioning of light sources.</td></tr></table>			General Lighting	General lighting procedures relatively uniform illumination throughout the area. It is a distribution of light where the maximum and minimum illumination at any point.	Localized general lighting	Localized general lighting reinforces the general lighting in specific areas through the use of additional general lighting.	Supplementary Lighting	Supplementary lighting is used to provide higher illumination for small or restricted areas where levels cannot be readily obtained by general lighting. Also used to furnish a specific brightness, color or special positioning of light sources.
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Glare	<p>Glare may be defined as brightness that can cause discomfort, interference with vision, and eye fatigue. It reduce the detail of the visual task thus increasing accident hazards.</p>								
Reducing glare	<p>Direct glare is caused by a source of lighting within the field of view and may be decreased by:</p> <ol style="list-style-type: none">1) Decreasing the brightness of the light source.2) Repositioning the light source.3) Increasing the brightness of the area surrounding the glare source.								

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Reducing reflected glare Reflected glare is caused by high brightness images reflecting from shiny walls, ceilings, materials and etc.

Reflected glare may be reduced by:

- 1) Decreasing the brightness of the light source.
- 2) Increasing the level of illumination by increasing the number sources.
- 3) Changing the character of the offending surface.

HSE-MS	CHEMICAL, PHYSICAL, RADIATION & EXPLOSIVE HAZARDS Material Safety Data Sheet (MSDS)	DBSB-HSE-05-04	
		Rev.02	2014

Subject **Material Safety Data Sheet (MSDS)**

MSDS All hazardous chemicals and substances used by DB shall be supplied with Material Safety Data Sheet (MSDS) or Chemical Safety Data Sheet (CSDS).

This document shall be provided at the time the chemicals or substances arrive from the supplier.

The following information will be supplied on the MSDS or CSDS:

Physical Data	Chemical name Color Form (Liquid/Solid/Gas/etc) Specific gravity Boiling point
Fire & Explosion Hazard	Characteristic Flash point Extinguishing media Special firefighting equipment and hazard
Reactivity Hazard	Stability Incompatibility Hazardous Decomposition Hazardous Polymerization
First Aid Procedures	Eye Contact Skin Contact Swallowing Inhalation
Handling Precautions	PPE Ventilation Respiratory procedure Exposure guidelines
Spill & Disposal Procedures	Special handling Disposal methods for drum or container Degradability Fish toxicity Animal toxicity
Special Precaution	Physical hazards Handling and storage precautions Packaging requirements

Work Permit Involves This information will be available to the operations if there are any activities which involve the use of hazardous chemical and substances.

A copy of MSDS or CSDS will be attached to the work permit and the JSA upon work permit issuance to ensure that the personnel working with the

HSE-MS	CHEMICAL, PHYSICAL, RADIATION & EXPLOSIVE HAZARDS Material Safety Data Sheet (MSDS)	DBSB-HSE-05-04	
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chemical or substances have read and understood the precautions.

Refer to OSHA for details.

Refer to DBSB-HSE-03-01 (Job Safety Analysis_JSA) and DBSB-HSE-03-02 (overview of Permit to Work) for details.

Refer to client's requirement, rules and regulation for details.

Storage & Handling Instructions

The storage and handling instructions on the MSDS or CSDS will be adhere to when the storing the chemical or substances.

Refer to OSHA for details.

Refer to DBSB-HSE-06-01 (General Safety) and DBSB-HSE-06-02 (Drum Handling) for details.

Refer to client's requirement, rules and regulation for details.

HSE-MS	CHEMICAL, PHYSICAL, RADIATION & EXPLOSIVE HAZARDS Chemical Hazards	DBSB-HSE-05-05	
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Subject **Chemical Hazards**

Chemical Hazards The safe of chemical & substances handling and knowledge about their effect on human body as well as first aid is a fundamental part of an effective safety program.

Refer to OSHA Regulation 1997 (Classification, Packaging and Labeling of Hazardous Chemicals) for chemical details of flammable/reactivity/hazard rating/etc.

Refer to DBSB-HSE-05-04 (Material Safety Data Sheet) and Chemical MSDS/CSDS for details.

Methods of entry to human body Chemicals may affect a person in a number of ways. There are generally 3 methods:

- 1) Inhalation
- 2) Injection
- 3) Skin absorption
- 4) Ingestion

Toxicity This refers to the ability of a chemical agent to produce a harmful effect on the health or wellbeing of a living organism.

The probability that chemical agent will produce harm because of specific conditions with 2 types of effects:

Chronic effect A prolonged exposure occurring over a period of days, weeks or years.
The effect of the chemical may not be immediately apparent. The effect may occur sometime after the exposure has ceased.

Carcinogen A substance which causes cancer.
Dermatitis Inflammation of skin from any cause. Two types which are primary irritation dermatitis & sensitization dermatitis.

Mutagenic Able to produce heritable changes in genetic.

Teratogen Capable of causing gross deformity of fetus.

Acute effect An intense exposure over a relatively short period of time.
May be a single contact with chemical. Effect of the chemical may be almost immediately.

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MSDS/CSDS Refer to DBSB-HSE-05-04 (Material Safety Data Sheet) and Chemical MSDS/CSDS for details.

PPE These details shall be available to personnel required to work with chemical and correct PPE must be worn

Refer to DBSB-HSE-05-04 (Material Safety Data Sheet) and Chemical MSDS/CSDS for details.

Refer to DBSB-HSE-02 (Personal Protective Equipment) for details.

Refer to client's requirement, rules, and regulations for details.

Refer to OSHA Regulation 2000 (Use and Standards of Exposure of Chemicals Hazardous to Health) for details.

Fire Fighting The correct type of firefighting media shall be available at all time when chemical are being handled or use.

Refer to DBSB-HSE-05-04 (Material Safety Data Sheet) and Chemical MSDS/CSDS for details.

Refer to OSHA Regulation 2000 (Use and Standards of Exposure of Chemicals Hazardous to Health) for details.

Refer to client's requirement, rules, and regulations for details.

Emergency Plan Action plan shall be established for emergency situation and on manufacturer data from the MSDS/CSDS.

Refer to DBSB-HSE-05-04 (Material Safety Data Sheet) and Chemical MSDS/CSDS for details.

Refer to DBSB-HSE-13 (Emergency Preparedness & Response Procedures) for details.

HSE-MS	CHEMICAL, PHYSICAL, RADIATION & EXPLOSIVE HAZARDS Radioactive Materials	DBSB-HSE-05-06	
		Rev.02	2014

Subject **Radioactive Materials**

Radioactivity is a part of nature. Everything is made of atoms. Radioactive atoms are unstable; that is, they have too much energy.

When radioactive atoms spontaneously release their extra energy, they are said to decay. All radioactive atoms decay eventually, though they do not all decay at the same rate. After releasing all their excess energy, the atoms become stable and are no longer radioactive.

The time required for decay depends upon the type of atom. This Fact Sheet explains the process of radioactive decay.

The Atoms

The explanation of radioactive decay begins with a description of the atom. Atoms are made up of three subatomic particles: protons, neutrons, and electrons.

The protons and neutrons are packed together in the nucleus at the center of the atom (see Figure 1).

The space outside the nucleus is occupied by the electrons. The number of protons in the nucleus determines what material, or element, the atom is.

For example, if the nucleus contains 8 protons, the atom is oxygen. If the nucleus contains 17 protons, the atom is chlorine.

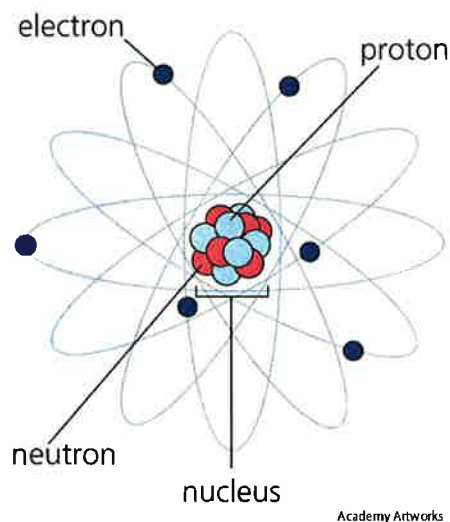


Figure 1: The Atom

Isotopes and Nuclides

While all atoms of the same element contain the same number of protons, the number of neutrons may be different. For example, carbon atoms have six protons. If a carbon atom also has six neutrons, it is Carbon-12. If it has seven neutrons, it is Carbon-13. A carbon atom containing six protons and eight neutrons is Carbon-14. This form or **isotope** of carbon is radioactive. Carbon-14 is radioactive while Carbon-12 and Carbon-13 are stable.

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Radioactive Decay

When the nucleus of a radionuclide spontaneously gives up its extra energy, that energy is called ionizing radiation. Ionizing radiation may take the form of alpha particles, beta particles, or gamma rays. The process of emitting the radiation is called radioactive decay (See figure 2).

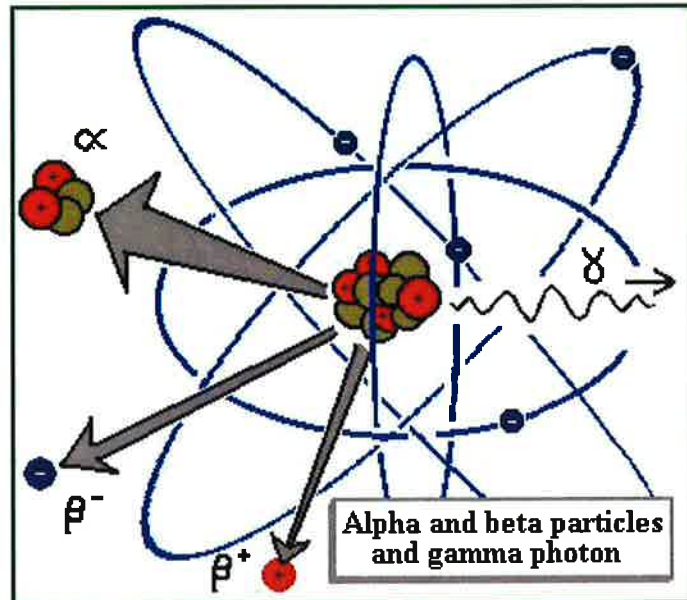


Figure 2: Radioactive Decay

Decay Chain

When the nucleus of a radioactive atom decays, giving up its excess energy, the nucleus is altered. It is transformed into another atom which in many cases is a different element. This new atom may be stable or unstable. If it is stable, the new atom is not radioactive. If it is unstable, it also will decay, transforming its nucleus and emitting more ionizing radiation. Several decays may be required before a stable atom is produced.

Half-Life, $t_{1/2}$

Period of time it takes for the amount of a substance undergoing decay to decrease by half.

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Hazard associated to Radioactive material

Irradiation of internal organs and tissues can occur due to active materials entering the body by the following routes:-

- Direct Skin Irradiation
- Inhalation
Depending on the particle size the material may become lodged in different areas, e.g. large particles in the nose. Some elements concentrate in specific organs, e.g. in thyroid.
- Ingestion
Usually insoluble material will pass through the gut and be excreted, but soluble material will find its way to the whole body or to specific organs.
- Wounds
This route operates in a similar way to ingestion



Figure No. 3: Official Radioactive symbol

HSE-MS	CHEMICAL, PHYSICAL, RADIATION & EXPLOSIVE HAZARDS Non-ionizing Radiation	DBSB-HSE-05-07	
		Rev.02	2014

Subject Non - Ionizing Radiation

Definitions Non-ionizing radiation refers to any type of electromagnetic radiation that does not carry enough energy per quantum to ionize atoms or molecules—that is, to completely remove an electron from an atom or molecule.¹ Instead of producing charged ions when passing through matter, the electromagnetic radiation has sufficient energy only for excitation, the movement of an electron to a higher energy state

Non – ionizing radiation source Example for Non – ionizing radiation as (see figure no.4):-

1. Near ultraviolet
2. Visible light
3. Infrared
4. Microwave
5. Radiowave
6. Low Frequency RF (Longwave)

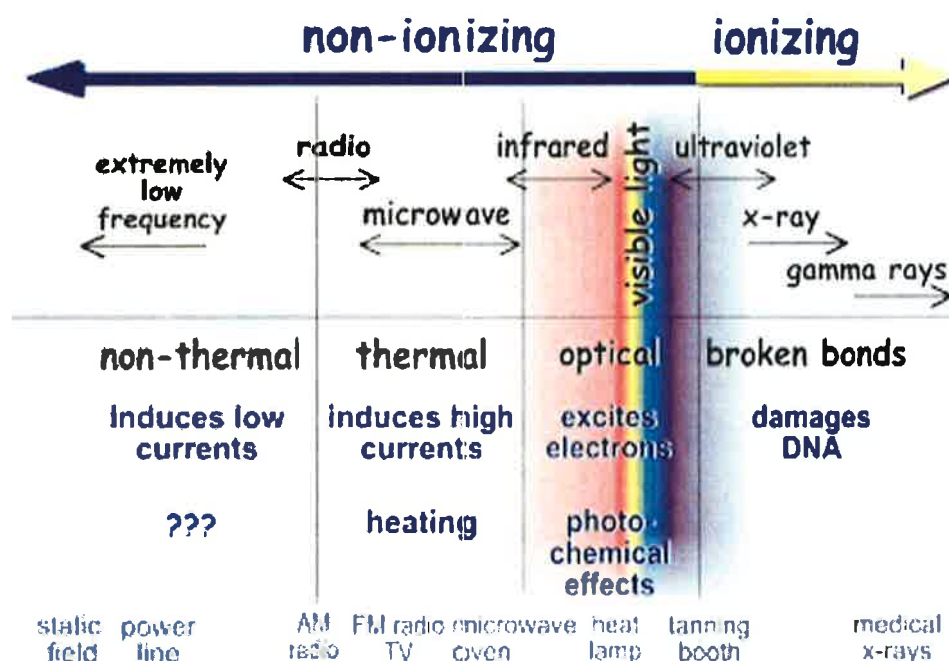


Figure No 4: Non – ionizing radiation

Hazards and health affect associated to non – ionizing radiation

Hazard and health affect associated to non – ionizing radiation as follows:

Non – ionizing Radiation	Hazards	Health affects
Visible light	Laser	Skin burn, retinal injury
Static field	Magnet	Vertigo, nausea
Microwave	Wi-Fi	Heating body tissue
Low-frequency RF	Power line	Disturbance of nerve system
Radio frequency	Radio	Heating body tissue

Sign for non – ionizing radiation as figure no. 5

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Figure no 5: Non – Ionizing Radiation

HSE-MS	CHEMICAL, PHYSICAL, RADIATION & EXPLOSIVE HAZARDS Explosive	DBSB-HSE-05-08	
		Rev.02	2014

Subject Explosive

General Reactive substance that contains a great amount of potential energy that can produce an explosion if released suddenly, usually accompanied by the production of light, heat, sound, and pressure

Explosive Classification There are two different systems of classifying explosives, one for storage and one for transportation. Explosives are classed by their composition while stored, and explosives being transported or shipped are classed by their hazard. The hazard is determined by a number of interrelated variables that include packaging, chemical composition, detonation sensitivity, etc.

There is no way to cross-reference the two systems of classification; each is a separate entity. Therefore, personnel who work with explosives must know both systems of classification and apply them as the situation demands.

Classification of Explosives for Storage Chemical explosives into three main categories: flammable solids, low explosives or deflagrating, and high explosives or detonating. They differ by orders of magnitude in reaction rate and pressures that are developed.

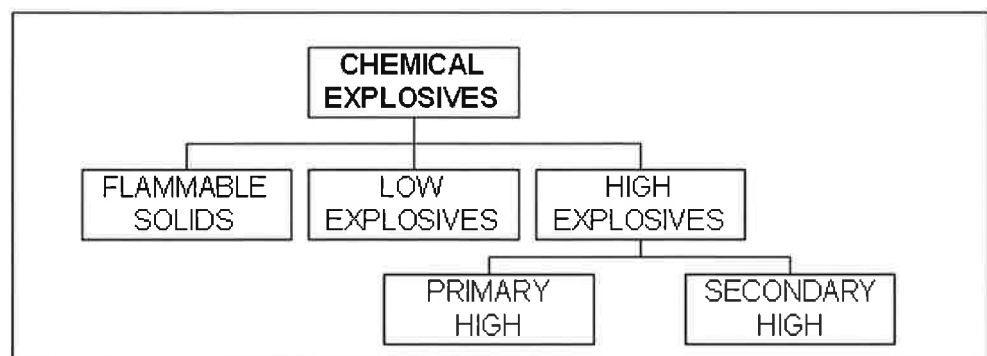


Figure 01: Chemical Explosive Classification

Explosive's Hazard Class There are nine Hazard Classes numbered one through nine. Explosives are Hazard Class 1. Additionally, Hazard Class 1 (Explosives) is further subdivided into six Divisions, 1.1 through 1.6. The definition for each Division and examples of explosives used by Dimension Bid within each Division are listed below:

Division 1.1

A package of explosives that have a mass explosion hazard. Division 1.1 explosives that may be encountered in the field are:

- Detonating cord,
- Some large shaped charges,
- Some cutters,
- Some perforating guns,
- Some detonators and
- Any charges combining more than 200 pounds total explosive weight.

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Division 1.2

A package of explosives that have a projection hazard. Division 1.2 explosives are normally not encountered in the field.

Division 1.3

A package of explosives that have a fire hazard with a minor blast or projection hazard. Division 1.3 explosives are normally not encountered in the field.

Division 1.4

A package of explosives that present a minor explosion hazard. Division 1.4 explosives encountered in Dimension Bid include:

- Most shaped charges,
- Igniters,
- Most detonators,
- Boosters,
- Most cutters,
- Powder charges,
- Perforating guns with less than 200 pounds total explosive weight (transported under UN0494) and
- Some seismic charges.

Division 1.5

A package of very insensitive explosives that have a mass explosion hazard. Division 1.5 explosives are normally not encountered in Dimension Bid operations.

Division 1.6

A package of extremely insensitive articles that do not have a mass explosion hazard. Division 1.6 explosives are normally not encountered in Dimension Bid operations.