

INSTRUCTIONS FOR USING THE RISK ASSESSMENT FORM

1. Envisage the task in hand and identify the hazards associated with carrying out the task. These hazards are to be listed and addressed individually in the risk assessment form.
2. Once the hazard has been identified, based on the combination of the likelihood and severity/consequence of the hazard, the risk evaluation score is to be assigned using the risk evaluation matrix on the last page. For example, a hazard which has a likelihood of 'unlikely' and a severity/consequence of "harmful", the risk evaluation score would be (moderate risk).
3. With the determination of the risk evaluation score, using the recommended response table on the last page, appropriate action is to be planned and implemented.
4. Using the above example of a risk evaluation score of 4 (moderate risk), appropriate controls must be applied to the risk and these must be listed out accordingly in the form along with the person responsible for applying the control and the completion date.
5. Once the controls have been applied, the risk must be reassessed as a whole taking into account the applied controls and once again using the risk evaluation matrix on the last page, a residual score must be obtained.
6. If the residual risk on reassessment is 'Trivial' or 'Tolerable' (scores 1 and 2), then no additional controls are required and only effective monitoring of the task to ensure compliance with procedures is necessary.
7. However, if the reassessment of the risk again is 'Moderate', 'Substantial' or 'Intolerable' and yields a score higher than 2, it implies that the applied controls are not sufficient to address the associated hazards and therefore do not bring the risk to a safe level. This would require additional controls to be applied and steps 4 and 5 to be followed once again.
8. This process would continue until the residual risk is eventually brought down to an acceptable level (scores 1 or 2).
9. Effective supervision of the task to be carried out is necessary to ensure that there are no unauthorized and unsafe diversions which could effectively change the entire risk assessment therefore making it inappropriate for the current task.

This form is for guidance purposes only and does not replace any company procedures or applicable statutory regulations.

VESSEL NAME:			ACTIVITY: Entry into enclosed spaces	PERSONNEL INVOLVED IN THE TASK: Master, all officers and crew		
HAZARD CATEGORY	POTENTIAL HAZARDS IDENTIFIED	RISK EVALUATION SCORE (Refer page 9)	POSSIBLE CONTROL MEASURES REQUIRED (including existing & proposed)	ACTION		RESIDUAL RISK SCORE (Refer page 9)
				PERSON RESPONSIBLE	DATE COMPLETED	
Injury/fatality to person	Failure to correctly identify an enclosed space.	Likely (3) x Harmful (2) = 6 Substantial (example only)	<p>No entry to be permitted into an enclosed space unless the prescribed enclosed space entry procedures are followed and a permit to work issued. This must include a formal risk assessment to identify potential hazards and risk mitigation methods to control them accordingly.</p> <p>An Enclosed Space Register identifying enclosed spaces onboard to be produced, using risk assessment and continuous review. The register to be kept up to date as appropriate to ensure its continued validity, particularly after loading and during the carriage of cargoes that may adversely affect the safety of the atmosphere within a space</p> <p>It must be kept in mind that a toxic atmosphere can exist in all enclosed spaces (on all vessel types - not necessarily on tankers) including the connected and adjacent spaces. Enclosed space entry procedures must be carried out for all personnel entering an enclosed space on board and not only limited to ship's personnel.</p>	Master, all officers and crew.		Highly Unlikely (1) x Harmful (2) = 2 Tolerable (example only)

Injury/fatality to person	Tank atmosphere not conducive to man entry.	(To be assessed and completed)	<p><u>If a crew member is not comfortable with the atmosphere, they must be made aware that they have the right to refuse entry into the enclosed space.</u></p> <p><u>If hot work or other tasks are to be performed within an enclosed space, an additional permit to work must be issued to supplement the enclosed space entry permit.</u></p> <p>Enclosed space entry procedures to include but are not limited to:</p> <ul style="list-style-type: none"> • Atmosphere testing <ul style="list-style-type: none"> -This must be done prior to entry and ideally witnessed by more than one responsible person. -Ventilation must be stopped for at least ten minutes prior to atmosphere testing to allow the atmosphere to settle down. -Atmosphere tests to include testing for oxygen content, carbon dioxide, hydrocarbon (HC) vapour concentration and any other toxic gases are present, in line with the industry best practices and applicable regulations. - Testing of the space to be carried out at many different levels using a calibrated and tested gas equipment. -Due consideration must be given to pockets of gases that may exist in corners and/or may be regenerated due to cargo residue. -Atmosphere must be retested if there are any breaks in operation and/or ventilation. -When entering cargo/bunker tanks, the atmosphere of adjacent spaces must also be tested and for tankers, de-pressurized as required to reduce chances of any inter-tank leakage of gas. <p>(cont'd)</p>	Master, all officers and crew.		(To be assessed and completed)
---------------------------	---	--------------------------------	---	--------------------------------	--	--------------------------------

Injury/fatality to person	<p>Fall inside/into the enclosed space.</p> <p>Ingress of water/drowning of personnel.</p> <p>Rescue equipment not readily available.</p>	(To be assessed and completed)	<ul style="list-style-type: none"> Continuous ventilation of the space must be carried out throughout the operation. If any breaks in ventilation, the permit criteria must be reassessed and reissued. Forced ventilation must be preferred over natural. Atmosphere must be monitored by the attendant throughout the operation. In addition, Personal Gas Meters to be used by the personnel entering the enclosed space throughout the operation with personal gas detectors. Appropriate means for controlling and monitoring entry into the enclosed space must be in place to prevent accidental / unauthorised entry via safety notices, mechanical barriers etc. <ul style="list-style-type: none"> -Access to some enclosed spaces may be constricted owing to construction and hence due consideration must be given to assess methods for removing a casualty. -Open enclosed space accesses to be protected to mitigate the possibility of personnel from falling in. Prior to entry into the enclosed space: <ul style="list-style-type: none"> -Associated piping, cargo ventilation/ inert gas systems, electrical sources, hydraulic systems to be isolated (lockout/tag out) with adequate warning signs against operation. -Approved self-contained positive pressure breathing and resuscitation equipment must be ready at the entrance of the space. Air bottles must be fully charged prior to the operation. -Personnel entering the space must wear appropriate protective clothing. <p>(cont'd)</p>	Master, all officers and crew		(To be assessed and completed)
---------------------------	---	--------------------------------	--	-------------------------------	--	--------------------------------

Injury/fatality to person		(To be assessed and completed)	<p>-Emergency Escape Breathing Devices (EEBDs) to be readily available to facilitate easy escape of the persons in the enclosed space. <u>Cannot be used for entry into enclosed spaces - for emergency evacuation only!</u></p> <p>-An oxygen resuscitator to be readily available at the entrance to the space.</p> <p>-It is recommended that the persons entering the enclosed space wear the harness prior to entry to facilitate easy rescue in case required.</p> <p>-A stretcher to be readily available at the entrance at the entrance of the space.</p> <p>-All electric/electronic equipment to be used inside the enclosed space to be intrinsically safe and fully charged</p> <p>-Lighting in the enclosed space must be adequate. Unless hot work permit allows the use of non-intrinsically safe lighting. Any means of illumination must be intrinsically safe.</p> <p>-An attendant (with suitable training) to be at the entrance of the space at all times and in direct contact with the personnel inside the enclosed space and the command centre (bridge or control room) as appropriate.</p> <p>-Frequent communication at agreed intervals to be made with the personnel during the operation to ensure that they are ok.</p> <ul style="list-style-type: none"> Emergency procedures including evacuation and rescue from enclosed spaces to be included in the company operating procedures and discussed during the toolbox meeting prior to undertaking the operation. <p>(cont'd)</p>	Master, all officers and crew		(To be assessed and completed)
---------------------------	--	--------------------------------	--	-------------------------------	--	--------------------------------

Injury/fatality to person	Lack of experience/training.	(To be assessed and completed)	<ul style="list-style-type: none"> • <u>In the event of a casualty in an enclosed space, under no circumstance should the attendant nor any unauthorised personnel enter the tank without following the proper emergency response plan.</u> • Mandatory training drills (SOLAS Regulation III/19) to be conducted on board for all personnel associated with enclosed space entry or rescue responsibilities at least every two months. These drills to include checking and use of: <ul style="list-style-type: none"> -Personal protective equipment required for entry -Communication equipment and procedures -Instruments for measuring the atmosphere in enclosed spaces. -Rescue equipment and procedures. -First aid and resuscitation equipment including life saving techniques. • <u>Entry into enclosed spaces with suspect atmosphere must only be considered in an emergency situation when no practical alternative exists. Permission to do so must be obtained from the vessel's owner/operator. This entry must be carried out with special precautions including entering personnel wearing a positive pressure type breathing apparatus and a lifeline attached to the harness. A special detailed risk assessment needs to be carried out and discussed with all involved.</u> 	Master, all officers and crew		(To be assessed and completed)
---------------------------	------------------------------	--------------------------------	---	-------------------------------	--	--------------------------------

Injury/fatality to person	Lack of communication.	(To be assessed and completed)	<ul style="list-style-type: none"> • A log is to be maintained of the personnel entering with the timings of entry and exit to ensure nobody is left behind. • Communication systems must be intrinsically safe, fully charged and tested and lines of communication decided. • Any equipment being opened in an enclosed space including pumps, valves, pipe lines or heating coils must be thoroughly flushed with water prior to commencing of work. • Tools must be made of spark proof material and in case of any hammering/use of power tools, additional safety precautions must be made to satisfy that hydrocarbon vapours do not exist in the vicinity. • Tools must be lowered as far as possible, into the enclosed space and not carried by entering personnel to mitigate the risk of generating sparks from dropped tools. • Any removal of residue, sludge or sediment from an enclosed space must require additional and periodic atmosphere tests as well as use of personal gas monitors. Ventilation must be continuous. 	Master, all officers and crew		(To be assessed and completed)
	Fire/explosions during enclosed space entry.					
	Failure to follow pump room entry procedures.		<p>Cargo Pump Rooms</p> <ul style="list-style-type: none"> • Cargo pump rooms are also considered enclosed spaces, however due to their unique complexities, a few additional special precautions need to be taken. <p>-Mechanical ventilation needs to be continuously running throughout the validity of the pump room permit.</p> <p>-Valid pump room entry permit to be displayed at the entrance of the pump room.</p> <p>(cont'd)</p>			

Injury/fatality to person		(To be assessed and completed)	<p>-Safety equipment such as a harness (readily rigged to an overhead pulley and extending to the bottom of the pump room), portable gas detection meter and stretcher to be readily available at the pump room top platform.</p> <p>-Continuous monitoring of the pump room's atmosphere with audio-visual alarm. System to be tested and calibrated with appropriate span gas prior to the issuance of every permit.</p> <p>-Separate risk assessment and risk mitigation procedures to be adopted for working in cargo pump rooms.</p> <p>-Minimum number of persons to undertake routine pump room rounds to minimise exposure.</p> <p>-Entry to be reported to the control room/bridge and a log to be maintained of personnel going in and out of the pump room.</p> <p>ON COMPLETION OF ENCLOSED SPACE ENTRY</p> <ul style="list-style-type: none"> On the completion of the enclosed space entry, the responsible person must ensure that all personnel have evacuated the space and that: <ul style="list-style-type: none"> -All equipment has been removed. -Access to the space sealed. -The permit is closed out and signed off. -All locked, isolated or tagged out systems are restored. 	Master, all officers and crew		(To be assessed and completed)
	Date:		Name/Rank/Sign:			

RISK EVALUATION MATRIX TO OBTAIN SCORE

		Severity/Consequence		
		Slightly Harmful (1)	Harmful (2)	Extremely harmful (3)
Likelihood	Highly Unlikely (1)	Trivial Risk (Score 1)	Tolerable risk (Score 2)	Moderate Risk (Score 3)
	Unlikely (2)	Tolerable Risk (Score 2)	Moderate Risk (Score 4)	Substantial Risk (Score 6)
	Likely (3)	Moderate Risk (Score 3)	Substantial Risk (Score 6)	Intolerable risk (Score 9)

THE TABLE BELOW INDICATES THE RECOMMENDED RESPONSE IN EACH CASE.

Trivial	No action is required.
Tolerable	No additional controls are required. Monitoring is required to ensure control is maintained.
Moderate	Efforts are required to reduce risk. Controls are to be implemented within a specified time.
Substantial	New work not to start until risk reduced. If work is in progress, urgent action to be taken. Considerable resources may be required.
Intolerable	Work shall not be started or continued until the risk has been reduced. If reduction is not possible, the activity shall be prohibited.

This form is for guidance purposes only and does not replace any company procedures or applicable statutory regulations.