



NORTH MALAY BASIN

INTEGRATED GAS DEVELOPMENT

FULL FIELD DEVELOPMENT

NMB EHS PROJECT RISK MATRIX

HESS EXPLORATION & PRODUCTION MALAYSIA B.V.

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AMENDMENT HISTORY				
REVISION NO.	DATE	DESCRIPTION OF AMENDMENTS	APPROVER	SECTIONS
04	23.07.2019	Appendix 4 – Risk Ranking Standard Work Instruction (SWI) is updated with recommendation and residual risk assessment input.	VG	Appendix 4



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ABBREVIATIONS

ALARP	As Low As Reasonably Practicable
CPP	Central processing platform
CRA	Construction Risk Assessment
EHS	Environment Health Safety Department
HAZID	Hazard Identification
HAZOP	Hazard and Operability
HC	Hydrocarbon
PEAR	People, Environment, Asset and Reputation
RAM	Risk Assessment Matrix
SOP	Standard Operating Procedure
SWI	Standard Work Instruction
WHP	Well Head Platform



1. INTRODUCTION

In conducting the COMPANY's activities, paramount importance is given to Environment, Health and Safety (EHS) and to ensure the safeguarding of people, natural environment, assets and our reputation.

The purpose of this revision is to align the way we assess EHS risk in projects with the guidelines set forth in the global Risk Management Standard (EP-ERM-STD-01000 Rev1). In addition, this revision adds a methodology section that clarifies ambiguity around how risks should be assessed

The intent of the global standard is to;

"...communicate the Hess Risk Management expectations for the portfolio, assets, major capital projects and functions. This Standard is a "living document" that is reviewed periodically. The Standard shall provide assurance to the Board of Directors that the necessary oversight and recommendations are in place with respect to Hess Corporation's policies, positions and systems for risk management. This Standard shall be used as the basis for risk management work, optimizing risk processes and sharing best practices. "



2. SCOPE

The scope of this document focuses on project risk assessments only.

The global risk management standard though applies through a wide kaleidoscope of Hess as an operating COMPANY

“to all operated and non-operated assets, major capital projects and prospects throughout their respective lifecycles (i.e., acquisition, exploration, appraisal, development, production and abandonment) and all business segments. These may include new business development opportunities, exploration, development projects or producing assets.”

This document is applicable from design right through to construction, installation, hook up and commissioning stage. Some examples of its usage could be for HAZOP, HAZID, Construction Risk Assessments (CRA) for T&I, CRA for HUC etc.



3. RISK ASSESSMENT & MATRIX

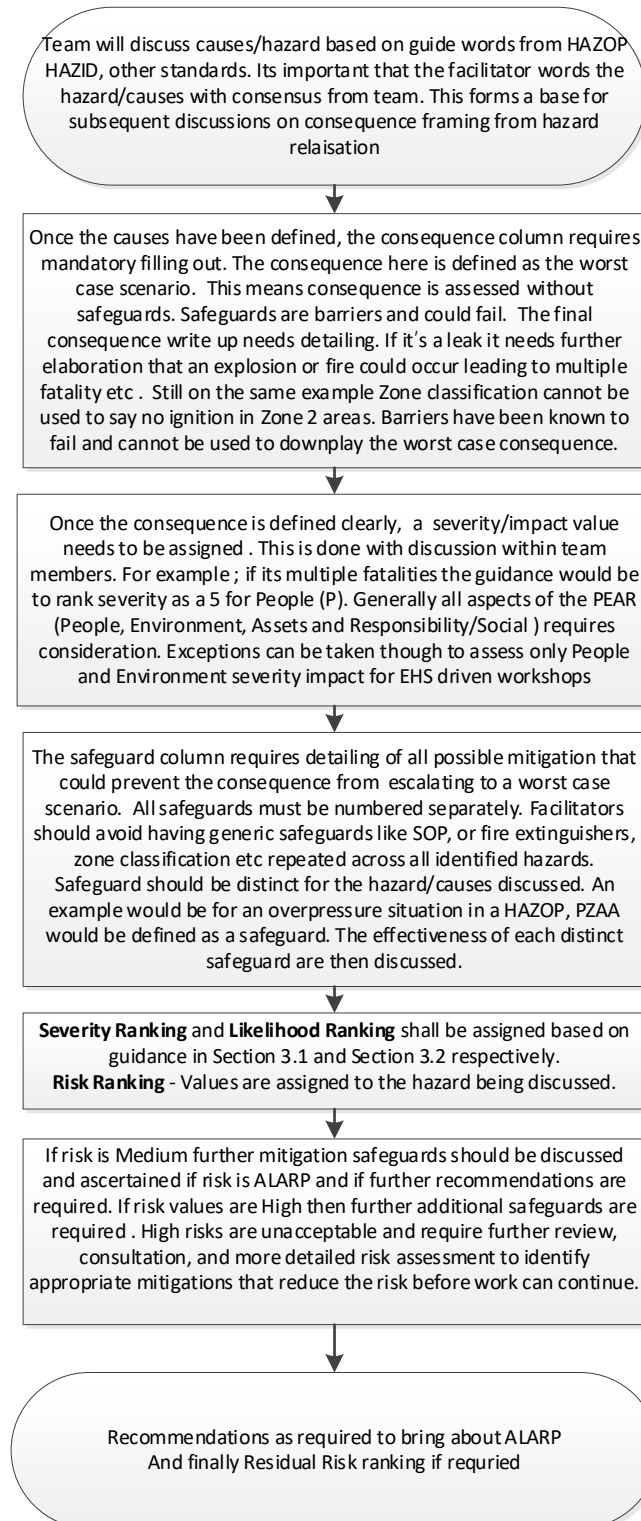
Risk assessments like HAZID, HAZOP, Construction Risk Assessment (CRA), etc. requires a risk assessment matrix (RAM)

APPENDIX 1 is the RAM adapted from global Risk Management Standard (EP-ERM-STD-01000 Rev1). Asset values associated with the severity ranking have been updated and ratified by the Malaysia ALT EHS Steering Committee ; Refer to MOM approval in APPENDIX 3

The RAM is a 5 X 5 Matrix. There are three (3) possible risk ranking values which are High, Medium and Low. High risk activities are not tolerable. Medium is generally considered as the ALARP region and finally low risk is considered as Tolerable.

Figure 3.1 is the process flow / guidance on how risk assessments shall be conducted. Worksheet template in APPENDIX 2 shall be used when conducting the risk assessments.

Figure 3.1: Methodology



3.1 CONSEQUENCES & SEVERITY RANKING

As above the process for choosing the severity/impact or consequence is via brainstorming session with the team. Double jeopardy hazards/causes are not assessed (considered not credible). The team reviews and chooses the severity descriptor which best represents the seriousness of the possible consequences that could occur. All four types of severity could be considered (People, Asset/Production, Environment and Social/Reputation). However, in view of effectiveness while assessing risks in Environment (E) Health (H) & Safety (S) workshops, if the team decides **to assess People (P) and Environment (E) this would be an acceptable approach**. Each of the severity categories are represented on the Risk Matrix by a number between 1 and 5, the value chosen must represent the highest value agreed upon by the team. For example, if People was categorised as a 5, Environment severity was a 3, then 5 (P) is the overall severity rating which should be mapped to the Risk Matrix for final risk values.

Consequence column requires worst case scenarios to be defined. The narrative requires a detailed sequence of events leading to final plausible worst case materialising. Some example of **preferred consequence narratives** are listed below

1. Release of hydrocarbon (HC) resulting in fire/ explosion leading to potential injury/ single fatality/ asset damage
2. Failure to extinguish internal enclosure fire leading to escalation of fire event resulting in potential injury/ fatality and asset damage
3. Low level in T-301 resulting in inadequate diesel to operate DEG during unavailability of GEG. Loss of AC power supply to platform

Notice the example above is described to its final outcome i.e. worst case consequence that could occur. As in 1 a HC release is defined as fire and explosion event. Safeguards are existent to largely try and prevent ignition (i.e. detectors, blowdown, zone rating etc) however consequence description will not consider safeguards. Description of consequence are in the event of failure of all barriers.

The rational for the above is that **barriers are accounted for in the likelihood evaluation. Considering it on consequence evaluation would mean double counting a barrier effect on a potential hazard**. It is an accepted convention and shall be used to drive all risk assessments workshops.



3.2 SAFEGUARDS & LIKELIHOOD RANKING

Once the consequence is assessed, the next step is assessing the likelihood. The likelihood assessments are based on industry, company data on past incidents and effectiveness of safeguards. Generic safeguards like SOP etc should be avoided. If there are specific SOP that address the risk then a named SOP can be used. Additionally, generic recovery safeguards (i.e. after the consequence comes to bear) should be avoided as well – i.e. First Aid, Medevac etc.

In the safeguard column the number of independent safeguards are vital. **As in APPENDIX 1 – a safeguard count** could be useful for likelihood estimation. Rule of thumb guide would be to count the number of safeguards listed for each Cause/Hazard. If the hazard has no existing safeguard then an E (Very High) likelihood is selected. Another example; If the Hazard has 2 safeguards the guidance would be to select a B or C as the likelihood. The more safeguards in place the more unlikely it is for a hazard to escalate into a credible worst case scenario.

3.3 RISK RANKING

Risk = Consequence X Likelihood. A combination of the (S)everity ranking and (L)ikelihood ranking results in a Risk Ranking. The " CC " column shall list the consequence category i.e. PEAR (either its People, Environment, Asset or Reputation). The convention shall be to have the (S)everity listed first followed by the likelihood (e.g 4B, 3A) in the Risk Ranking column. The risk is compared against the risk criteria.

APPENDIX 4 has the standard work instruction (SWI) for how Risk ranking is to be conducted and Do's & Don'ts



4. RISK ASSESSMENT & CRITERIA

Once the risk is assessed, it shall be compared against COMPANY's risk criteria below:

4.1 HIGH

High or Intolerable (H) : Risks are unacceptable and require further review, consultation, and more detailed risk assessment to identify appropriate mitigations that reduce the risk before work can continue.

High is illustrated on the Risk Matrix as the area shaded in red.

4.2 MEDIUM

Medium or Requires Reduction (RR) : Illustrated in yellow; Although these risks are in the tolerable range, efforts should still be made to reduce them to levels that are as low as reasonably practicable (ALARP). Further safeguards could be required to resonate with HESS's ALARP principles.

4.3 LOW

Low or Tolerable (T) : Risks are considered tolerable; which does not preclude the initiation of reductions if they are readily identified, and practicable

The immediately acceptable risk criteria is described as Low, this is the region of the Risk Matrix shaded in green.



5. RECOMMENDATION & RESIDUAL RISK

Residual risk is a concept that requires risk to be reassessed with recommendations implemented. Actions / Recommendations are in fact additional risk reduction measures. **Assessing residual risk only leads to a reassessment of likelihood ranking.** Consequence articulated on the possible worst-case credible scenario does not change in the Residual Risk Assessments.

It is not mandatory that Residual Risk be ranked. ALARP principles apply and generally it is assumed that ranking Residual Risk would only serve to change the likelihood while overall risk would largely remain the same i.e. Medium (initial) remains at Medium (residual after considering Recommendations). The team shall decide on a case by case basis if residual risk requires ranking. Generally, for EHS driven workshops like HAZOP, HAZID or CRA, the residual risk don't need to be ranked.



APPENDIX 1

EHS Risk Matrix

EHS Risk Rating Matrix

Likelihood The probability or potential that a risk scenario could occur and is categorized by reviewing and choosing a descriptor. The choice should be based upon information available, industry and/or company data on past events as well as knowledge and experience of the risk assessment team.

Application (Select highest rating of categories):

30%+	Event has or could occur more than once a year at location/project	Event can occur because existing safeguards are inadequate
20-30%	Event has or could occur once in the lifetime of location/project	Event can occur if a single safeguard fails
10-20%	Event has occurred several times in the Company	Event occurs if two or more safeguards fails
1-10%	Event has occurred in the Company or E&P Industry	Event could occur but is unlikely based on the safeguards
<1%	Event has occurred in industry	Industry best practices and design likely to prevent this event from occurring
Probability*	Descriptor	Expected Safeguards

Definition:

Tool for prioritizing risks and is used in risk assessments for development of heat maps. It defines the criteria and rating scales to assess each risk scenario by Impact (X axis) and Likelihood (Y axis).

		Severity / Impact					
Likelihood	E	Very High	MED 18	MED 19	HIGH 23	HIGH 24	HIGH 25
	D	High	MED 15	MED 16	MED 17	HIGH 21	HIGH 22
	C	Medium	LOW 6	MED 12	MED 13	MED 14	HIGH 20
	B	Low	LOW 4	LOW 5	MED 9	MED 10	MED 11
	A	Very Low	LOW 1	LOW 2	LOW 3	MED 7	MED 8
		Very Low	Low	Medium	High	Very High	
		1	2	3	4	5	

EHS Risk Tolerance

High or Intolerable (H):

Risks are unacceptable and require further review, consultation, and more detailed risk assessment to identify appropriate mitigations that reduce the risk before work can continue.

Medium or Requires Reduction (RR):

Risks must be reduced until they are as low as reasonably practicable, which means that the cost of further risk reduction is greatly disproportionate to benefits gained.

Low or Tolerable (T):

Risks are considered tolerable; which does not preclude the initiation of reductions if they are readily identified, and practicable.

Severity / Impact The impact potentially resulting from a risk scenario being realized and is categorized by reviewing and choosing a descriptor. The team reviews and chooses the impact descriptor which best represents the seriousness of the possible consequences should the event occur. All types of impact must be considered (People, Environment , Asset/Value, Production/Schedule, Environment and Reputation, and Legal / Regulatory).

Application: Select highest rating of categories (For example, if Environmental impact was rated as "Low", but the Reputational impact of the same event was rated as "High" then the impact rating should be "High"):

People (Impact on Health and Safety)	<ul style="list-style-type: none"> First aid to employee(s) 	<ul style="list-style-type: none"> First aid to public Medical treatment or restricted work to employee(s) 	<ul style="list-style-type: none"> Single medical treatment to public Lost time injury or permanent partial disability to employee(s) 	<ul style="list-style-type: none"> Multiple medical treatment, disability or lost time injury to public Potential for a single fatality or permanent total disability to employee(s) 	<ul style="list-style-type: none"> Potential for fatality(ies) or permanent total disability to public Potential for multiple fatalities to employees
Environment	<ul style="list-style-type: none"> Environmental impact lasts for hours to a day Spill or release internal to facility and requires minimal clean-up or monitoring Minimal Hess response required damage <\$US100K 	<ul style="list-style-type: none"> Environmental impact lasts for days Spill or release external to facility but requires limited clean-up or monitoring Limited compensatory measures needed Hess able to negotiate and deliver response 	<ul style="list-style-type: none"> Environmental impact lasts for weeks Spill or release requires extensive clean-up Compensatory measures required 3rd party support required for response 	<ul style="list-style-type: none"> Environmental impact lasts for months Area becomes restricted and requires significant remediation Compensation required for a major part of the community Potential for multiparty remediation process and implementation support required for response 	<ul style="list-style-type: none"> Environmental impact lasts for more than a year to decades Permanent or long term contamination Requires extensive compensatory measures Potential intervention over control of remediation process and implementation support
Asset / Production / Schedule	<ul style="list-style-type: none"> Slight to minor damage to plant/equipment Impact on operations or non-productive time lasts for hours to a day Loss of production/schedule delay of hours to days No loss in revenue 	<ul style="list-style-type: none"> Minor damage Impact on operations or non-productive time lasts for days Minimal loss in revenue 	<ul style="list-style-type: none"> Significant damage Impact on parts of operations lasts for weeks Loss of production/ schedule delay of week Partial loss of revenue 	<ul style="list-style-type: none"> Major damage Delay in start-up or on-going operations over a period of months Loss of production/ schedule delay of months Loss in revenue over a period of months 	<ul style="list-style-type: none"> Extensive damage Delay in start-up or on-going operations of more than a year Loss of production/ schedule delay of more than a year Loss in revenue lasts more than a year
Reputation & Community	<ul style="list-style-type: none"> Limited negative feedback from employees and/or local stakeholders / community 	<ul style="list-style-type: none"> Negative feedback is regional, in the public domain but with limited publicity Community complaints 	<ul style="list-style-type: none"> Negative feedback is national or industry - wide Operational delays result from need to regain trust and confidence Community response required 	<ul style="list-style-type: none"> Negative feedback is global and widely publicized Business disruption lasts for months, significant effort required to rebuild relationships Ongoing community impact 	<ul style="list-style-type: none"> Intense negative feedback over an extended time is global and widely publicized Business disruption lasts for years, potential for 3rd party intervention
Legal and Regulatory	<ul style="list-style-type: none"> Internal compliance issue or local regulatory censure, low impact Local, isolated incident 	<ul style="list-style-type: none"> Regulatory censure or significant contract breach Civil action possible against company and/or management 	<ul style="list-style-type: none"> Regulatory fines Settlement orders 	<ul style="list-style-type: none"> Significant regulatory fines and/or major litigation against company and/or management but not criminal cases 	<ul style="list-style-type: none"> Possibility for Loss of License to Operate Restrictions on future work in the country Possibility for criminal fines or penalties
Value*	Slight Damage, <\$US100K	Minor Damage, \$US100K-\$US1M	Local Damage, >\$US1M-\$US10M	Major Damage, >\$US10M-\$US100M	Extensive Damage, >\$US100M-\$US1000M

*The Asset assessment values remains unchanged from previous revision of this Project Risk Matrix; Adopted from Hess's EHS&SR Risk Tolerability Recommended Practice:



APPENDIX 2

Worksheet Template & Examples



No.	Guide Word / Source of Hazard / Activity Description	Deviation / Hazard Description	Causes <i>Potential event / condition / cause that would release the hazard</i>	Consequences <i>What will happen when control is lost</i>	Safeguards <i>Protective measure put in place to prevent threats from releasing a hazard and mitigate the consequences</i>	Risk Level				Major Accident Hazard (Y/N)	Rec. No.	Recommendation	Action Party	Residual Risk			Remarks
						CC	S	L	R					S	L	R	
Paramater / Hazard Category / Activity																	
HAZOP Example - Parameter : 1. Flow																	
1.1	More	More Flow	Spurious opening of 076PCV-104 upstream flare tip.	Gas at pilot tip becomes too rich leading to potential flame instability and flame out of pilot in the worst case. Risk of continuous release of unignited gas leading to potential flash fire and explosion resulting in personnel fatalities, environmental impact and asset damage	1. TE-115/116/117 alarm will alert the operator on flame out of any of the pilot. 2. 076FIAL-105 upstream of 076PCV-104 will alert the operator. 3. Flare is designed such that unignited gas release in worst condition would lead to a safe dispersion (confirmed by modelling).	P	5	B	5B	Y	HZP-01	Ensure that an unignited gas dispersion study is carried out to demonstrate that a flammable gas cloud cannot accumulate on the platform during a combination of worst case condition (ie. flowrate and atmospheric condition) based on information given by Flare Vendor.	Contractor				
HAZID Example - Hazard Category : 1. Hydrocarbons																	
1.1	1st/2nd Stage Booster Compressor	Hydrocarbon Gas	Corrosion on pipings	Corrosion over time could lead to potential loss of hydrocarbon containment leading to jet fire/ explosion resulting in personnel fatalities, environmental impact and asset damage	1. Material selection - stainless steel 2. Integrity Management Plan 3. Fire and Gas System to initiate Emergency Shutdown (ESD) 4. Passive fire protection (firewall/ blastwall)	P	5	B	5B	Y	HZD-01	Ensure that water curtain is provided for escape route next to grid line 1 on Upper Deck, in between the Booster/ Export Compressors and piping area, to enable personnel safe escape during emergency.	Contractor				
CRA Example - Activity : 1. Coiled Tubing and Slickline Activities																	
1.1	Heavy Lifting	Overhead equipment	1. Human factor (not familiar with the job, incompetent personnel, lack of supervision) 2. Improper secure of loose items 3. Strong wind 4. Wire parted	Object hit onto the piping / tubing and can cause piping rupture that could lead to loss of containment leading to fire and explosion resulting in personnel fatalities, environmental impact and asset damage	1. Periodic maintenance of crane. 2.Crane lifting plan/approved procedures. 3. Competent Crane Operator	P	5	C	5C	Y	1 2	Ensure inspection of the lifting gears prior to lifting activity Clearance for lifting (barricade the lifting area)	Operations Operations				



APPENDIX 3

MOM ALT EHS Steering Committee Meeting (22 January 2019)



EHS Steering Committee Meeting - 22nd January 2019

#	AGENDA TOPIC	OUTCOME	ACTION PARTY
1	Previous Meetings' Action Items	(a) The Committee agreed for the action "Control of Work SWI fully embedded in the workflow at all sites" to be considered closed, on the basis that this was thoroughly tested during the 2019 Go-to-Gemba program.	Stephenson
2	2019 Go-to-Gemba : Going Forward	(a) The Committee agreed that an action should be logged into Synergi for the follow-up of opportunities identified from the Gemba visits for each member of the ALT for their respective assets/sites.	Stephenson
		(b) The Committee agreed that a thank-you note would be sent from Zhiyong to Contractors, which would include expectations to respond at the Q1 SRM .	Krishna
		(c) The Committee agreed that the follow-up of key opportunities from the Gemba visit would be reviewed at future Steering Committee sittings.	Stephenson
3	Risk Assessment Matrix	(a) The Committee supported the proposal to retain the existing values for "asset" ranking with respect to "consequence" in risk assessment - i.e. "1" is < USD100K, "2" is USD100K to USD1 Mil, "3" is >USD1 Mil to USD10 Mil, "4" is >USD10 Mil to USD100 Mil, and "5" is >USD100 Mil.	Guna
4	2019 AIP EHS Metrics	(a) The Committee agreed that a summary information pack be prepared and distributed to explain the 2019 AIP EHS Metrics, once the metrics have been finalized and approved.	Stephenson
5	CAD SIMOPS Audit	(a) The Committee took note that the draft action report had been issued by CAD and feedback was expected by 29th January 2019. Stephenson would follow up with relevant ALT members on the action parties and target deadlines end of the week.	Stephenson
6	AAR - Storm Response	(a) The Committee agreed that an engagement between the ALT and the AAR Leader be scheduled for Friday (25th Jan) at 9 am.	Stephenson
7	AOB	(a) The Committee proposed that a CBT containing key messages from Zhiyong be included in safety induction of all sites.	Krishna



APPENDIX 4

Risk Ranking SWI



Step 1 : Define your Consequence

Identify the Hazard and associated consequence. The consequence narrative is defined as the worst case credible scenario. Consequence is assessed without safeguards. The goal should be to work through to a final outcome when barriers (safeguards) fail. Final outcome must be a description of a People , Environment, Asset or Reputation (PEAR) impact. Examples of Hess NMB ' s consequence description are as below;

Do ' s

- Potential loss of containment leading to jet fire or explosion, if ignited, causing personnel injury/ fatality, environmental impact and asset damage/ production loss – HAZID
- Potential higher pumping rate into Sand Collection Tank (020-T-01A/B/C) eventually causing level buildup in tank that could cause spillover of condensate to atmosphere. Potential fire if ignited resulting to personnel injury – HAZOP
- Potential loss of hydrocarbon containment leading to fire/ explosion resulting in personnel fatalities, environmental impact and asset damage- HAZID
- Dropped objects/swing objects resulting in personnel injuries/ fatality,for personnel working within the vicinity - CRA
- Potential ineffective Corrosion Inhibitor (CI) injection due to erosion of the existing CI filming on the pipeline surface resulting in accelerated corrosion rate on the pipeline. Potential loss of hydrocarbon containment over a prolonged period. Potential fire if ignited leading to personnel impact - HAZOP
- Reserve bottle will not be automatically activated upon detection of fire (main bottles will be released automatically upon CONFIRMED detection). Potential total damage of equipment in the room – NOPRAS
- Potential swing object hitting on the PSV leading to loss of hydrocarbon containment resulting in fire/ explosion leading to personnel fatalities, environmental impact and asset damage - hazid
- Potential damage to the Open Drain Pump (077-P-01) pumping against deadhead and damaging the pump diaphragm after a prolonged unattended period due to overheating. Potential fire if ignited resulting in personnel injury.

Don't ' s

- Risk of gas blow-by from Booster Compressor Discharge Scrubber (operating pressure of 46 barg) to Condensate Surge Drum (operating pressure of 10 barg) leading to potential damage and loss of containment
- High level in T-301 resulting in diesel overflow leading to potential spillage.

Inherently Safe

- Production deferment from 1 well. Production flowline is rated to 118 barg (> SITHP of 110 barg) - No adverse HSE consequence identified
- Unable to transfer liquid from Open Drain Caisson (077-MZ-01) to Sand Collection Tank (020-V-01A/B/C). No adverse consequence since the Open Drain Caisson sizing has been checked for underflow case.
- Dropped Objects/ Swinging Load from Naga 8 damaging the wellheads/ topsides piping of WHA resulting in minor HC LOPC and structural damage. *(the basis was to stop production and blowdown the line)*

General Guidelines

1. Consequence description is written out based on all barriers failing
2. If it's a Hydrocarbon piping or pipeline any loss of containment should be further result in multiple fatalities.
3. Consequence must have a final PEAR impact description
4. If its utility fires or releases that do not involve pressurized hydrocarbon ; the final consequence description shall be by consensus of the team

Step 2 : Safeguards

The safeguard column requires specific mitigation. Generic safeguards like SOP, daily meetings, zone classification should not be repeated across all identified hazards. These safeguards will prevent the consequence from developing. Safeguard should be distinct for the hazard/causes discussed.

Do ' s

- 001-FIAL-011D provided on the production flowline to alert operator for intervention
- Soft interlock inhibits the opening of the 001-XV-102 during normal operation from BRG-CPP. 001-XV-102 can only be opened manually during an ESD
- Pressurized habitat with double layered entry and escape door
- Firewater/Monitor within coverage area on moon pool to provide heat shielding (not continuous manned)
- Escape Route Design (2x escape route from general area, as far as practicable) with temporary signage leading towards Main Deck. Once the personnel escaped to Main Deck, the Main Deck is plated, providing some shielding from event below.

Don't ' s

- SOP with checklist - manned operation carried out by competent personnel
- PM on suction strainer including periodic cleanout.
- Daily coordination meetings
- Morning Toolbox meetings

Step 3 : Severity Ranking

Based on the consequence in step 1, the team reviews and chooses the Severity/Impact Ranking based on descriptor from the risk matrix . Fundamentally this means that the severity is ranked without safeguards. Safeguards are accounted for in the likelihood assessment The severity ranking must only be based on what is defined on the consequence. The first is to decide if the impact is either P, E, A, R. At times there could be multiple types of impact described in the consequence (Step 1) e.g...leading to fatalities, environment impact and asset damage. The team shall select only one impact for ranking purposes. The selection is done In the following order of precedence P, E, A, R. (P)ersonnel safety always takes precedence over E(nvironment) issues or A(sset) damage

General Guidelines

1. (P)ersonnel safety is paramount and always considered ahead of Environment, Asset or Reputation issues during ranking
2. Multiple fatalities in the consequence description shall result in a severity of 5 (P)
3. Single fatality results in a 4 (P)
4. Most risk assessments workshops results in ranking for P, E and A. The R(eputation) impact need not be listed if team believes that would be the best way forward
5. The team must never account for safeguards while assessing consequence severity as that would mean double counting for safeguards . Safeguards are accounted for in the likelihood assessment in step 4

Step 4 : Likelihood Ranking

The team reviews the safeguards and then based on past experience determines the likelihood. The team shall use descriptors to assign the likelihood

General Guidelines

1. The teams experience though invaluable at times can be skewed based on individual view of the hazard. Its important that in the event of doubt the team shall err on the conservative while assigning the likelihood
2. For HAZOPS and HAZID , the number of independent safeguard can be counted and then mapped against the descriptors assigned in the risk matrix.

Step 5 : Risk Ranking

A combination of the (S)everity ranking and (L)ikelihood ranking results in a (R)isk Ranking. The "CC" column shall list the consequence category i.e P,E,A , R. The convention shall be to have the (S)everity listed first followed by the likelihood (e.g 4B, 3A). The risk rating is compared against the risk criteria. High risk activities shall not proceed.

General Guidelines

1. High or Intolerable Risks are unacceptable and require further review, consultation, and more detailed risk assessment to identify appropriate mitigations that reduce the risk before work can continue.
2. Medium or Requires Reduction (RR) : Risks must be reduced until they are as low as practicable. Efforts should still be made to reduce them to levels that are as low as reasonably practicable (ALARP). Further safeguards could be required
3. Low or Tolerable (T) : Risks are considered tolerable; which does not preclude the initiation of reductions if they are readily identified, and practicable. The immediately acceptable risk criteria is described as Low, this is the region of the Risk Matrix shaded in green.

Step 6 : Recommendations

Additional actions that are required to mitigate the risk further should be provided when necessary. Recommendations should be detailed and easily understandable and trackable. Recommendations shall not be modified by any individual once the team has reached a consensus and decided on it during the course of the Risk Assessment.

Step 7 : Residual Risk

Residual risk is the final Risk values considering additional mitigation measure ("Recommendation") being applied. Mostly this additional mitigation will reduce the likelihood while consequence remains as is. Consequence does not change as the number of safeguards increase because the severity is assessed and ranked without considering safeguards as described in Step 3.