
JIG

CP 4.01

Document Application: Common Process

BUSINESS RISK ASSESSMENT AND RISK MANAGEMENT FOR JOINT VENTURE OPERATIONS

CP 4.01

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Download Documents from the JIG web site (www.jointinspectiongroup.org):-

- CP 4.01 v0 051211 JIG Business Risk Assessment and Risk Management of JV Operations.doc - (this document)
- CP 4.02 v0 051211 JIG CP Management System Best Practice.xls - (contains the Business Risk Assessment Tool)
- CP 4.03 v0 051211 JIG Business Risk Assessment.ppt - (Introductory Presentation)

1 INTRODUCTION

This document describes a basic business risk assessment and risk management process which should be suitable for typical aviation fuel storage, hydrant and intoplane operations. Joint Venture participants and/or statutory authorities may require a more detailed quantitative risk assessment to be carried out for larger / more complex aviation fuelling operations.

"From the Board room down companies must ask themselves these questions: do we understand what could go wrong; do we know what our systems are to prevent this happening; and are we getting the right information to assure us they are working effectively." Kevin Myers, HSE's Deputy Chief Executive July 2010 following prosecution of companies after the Buncefield terminal explosion in the UK in December 2005:

Business risks affect the ability of a JV to deliver its business objectives. All areas of a JV's business activity should be considered to identify key business risks including: HSSE/Operations, Financial Control, People, Customer Service, Legal Compliance.

All JVs should periodically review their business risk in order to ensure they are effectively managing the key risks. When the risks are identified an action plan should then be drawn up to mitigate the risks and an appropriate monitoring programme put in place to ensure the actions remain effective.

This is effective business risk assessment and risk management and it increases the value from business decisions, because conscious choices are made in relation to risks that will have an impact on, or result from, these business decisions.

The objective of business risk management is not, therefore, arbitrarily to reduce or eliminate risk, it is to;

1. Identify risks to the achievement of the Joint Venture's objectives
2. Assess the impact and likelihood of those risks materializing;
3. Implement effective actions designed to:
 - a. Achieve business objectives;
 - b. Safeguard the JV assets from inappropriate use, loss or fraud;
 - c. Facilitate economic, effective, efficient and safe operations;
 - d. Enable compliance with the boundaries set by the JVs control framework.

2 STEPS FOR EFFECTIVE RISK ASSESSMENT AND MANAGEMENT

2.1 State clear objectives for your activities

In the planning phase of any activity, realistic and measurable objectives need to be defined in the context of the JV business environment.

Risk management is the responsibility of those who are accountable to deliver the associated JV objectives.

The identification of risks can only have value or meaning when clearly linked to the objectives of the JV.

2.2 Identify Risks (Q1: understand what could go wrong ?)

The sources of risks could be due to routine or non-routine: operational / HSSE, financial, people, customer related or legal activities. However, risks rarely originate from a single dimension and they almost never impact only one factor. For example, an accident involving injury on a JV site as a result of an operational risk impacts the individual and his/her family and the site but could also escalate to operational disruption, with possible defaults in a supply agreement, and could damage the JV reputation.

The identification of risks may result in a long list, but these may not all need to be monitored by JV management. Many of the risks are simply managed as part of day-to-day management, some risks may need to be combined because they address the same underlying issue and some may be managed at a different level in the JVs. The purpose of risk discussions at leadership team level is to identify those risks that *require specific action plans that need to be monitored by the relevant leadership team*. In order to do this effectively, a specific and precise description of the risk is required. This will enable the creation of effective actions to manage the risk.

2.3 Assess Likelihood and Impact of Risks

The assessment of Likelihood needs to take into account the track record in managing the particular risk. E.g.

Score	Likelihood	Likelihood Definition	Occurrence/Year
5	Likely	Could occur several times during over plant lifetime	> 10-2
4	Unlikely	Could occur once for every 10 to 20 similar plants over 20 to 30 years of plant lifetime	10-2 - 10-3
3	Very unlikely	<ul style="list-style-type: none"> • One time per year for at least 1000 units. • One time for every 100 to 200 similar plants in the world over 20 to 30 years of plant lifetime. • Has already occurred in the company but corrective action has been taken 	10-3 - 10-4
2	Extremely unlikely	Has already occurred in the industry but corrective action has been taken	10-4 - 10-5
1	Remote	Event physically possible but has never or seldom occurred over a period of 20 à 30 years for a large amount of sites (> few thousands, ex: wagons, process drums,...)	< 10-5

The assessment of Impact needs to take into account the immediate consequences of a risk materializing but also the knock-on effects. E.g.

Category	Human injury	Financial cost	Work	Environmental damage
5. Disaster	Multiple fatality	Significant financial loss (over \$1 m)	Major disruption to operations	Major and unstained pollution external to the site and/or extensive loss of aquatic life.
4. Very serious	Fatality	Significant financial loss (\$ 500.000 to \$ 1m)	Significant operation disruption	Important pollution with reversible environmental consequences external to the site
3. Serious	Serious injury (permanent disability, amputation)	Substantial financial loss (\$ 50.000 to \$ 500.000)	Notable operation disruption	Significant pollution external to the site
2. Substantial	Disabling injury (medical treatment)	Notable Financial loss (\$ 5.000 to \$ 50.000)	Slight operation disruption	Moderate pollution within site limits
1. Minor	First aid treatment - minor cuts bruises or burns	Negligible financial loss (up to \$ 5.000)	No effect on work	(Up to) spill or release of pollutant requiring a declaration to authorities , but without environmental consequences

2.4 Identify Level of Risk (with controls in place)

By combining the Impact and Likelihood of a risk occurring, JVs should determine whether the level of risk is acceptable to the JV management and the JV participants (shareholders).

This risk assessment process assists in allocating resources and prioritisation of actions, based on a comprehensive picture of all significant risks in the context of the objectives of the JV.

RISK = Likelihood x		LIKELIHOOD				
IMPACT		5	4	3	2	1
	5	H	H	H	M	L
	4	H	H	M	M	L
	3	H	M	M	M	L
	2	M	M	M	L	L
	1	L	L	L	L	L

Score	Risk Level	Acceptability
<= 5	Low (L)	Tolerable
> 5 & < 15	Medium (M)	Reduce risk to ALARP
>= 15	High (H)	Intolerable

2.5 Reduce Risks to Acceptable Levels by Implementing Effective Actions (Control Measures / Barriers) (Q2: know what our systems are to prevent things going wrong ?)

JVs should develop an action plan for each risk to reduce the risk to a level acceptable to the JV Management and JV participants.

- Low Risks are tolerable and may be accepted, but efforts should still be made to reduce or eliminate them if possible.
- Medium Risks - appropriate actions should be taken to reduce the risk to a level that is 'As Low As Reasonably Practicable' (ALARP). (A risk is considered 'ALARP' provided it has been reduced to the point where the benefit gained by further risk reduction is outweighed by the cost of achieving it and that generally accepted standards have been applied to the control of the risk).

- High Risks are intolerable and appropriate actions shall be taken to reduce the risk to Medium or preferably Low.

Action plans for each risk should have agreed target completion dates to reduce the risk within a timeframe acceptable to the JV Management and JV participants.

It is important not to confuse acceptability of risk with impact. A risk that has a high impact can be acceptable if adequate actions are being taken to reduce the likelihood to manage the risk to an acceptably low level and if the JV is sufficiently rewarded for the residual level of risk.

Three types of approach can be taken to manage risks:-

1. **Eliminate the hazard** (by stopping or modifying the activity)
2. **Substitute the process or hazard for a less risky one** or transferring the risk to a third party (for example to an insurance company) or by sub contracting to others (for example with contractors or joint venture partners who are better able to manage the risk at an acceptable cost). The assessment of the capabilities of contractors and their selection is therefore a key factor in managing risk. It is, of course, obvious that great care must be taken to ensure that the transfer of risk is effective both in terms of legally watertight provisions and, in many cases, the credit quality of the transferee. *If this approach is considered then the JV and participants should also consider how to manage reputational risk which may still remain with the participants regardless of legal liability.*
3. **Accept and control the risk:** Accept the risk and maintain effective strong controls/barriers (preventative and detective) to manage the risk to maximise value. Strong controls/barriers can originate from any combination of: Plant (Mobile or Fixed Equipment), Procedures or People - it is recommended to have multiple controls / barriers to reduce the likelihood of a risk occurring – the number of controls/barriers will depend on confidence in the strength of the controls and the impact of the risk that is trying to be controlled. Listed below are areas that can be considered to identify strong plant, procedure and people barriers:-
 - a. Plant (Equipment) Barriers: Design Quality, Design Standards, Quality Construction, Plant Inspections, Plant Maintenance, Protective Systems.
 - b. Procedure Barriers: Hazard Identification/Risk Assessment Procedures , Management of Change, Work Planning/ Scheduling, Operating Procedures, Control of Work (CoW), Driving Safety Standard (DSS) Controls , Communication , Contractor Oversight , Dealer Oversight , 3rd Party Compliance (Only applicable to pipeline operation) , Emergency Response.
 - c. People Barriers: Competence, Resource and Capability, Motivation, Enforcement of Standard/Practice/Procedures (SPP), Action Closure.

2.6 **Management Checks to Ensure Control Measures / Barriers Remain in Place and are Effective (Q3: are we getting the right information to assure us they are working effectively ?)**

The JV's management system and management reports should provide evidence to the JV Management and Board that the various control measures / barriers identified under the risk assessment process are being systematically checked to ensure they remain in place and effective and so provide assurance that risks are being managed.

It is recommended that JVs complete an effectiveness review very soon after any new risk reduction actions are implemented. This will allow the JV to check whether the target risk level has effectively been achieved (since there may have been planned actions that

proved to be unachievable or other steps that actually result in a lower than expected risk level).

In addition to any external audits, the JV management system should have its own internal audits /self checks at a frequency determined by the JV to ensure the identified control measures / barriers remain in place and effective e.g.

- Plant Barriers could be checked through management checking compliance with the JVs minimum Design Standards and Inspection & Maintenance System,
- Procedures could be scheduled for regular reviews by management,
- People competencies and capability could be checked through day to day management supervision and the JV's induction and refresher training programme.

Where practicable, all Plant, Procedure or People barrier defects should be reported and corrected to prevent reoccurrence.

Where Plant, Procedure or People barriers defects reoccur then they should be reported and investigated to see whether a control measure/barrier is becoming ineffective and determine appropriate corrective actions.

2.7 Monitor Risks and Communicate Changes to Risk Profile

The aggregate of the site or JV specific risks and their respective control measures can be summarized as the JV's 'Risk Profile'.

Changing business conditions and decisions made in the course of running the business will continuously alter the Risk Profile of the JV. This makes it important to have frequent and explicit conversations about risk, in order to maintain continued awareness of which risks are significant.

It also requires transparent communication of significant risk to decision makers e.g. management and the board so that decisions are made with a full understanding of the risks and opportunities involved and how these will be managed.

2.8 Report Risks

The leadership teams of Joint Ventures are recommended to review and report their risks to the board. The reporting and frequency format is left to their management team's judgment taking into consideration the size and maturity of the JV and the volatility of the risk environment. However, all JVs should demonstrate how proactive risk management has been applied as an integral part of their management activities¹.

Examples of proactive risk management by a JV's top leadership include the assessment of risks in the annual plan and discussion of the risks and actions taken to manage risks.

3 RISK ASSESSMENT TOOLS

3.1 Risk Assessment Tool Selection

A number of tools are available that can be used for risk assessment and risk management.

The attached JIG Business Risk Assessment and Risk Management Tool provides a qualitative, systematic approach to managing business risk within typical aviation storage, hydrant and into plane JV operations.

¹ Section 3.3 and 3.4 details JIG's recommended Business Risk Assessment Implementation Plan and Review Cycle.

Larger / more complex JV operations may need to employ risk assessment specialists who are capable of completing a more detailed, JV specific, quantitative risk assessment techniques to adequately demonstrate that the JV's major risks have been identified and are being adequately controlled.

3.2 Overview of JIG Business Risk Assessment Tool

The JIG Business Risk Assessment Tool is intended for use by individuals who are familiar with risk assessment and are capable with the assistance of local JV personnel of assessing the type and effectiveness of existing: plant, procedure and people control measures / barriers the JV has in place.

As illustrated in Appendix 1 the JIG Business Risk Assessment Tool systematically leads you through the business risk assessment process:-

- Q1: What could go wrong ?
- Q2: Do you know what systems are in place to prevent things going wrong ?
 - Are there additional barriers that can be introduced to further reduce the risk level (to an acceptable level) ?
- Q3: Are you getting the right information to assure yourself they are working effectively ? (Critical Checks to Ensure Controls / Barriers Remain Effective)

Appendix 2 lists the business risks (HSSE, Financial Control, People, Customer Service and Legal Compliance) that should be considered by typical aviation fuel storage, hydrant and intoplane JV operations. The list of risks and controls /barriers in the risk assessment tool can not be exhaustive so each JV should consider their JV business specific requirements in case there are other significant risks which need to be controlled.

Completion of the business risk assessment and the critical barrier checks to confirm systems remain in place should establish a strong risk management process within the JV. Business risk assessment helps prevent things going wrong and provides assurance to the JV Management Team and Board that the JV is operating within acceptable risk levels.

The business risk assessment should be reviewed when there is a significant change in the JV's activities or at least at regular intervals dictated by the JV Board to confirm that the JV continues to operate within a risk level that is acceptable to the JV Management Team and the JV Board.

3.3 Recommended JIG Business Risk Assessment Implementation Plan (2011 – 2014)

- JV to complete Business Risk Assessment facilitated by lead Participant or 3rd party (individual competent in risk assessment) – typically 1 day JV Management preparation + 1 day facilitation.
- JV Board/ Management Committee to consider risk levels and confirm they are acceptable or require additional barriers to further reduce risk to an acceptable level.
- Business Risk Assessment completion date set by JV Board/ Management Committee. Aim is for the JV to complete the Business Risk Assessment and embed it in the JV management system review process by end 2014.

3.4 Recommended JIG Business Risk Assessment Review Cycle

- JV Manager to close out any additional risk reduction actions (barriers) by agreed target date.
- JV Manager completes critical barriers checks at agreed frequency for each risk.

- JV Manager provides assurance report to JV Board/ Management Committee (copy of the Business Risk Assessment Tool) at least once annually.
- JV Manager to ensure that the Business Risk Assessment remains valid and submit to JV Board/ Management Committee to confirm operational risk levels identified remain at an acceptable level. (Annually or when JV activity significantly changes).
- Business Risk Assessment reviewed with competent individual (Participant or 3rd party) on a 3 Yearly frequency.

Appendices

Appendix 1 – JIG Business Risk Assessment Tool and Action Plan

Appendix 2 - Typical Aviation Fuel Storage, Hydrant and Intoplane JV Operations Business Risks (HSSE, Financial Control, People, Customer Service and Legal Compliance)

Appendix 3 JIG Business Risk Assessment Help Sheet - **Excel spreadsheet tool**

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APPENDIX 1 – JIG BUSINESS RISK ASSESSMENT TOOL AND ACTION PLAN

Que 1 - Do we understand what could go wrong?

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JV Business Risk Assessment Action Plan									
1. Unhide All		0. Help Sheet for Completing Risk Assessment		2c. Help Risk Scoring Guidelines		2a. Help Plant, Procedure, People: Action Guidelines			
Airport JV Name ?? Operator ?? Assessment Completed by: ?? Completed date: 09/12/10 Assessment Approved by: Board Chairman ?? Approved date: dd/mm/yy ?? Next Review Due dd/mm/yy ?? (Recommend annual review & approval)	Control Measures / Barrier Guidelines 2a1. Plant - Example Strong Barriers 2a2. Procedures - Example Strong Barriers 2a3. People - Example Strong Barriers 2a4. Mitigation Factors - Examples			Risk Ranking Likelihood score 1 Low to 5 High Impact score 1 Low to 5 High Risk = Likelihood x Impact 15 >= 15 High Risk (Unacceptable) 5 >= 5 & <15 Medium Risk (ALARP) 1-5 Low Risk Blank - Risk not yet assessed		Risk Assessment Summary 3a. Check Barriers Effective 6. Sort by Risk Ref No 7. Sort by Relative Risk		Verified Status as of 09/12/10 3c. List All Checks 3d. Overdures Only 3e. Sort by Days Overdue	
Ref No 1. Risk (What could go wrong) R02 HSSE - Depot fire - Large spill due to fixed storage loss of containment (not due to component failure)	2a. Existing Risk Control Measures / Barriers (Systems to prevent things going wrong) 0.0 Plant Barriers: - 1.1 Design Standards, - 1.2 Plant Inspections, - 1.3 Plant Maintenance, - 1.4 Protective Systems, - 1.5 Acceptable Standards checklist defined. 0.0 Procedure Barriers: - 2.1 Hazard Identification/Risk Assessment Procedures, - 2.2 Operating Procedures, - 2.3 Control of Work (CoW) 0.0 People Barriers: - 3.1 Competence - For routine activities, - 3.2 Resource and Capability, - 3.3 Motivation, - 3.4 Enforcement of Standard/Practice/Procedures (SPP) 0.0 Mitigation Factors: - 4.1 On airport fire service as first responders, - 4.2 On airport paramedics to deal with possible injuries, - 4.3 Bund drain valves locked at all times to maintain product containment within bunded area, - 4.4 Fuel Farm storage tank deluge system in place, - 4.5 Reaction and response times of emergency services regularly tested and could be on site within 3 minutes, - 4.6 On airport Fire Service hold adequate amounts of fire fighting foam to deal with fire until outside services arrive, - 4.7 Effectiveness of secondary (bunds) and tertiary containment systems.			2b. Existing 2c. Additional Risk Reduction Action(s) / Barriers Risk L x I = R 2c1. Report All Risks 2c2. Report All Actions 2c3. Report Only Outstanding Actions 1-3 Plant Maintenance - tank integrity inspection overdue. EXAMPLE Column M RED = Action overdue		2d. Risk After Actions Risk L x I = R Ops Manager 01/02/11 Enter Date Closed 2e. Action Party 2f. Target date 2g. Action Closed Date		3a. Critical Checks to Ensure Controls / Barriers Remain Effective (Assurance that systems are in place and remain effective) - Review the Site Specific Task Breakdown (SSTB) for the high and high high level alarm and shut off test for at least one tank. - Carry out a Task Observation of the functionality test being carried out on at least one tank to ensure that the test is carried out correctly and in line with the SSTB. - Check high level alarms and shut off valve inspection and maintenance records to ensure that all devices related to tank overfill prevention have been tested within the required period. - Check the training records for all staff that have this task listed in their Job Task Assessment to ensure their training is up to date.	
								3b. Check Barriers Effective 3c. List All Checks 3d. Overdures Only 3e. Sort by Days Overdue MAR	

Business Risk (HSSE, Financial, People, Customer Service, Legal Compliance).

Business Risk marked MAR if a Major Accident Risk.

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Que 2 - Do we know what our systems are to prevent this happening?

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JV Business Risk Assessment Action Plan									
1. Unhide All		0. Help Sheet for Completing Risk Assessment		2c. Help Risk Scoring Guidelines		2a. Help Plant, Procedure, People: Action Guidelines			
Airport JV Name ?? Operator ?? Assessment Completed by: ?? Completed date: 09/12/10 Assessment Approved by: Board Chairman ?? Approved date: dd/mm/yy ?? Next Review Due dd/mm/yy ?? (Recommend annual review & approval)	Control Measures / Barrier Guidelines 2a1. Plant - Example Strong Barriers 2a2. Procedures - Example Strong Barriers 2a3. People - Example Strong Barriers 2a4. Mitigation Factors - Examples			Risk Ranking Likelihood score 1 Low to 5 High Impact score 1 Low to 5 High Risk = Likelihood x Impact 15 >= 15 High Risk (Unacceptable) 5 >= 5 & <15 Medium Risk (ALARP) 1-5 Low Risk Blank - Risk not yet assessed		Risk Assessment Summary 3a. Check Barriers Effective 6. Sort by Risk Ref No 7. Sort by Relative Risk		Verified Status as of 09/12/10 3c. List All Checks 3d. Overdures Only 3e. Sort by Days Overdue	
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								3b. Check Barriers Effective 3c. List All Checks 3d. Overdures Only 3e. Sort by Days Overdue MAR	

Current existing strong barriers: Plant, Procedures, People.
Mitigating measures to reduce risk impact.

Current risk level with existing strong barriers.

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2c Are there additional barriers we can introduce to reduce risk further ?

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JV Business Risk Assessment Action Plan																		
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Airport JV Name ?? Operator ?? Assessment Completed by: ?? Completed date: 09/12/10 Assessment Approved by: Board Chairman ?? Approved date: dd/mm/yy ?? Next Review Due dd/mm/yy ?? (Recommend annual review & approval)		Control Measures / Barrier Guidelines 2a1. Plant - Example Strong Barriers 2a2. Procedures - Example Strong Barriers 2a3. People - Example Strong Barriers 2a4. Mitigation Factors - Examples		Risk Ranking Likelihood score 1 Low to 5 High Impact score 1 Low to 5 High Risk = Likelihood x Impact M = 15 High Risk (Unacceptable) M = 5 & <15 Medium Risk (ALARP) 1-5 Low Risk Blank - Risk not yet assessed		Risk Assessment Summary 3a. Check Barriers Effective 6. Sort by Risk Ref No 7. Sort by Relative Risk		Verified Status 3b. List All Checks 3c. Overdue Only 3d. Sort by Days Overdue										
Ref No	1. Risk (What could go wrong)	2a. Existing Risk Control Measures / Barriers (Systems to prevent things going wrong)	2b. Existing Risk Reduction Action(s) / Barriers	2c. Risk After Actions	2d. Action Party	2e. Target date	2f. Action Closed Date	3a. Critical Checks to Ensure Controls / Barriers Remain Effective (Assurance that systems are in place and remain effective)	3b. Freq (Months)	3c. Last Verified	3d. Overdue Days							
002	HSSE - Depot fire - Large spills due to fixed storage loss of containment (not due to component failure)	1.0 Plant Barriers: - 1.1 Design Standards, - 1.2 Plant Inspections, - 1.3 Plant Maintenance, - 1.4 Protective Systems, - 1.5 Acceptable Standards checklist defined. 2.0 Procedure Barriers: - 2.1 Hazard Identification/Risk Assessment Procedures, - 2.2 Operating Procedures, - 2.3 Control of Work (CoW) 3.0 People Barriers: - 3.1 Competence - For routine activities, - 3.2 Resource and Capability, - 3.3 Motivation, - 3.4 Enforcement of Standard/Practice/Procedures (SPP) 4.0 Mitigation Factors: - 4.1 On airport fire service as first responders, - 4.2 On airport paramedics to deal with possible injuries, - 4.3 Bund drain valves locked at all times to maintain product containment within bunded area, - 4.4 Fuel Farm storage tank deluge system in place, - 4.5 Reaction and response times of emergency services regularly tested and could be on site within 3 minutes, - 4.6 On airport Fire Service hold adequate amounts of fire fighting foam to deal with fire until outside services arrive, - 4.7 Effectiveness of secondary (bunds) and tertiary containment systems.	2b. Existing Risk Reduction Action(s) / Barriers 2c1. Report All Risks 2c2. Report All Actions 2c3. Report Only Outstanding Actions EXAMPLE Column M RED = Action overdue	2	4	8	1.3 Plant Maintenance - tank integrity inspection overdue.	2	4	8	Ops Manager	01/02/11	Enter Date Closed	Review the Site Specific Task Breakdown (SSTB) for the high and high level alarm and shut off test for at least one tank. Carry out a Task Observation of the functionality test being carried out on at least one tank to ensure that the test is carried out correctly and in line with the SSTB. Check high level alarms and shut off valve inspection and maintenance records to ensure that all devices related to tank overfill prevention have been tested within the required period. Check the training records for all staff that have this task listed in their Job Task Assessment to ensure their training is up to date.	3	01/10/10	-21	MAR

Additional (or missing) barriers introduced to further reduce risk to acceptable level.

Resultant acceptable risk level with all barriers and additional barriers in place and effective.

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Que 3 Are we getting the right information to assure us they are working effectively ?

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JV Business Risk Assessment Action Plan																		
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Airport JV Name ?? Operator ?? Assessment Completed by: ?? Completed date: 09/12/10 Assessment Approved by: Board Chairman ?? Approved date: dd/mm/yy ?? Next Review Due dd/mm/yy ?? (Recommend annual review & approval)		Control Measures / Barrier Guidelines 2a1. Plant - Example Strong Barriers 2a2. Procedures - Example Strong Barriers 2a3. People - Example Strong Barriers 2a4. Mitigation Factors - Examples		Risk Ranking Likelihood score 1 Low to 5 High Impact score 1 Low to 5 High Risk = Likelihood x Impact M = 15 High Risk (Unacceptable) M = 5 & <15 Medium Risk (ALARP) 1-5 Low Risk Blank - Risk not yet assessed		Risk Assessment Summary 3a. Check Barriers Effective 6. Sort by Risk Ref No 7. Sort by Relative Risk		Verified Status 3b. List All Checks 3c. Overdue Only 3d. Sort by Days Overdue										
Ref No	1. Risk (What could go wrong)	2a. Existing Risk Control Measures / Barriers (Systems to prevent things going wrong)	2b. Existing Risk Reduction Action(s) / Barriers	2c. Risk After Actions	2d. Action Party	2e. Target date	2f. Action Closed Date	3a. Critical Checks to Ensure Controls / Barriers Remain Effective (Assurance that systems are in place and remain effective)	3b. Freq (Months)	3c. Last Verified	3d. Overdue Days							
002	HSSE - Depot fire - Large spills due to fixed storage loss of containment (not due to component failure)	1.0 Plant Barriers: - 1.1 Design Standards, - 1.2 Plant Inspections, - 1.3 Plant Maintenance, - 1.4 Protective Systems, - 1.5 Acceptable Standards checklist defined. 2.0 Procedure Barriers: - 2.1 Hazard Identification/Risk Assessment Procedures, - 2.2 Operating Procedures, - 2.3 Control of Work (CoW) 3.0 People Barriers: - 3.1 Competence - For routine activities, - 3.2 Resource and Capability, - 3.3 Motivation, - 3.4 Enforcement of Standard/Practice/Procedures (SPP) 4.0 Mitigation Factors: - 4.1 On airport fire service as first responders, - 4.2 On airport paramedics to deal with possible injuries, - 4.3 Bund drain valves locked at all times to maintain product containment within bunded area, - 4.4 Fuel Farm storage tank deluge system in place, - 4.5 Reaction and response times of emergency services regularly tested and could be on site within 3 minutes, - 4.6 On airport Fire Service hold adequate amounts of fire fighting foam to deal with fire until outside services arrive, - 4.7 Effectiveness of secondary (bunds) and tertiary containment systems.	2b. Existing Risk Reduction Action(s) / Barriers 2c1. Report All Risks 2c2. Report All Actions 2c3. Report Only Outstanding Actions EXAMPLE Column M RED = Action overdue	2	4	8	1.3 Plant Maintenance - tank integrity inspection overdue.	2	4	8	Ops Manager	01/02/11	Enter Date Closed	Review the Site Specific Task Breakdown (SSTB) for the high and high level alarm and shut off test for at least one tank. Carry out a Task Observation of the functionality test being carried out on at least one tank to ensure that the test is carried out correctly and in line with the SSTB. Check high level alarms and shut off valve inspection and maintenance records to ensure that all devices related to tank overfill prevention have been tested within the required period. Check the training records for all staff that have this task listed in their Job Task Assessment to ensure their training is up to date.	3	01/10/10	-21	MAR

Critical barrier checks completed by site manager at agreed frequency to provide assurance to self and JV Board that systems we think are in place are in place and effective.

CP 4 01 v0 260511 JIG Business Risk Assessment.ppt

26th May 2011

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APPENDIX 2 - TYPICAL AVIATION FUEL STORAGE, HYDRANT AND INTOPLANE JV OPERATIONS BUSINESS RISKS (HSSE, FINANCIAL CONTROL, PEOPLE, CUSTOMER SERVICE AND LEGAL COMPLIANCE)

NB. The list of risks can not be exhaustive so each JV should consider their JV business specific requirements in case there are other significant risks which need to be controlled.

Ref No	1. Risk (What could go wrong)
R01.0	HSSE - Crisis Management - Emergency Response including Pandemic Response Plan (PRP) / Business Continuity Plan (BCP) e.g. product quality incident at an international airport resulting in grounding of planes.
R02.0	HSSE - Aircraft Incident - Fire - Pressurised fuelling vehicle hose end/ aircraft adaptor parting from each other during fuelling leading to an uncontained pressurised release of fuel, which then could be ignited potentially leading to multiple injuries/fatalities. Industry standards have been raised significantly after the Denver Fire incident.
R03.0	HSSE - Aircraft Incident - Fire resulting from ignition of wing vent spill from pressurised refuelling of aircraft. Does not include overwing refuellings. Generally, fuelling operator does not have control of the events leading to a wing vent spill, or the control of ignition sources.
R04.0	HSSE - Aircraft Incident - Fire resulting from the ignition of jet fuel released under pressure from the failure of a component in the hydrant pit valve to refuelling vehicle system e.g. hydrant pit valve, pit valve coupler, hoses, and connections.
R05.0	HSSE - Aircraft Incident - Fire with fatalities as a result of refuelling vehicle hitting plane wing, drive away incident or vehicle to vehicle collision releasing product which then ignites and affects the aircraft
R06.0	HSSE - Aircraft Incident - Product Quality - Contaminated fuel delivered to aircraft causes in-flight engine failure and crash. Avgas contamination identified as a significant MAR risk (due to vulnerability of piston engine technology) but this scenario extended to include jet fuel contamination which is also a MAR risk but considered to be well controlled and therefore less of a risk than avgas contamination. This risk assessment is based on the avgas contamination risk only. Many of the controls are common between avgas and jet. Excludes FSII and water slugs which are considered separately.
R07.0	HSSE - Aircraft Incident - Product Quality - Engine failure due to fuel starvation as a result of (i) blockage/restriction of aircraft fuel system due to : ice, particulate, microbiological debris, cold flow property of fuel (e.g. contamination with diesel fuel), (ii) slug of water from aircraft fuel tanks (due to poor aircraft maintenance or water delivered from fuelling vehicle), (iii) vapour locked fuel system due to contamination with high vapour pressure products (e.g. gasoline / petrol).
R08.0	HSSE - Aircraft Incident - Product Quality - Lack of FSII allows water to freeze resulting in fuel starvation and engine failure. Note for most military contracts supplier may not be required to inject FSII, this scenario reflects the occasional times that supplier is contractually required to inject FSII at point of delivery. NB. Military use limits permit concentration of 0.07 to 0.20 % by volume.
R09.0	HSSE - Aircraft Incident - Product Quality - Misfuelling - Delivery of Jet fuel to a spark ignition piston engine plane or Avgas to a compression ignition engine plane can lead to engine failure and Aircraft Incident. Usually limited to General Aviation aircraft carrying less than 10 passengers.
R10.0	HSSE - Depot fire - Large spills due to fixed storage loss of containment (not due to component failure)
R11.0	HSSE - Depot Fire - Large Spills within a depot from recovery tank overfills, sampling valves left open resulting in a fire. Although the initial fire may be small it could affect the surrounding facilities.

Ref No	1. Risk (What could go wrong)
R12.0	HSSE - Depot Fire - Large Spills within a depot from vehicle overfill, vehicle rollover, vehicle collision resulting in a fire
R13.0	HSSE - Depot Fire - Spills due to component failure e.g. hose/fitting/gasket failure, filter vessels, corroded pipework resulting in a fire. Loading Island at FFD.
R14.0	HSSE - Environmental risk - Discharge of hydrocarbon to public drain
R15.0	HSSE - Environmental risk - Leak from underground tanks
R16.0	HSSE - Environmental risk - Leaks from hydrants
R17.0	HSSE - Environmental risk - Leaks from over ground tanks
R18.0	HSSE - Environmental risk - Overfill during filling of tanks
R19.0	HSSE - Environmental risk - Spill during discharge or filling of vehicles
R20.0	HSSE - Fire/Spill - Cross country pipeline loss of containment leading to an environmental incident or fire.
R21.0	HSSE - Personal Injuries - usually to a single individual resulting from a slip, trip or fall including from a working at height position. Injuries can range from bruising, grazing to potential fatality from working at height. Note - This risk covers routine activities - non routine project engineering working at height issues are addressed separately.
R22.0	HSSE - Personal Injuries, Spills, Fire and Equipment Damage caused by Non Routine Activities
R23.1	HSSE - Personal injury - Driving - Potential for fatalities arising from driving of company vehicles through own employees as part of the into plane service.
R23.2	HSSE - Personal injury - Driving - Potential for serious incident arising from company controlled road bridging activities (by company employees or contracted to 3rd parties).
R24.0	HSSE - Personal Injury / Health - Exposures (asbestos, benzene, lead etc.) - usually to single individual resulting from a high occupational exposure of hydrocarbons e.g. constant exposure during fuelling at an airport. Or physical injury caused whilst travelling e.g. back injury, disease
R25.0	HSSE - Personal injury caused by Manual Handling - usually to single individual resulting from lifting/moving an object(s) using poor technique.
R26.0	HSSE - Security - unauthorised use of JV facilities (e.g. by terrorists) . This would have a significant adverse public reaction to JV and participants. The major risk is considered to be reputational. Note that the main examples are using JV depot to access airside on a one off basis and using a 'sleeper' member of the work force to commit a terrorist act either directly or part of a larger conspiracy.
R27.0	Customer Service - Operational disruption - Major breakdown due to maintenance issues
R28.0	Customer Service - Operational disruption due to Poor HSSE performance of Operator or failure of Airport facility to meet minimum HSSE standards of at least one partner
R29.0	Customer Service - Operational disruptions due to Operational and Mgt constraints e.g. insufficient personnel, equipment resources.

Ref No	1. Risk (What could go wrong)
R30.0	Customer Service - Operational disruptions of services due to incidents/accidents within Airport facility or neighbouring facilities
R31.0	Customer Service - Operational disruption due to security of supply (e.g. Stock Out due to scheduling problems or insufficient storage capacity)
R32.0	Financial Control - Bank Account Fraud
R33.0	Financial Control - High Operational Stock losses
R34.0	Financial Control - operational budget overspend control
R35.0	Financial Control - capital budget overspend control
R36.0	Financial Control - cash flow control / dividend payments
R37.0	Financial Control - Theft of Assets
R38.0	Financial Control - Theft of Cash
R39.0	Financial Control - Theft of Stock
R40.0	Legal Compliance - HSE Legislation - non compliance. JV may not be complying with local legislation which could result in the termination of the licence to operate with positional reputational exposure
R41.0	Legal Compliance - Competition Law non compliance - resulting in fines, claims and reputational impact.
R42.0	Legal Compliance - Business Principles - Anti-Bribery & Corruption, Money Laundering non compliance - fines
R43.0	Legal Compliance - Adherence to JV Agreements e.g. Incorrect Allocation of Costs
R44.0	Legal Compliance - Financial Loss - Employee Claims

APPENDIX 3 JIG BUSINESS RISK ASSESSMENT – HELP SHEET - EXCEL SPREADSHEET TOOL

Help - JV Business Risk Assessment and Action Plan Completion Guide

Ref No	1. Risk (What could go wrong)	2a. Existing Risk Control Measures / Barriers (Systems to prevent things going wrong)	2b. Existing Risk L x I = R	2c. Additional Risk Reduction Action(s) / Barriers	2d. Risk After Actions L x I = R	2e. Action Party	2f. Target date	2g. Action Closed Date	3a. Checks to Ensure Actions / Barriers Remain Effective	3b. Freq (Months)	3c. Last Verified	3d. Overdue Days	MAR
				<div>2c1. Report All Risks</div> <div>2c2. Report All Actions</div> <div>2c3. Report Only Outstanding Actions</div>									
R02.0	HSSE - Depot fire - Large spills due to fixed storage loss of containment (not due to component failure)	1.0 Plant Barriers: • 1.1 Design Standards, • 1.2 Plant Inspections, • 1.3 Plant Maintenance, • 1.4 Protective Systems, • 1.5 Acceptable Standards checklist defined. 2.0 Procedure Barriers: • 2.1 Hazard Identification/Risk Assessment Procedures , • 2.2 Operating Procedures , • 2.3 Control of Work (CoW) 3.0 People Barriers: • 3.1 Competence - For routine activities, • 3.2 Resource and Capability , • 3.3 Motivation , • 3.4 Enforcement of Standard/Practice/Procedures (SPP) 4.0 Mitigation Factors. • 4.1 On airport fire service as first responders. • 4.2 On airport paramedics to deal with possible injuries. • 4.3 Bund drain valves locked at all times to maintain product containment within bunded area. • 4.4 Fuel Farm storage tank deluge system in place.	2 4 8	1.3 Plant Maintenance - tank integrity inspection overdue. EXAMPLE Column M RED = Action overdue	2 4 8	Ops Manager	01/02/11	Enter Date Closed dd/mm/yy	• Review the Site Specific Task Breakdown (SSTB) for the high and high level alarm and shut off test for at least one tank. • Carry out a Task Observation of the functionality test being carried out on at least one tank to ensure that the test is carried out correctly and in line with the SSTB. • Check high level alarms and shut off valve inspection and maintenance records to ensure that all devices related to tank overfill prevention have been tested within the required period. • Check the training records for all staff that have this task listed in their Job Task Assessment to ensure their training is up to date.	3	01/10/10	-21	MAR

Completion Steps

Step 1. - Identify JV's Business Risks (HSSE, Financial Control, People, Customer Service, Legal Compliance) - typical risks shown for storage & intoplane JV operations

Step 2a. - List existing strong plant, procedure and people control measures / barriers to control risk. Recommend you use strike through text formats for recommended barriers that are not currently in place.

Step 2b. - Assess likelihood and impact to determine level of risk with existing control barriers / mitigation measures in place - should be at least ALARP but preferably as low as possible.

Step 2c. - Additional Risk Reduction Actions (New or improved barriers to further reduce risk to at least ALARP - recommended actions are a combination of Plant, Procedures and People Barriers. Example mitigation actions / barriers shown - to be reviewed to suit JV's own requirements.

Step 2d. – Reassess likelihood and impact to determine level of risk with additional risk reduction actions in place – should be at least ALARP but preferably as low as possible.

Step 2e. – Identify person responsible for putting additional risk reduction actions in place.

Step 2f. – Target date for having additional risk reduction actions in place.

Step 2g. – Monitor risk reduction actions until closed.

Step 3a. – What checking / reporting process does the JV have in place to ensure all control barriers / mitigation measures remain in place.

Step 3b. – At what frequency will critical barriers identified in 3a be checked

Step 3c. – Date checks last completed.

Step 3d. – Days Overdue Status (+ve number indicates check is overdue)

BUSINESS RISK ASSESSMENT AND RISK MANAGEMENT FOR JOINT VENTURE OPERATIONS

JV Business Risk Assessment Action Plan														
8. Unhide All		0. Help Sheet for Completing Risk Assessment		2c. Help Risk Scoring Guidelines		2a. Help Plant, Procedure, People: Action Guidelines								
Airport JV Name Operator Assessment Completed by: Completed date: Assessment Approved by: Approved date: Next Review Due		Control Measures / Barrier Guidelines 2a1. Plant - Example Strong Barriers 2a2. Procedures - Example Strong Barriers 2a3. People - Example Strong Barriers 2a4. Mitigation Factors - Examples		Risk Ranking Likelihood score 1 Low to 5 High Impact score 1 Low to 5 High Risk = Likelihood x Impact H >= 15 High Risk (Unacceptable) M >5 & <15 Medium Risk (ALARP) L 1-5 Low Risk Blank - Risk not yet assessed		Risk Assessment Summary 3a. Check Barriers Effective 6. Sort by Risk Ref No 7. Sort by Relative Risk		Verified Status as @ 10/12/10 3c. List All Checks 3d. Overdues Only 3e. Sort by Days Overdue						
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Tool Button Functionality

Button 2a. Guidelines for identifying strong: plant, procedure, people barriers.

Button 2a1. Shows example strong barriers for Plant

Button 2a2. Shows example strong barriers for Procedures

Button 2a3. Shows example strong barriers for People

Button 2c. Help Sheet for Risk Scoring Guidelines (select preferred Likelihood/Impact Risk Model - Oil Co Operated JV likely to want to use their own company definitions)

Button 2c1. Action Plan Summary report of all risk and all additional actions.

Button 2c2. Action Plan Summary Report showing only additional actions.

Button 2c3. Action Plan Summary Report showing only outstanding actions.

Button 3a. Shows Checks to ensure barriers are in place and remain effective

Button 3c. Lists all risks and checks

Button 3d. Lists risks with overdue checks only

Button 3e. Sorts list by overdue days

Button 6. Sorts list by risk reference number

Button 7. Sorts list by relative risk ranking

Button 8. Un-hides all rows and columns.