

RPS Energy

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# BowTieXP Sample Report Library

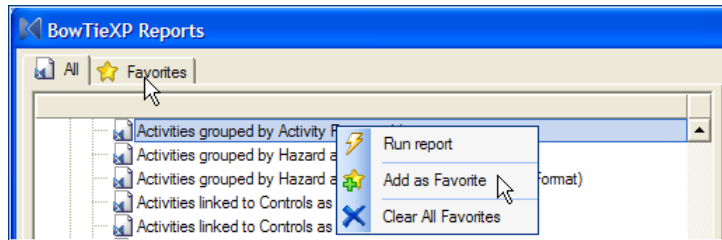
## To Software V. 3.6.4

Please note that these report samples are created with limited data, and are designed only to give a simple overview. Some of the report samples are incomplete – and are noted “(UNFIN)”.

Note this has Black and Advanced Reports listed, which may not be available in your software edition.

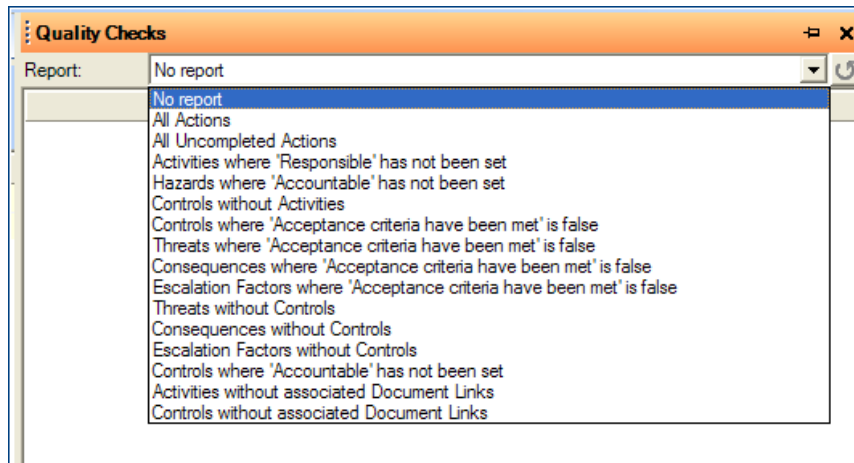
### Favourites

Note that reports can be added as “Favourites” by right-clicking the report and choosing Add as Favourite. It will then be found on the Favourites tab on the Reports screen.

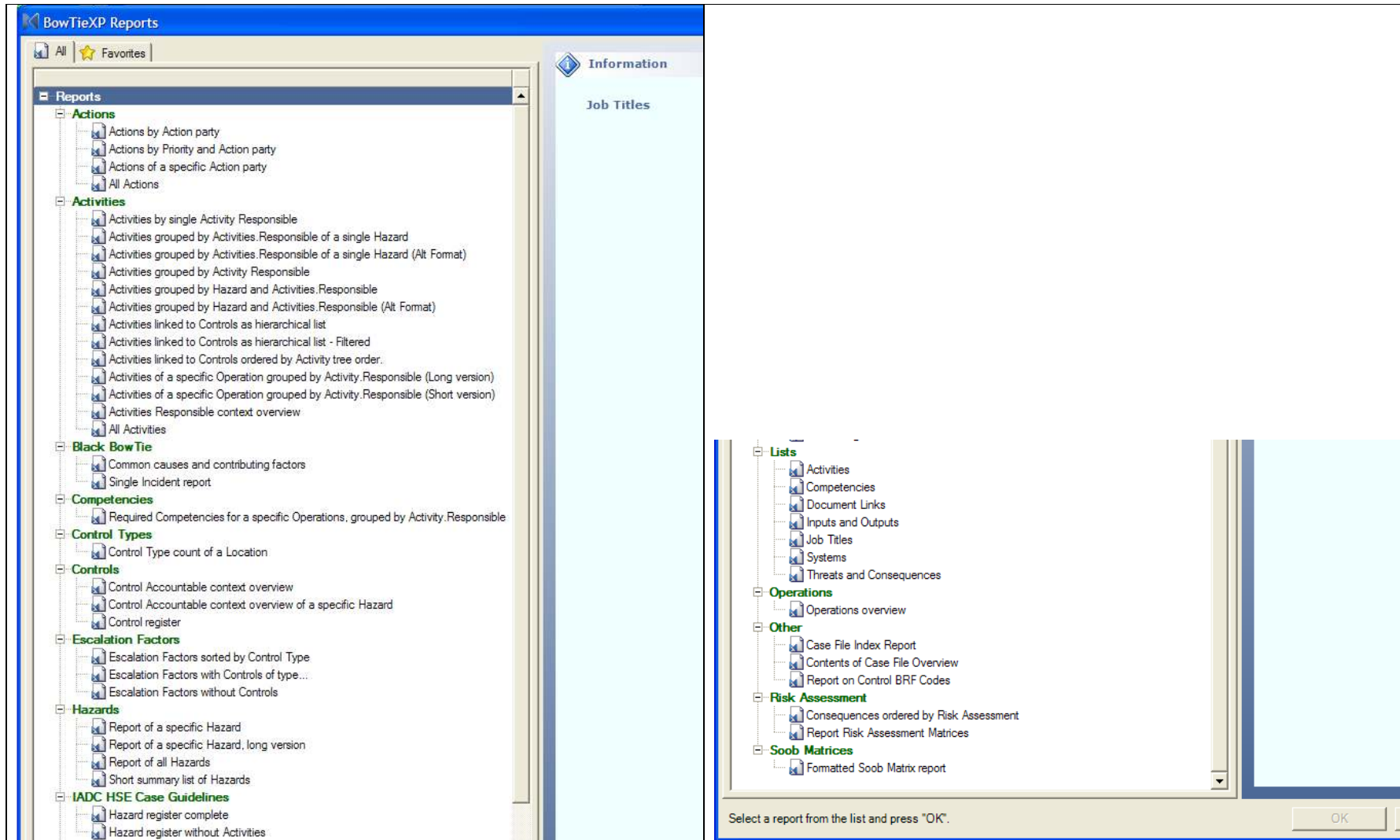


### Quality Checks Menu

This function provides an on-screen display only.



## Reports Menu (Including Advanced and Black Editions)



## Report Overview – to V. 3.6.4

This table lists the reports by columns for Editions. E.g. for Advanced Edition reports, see the second column.

1) STANDARD Edition	2) ADVANCED Edition	3) BLACK Edition
<p>Report</p> <ul style="list-style-type: none"> <li>[-] Reports <ul style="list-style-type: none"> <li>+ Actions</li> <li>+ Activities</li> <li>+ Control Types</li> <li>+ Controls</li> <li>+ Escalation Factors</li> <li>+ Hazards</li> <li>+ Lists</li> <li>+ Other</li> <li>+ Risk Assessment</li> </ul> </li> </ul>	<p>Report</p> <ul style="list-style-type: none"> <li>[-] Reports <ul style="list-style-type: none"> <li>+ Actions</li> <li>+ Activities</li> <li>+ Barrier Types</li> <li>+ Barriers</li> <li>+ Black BowTie</li> <li>+ Competencies</li> <li>+ Defeating Factors</li> <li>+ Hazards</li> <li>+ IADC HSE Case Guidelines</li> <li>+ Lists</li> <li>+ Operations</li> <li>+ Other</li> <li>+ Risk Assessment</li> </ul> </li> </ul>	<p>Report</p> <ul style="list-style-type: none"> <li>[-] Reports <ul style="list-style-type: none"> <li>+ Actions</li> <li>+ Activities</li> <li>+ Black BowTie</li> <li>+ Control Types</li> <li>+ Controls</li> <li>+ Escalation Factors</li> <li>+ Hazards</li> <li>+ Lists</li> <li>+ Other</li> <li>+ Risk Assessment</li> </ul> </li> </ul>
<p><b>Section Standard - A</b></p> <p><b>Actions</b></p> <ol style="list-style-type: none"> <li>1. Actions by Action party</li> <li>2. Actions by Priority and Action party</li> <li>3. Actions of a specific Action party</li> <li>4. All Actions</li> </ol>	<p>Refer Standard</p>	<p>Refer Standard</p>
<p><b>Section Standard - B</b></p> <p><b>Activities</b></p> <ol style="list-style-type: none"> <li>1. Activities by single Activity Responsible</li> <li>2. Activities grouped by Activities Responsible of a single Hazard</li> <li>3. Activities grouped by Activities Responsible of a single Hazard (Alternate format)</li> <li>4. Activities grouped by Activity Responsible</li> <li>5. Activities grouped by Hazard and Activities Responsible</li> <li>6. Activities grouped by Hazard and Activities</li> </ol>	<p><b>Section Advanced - B</b></p>	<p>Refer Standard</p>

Responsible (Alternate format) 7. Activities linked to Controls as hierarchical list 8. Activities linked to Controls as hierarchical list – Filtered 9. Activities linked to Controls ordered by Activity tree order <i>(See Advanced column at right for 10 &amp; 11)</i> 12. Activities Responsible context overview 13. All Activities	<b>Activities</b> 10. Activities of a specific Operation grouped by Activity Responsible (Long version) 11. Activities of a specific Operation grouped by Activity Responsible (Short version)	
<b>Section Standard - C</b> <b>Control Types</b> 1. Control Type count of a Location	<b>Section Advanced - C</b> <b>Barrier Types</b> 1. Barrier Type count of a Location	Refer Standard
<b>Section Standard - D</b> <b>Controls</b> 1. Control Accountable content overview 2. Control Accountable content overview of a specific Hazard 3. Control register	<b>Section Advanced - D</b> <b>Barriers</b> 1. Barrier register 2. Barrier Responsible content overview 3. Barrier Responsible content overview of a specific Hazard	Refer Standard
		<b>Section Black - E</b> <b>Black BowTie:</b> 1. Common Causes and contributing factors 2. Single Incident report
	1.	
	<b>Section Advanced - F</b> <b>Competencies</b> 1. Required Competencies for a specific Operations, grouped by Activities	
<b>Section Standard - G</b> <b>Escalation Factors</b> 1. Escalation Factors sorted by Control Type 2. Escalation Factors with Controls of type... 3. Escalation Factors without Controls	<b>Section Advanced - G</b> <b>Defeating Factors</b> 1. Defeating Factors sorted by Barrier Type 2. Defeating Factors with Barriers of type... 3. Defeating Factors without Barriers	Refer Standard

<b>Section Standard - H</b>		
<b>Hazards</b> <ol style="list-style-type: none"> <li>1. Report of a specific Hazard</li> <li>2. Report of all Hazards</li> <li>3. Short summary list of Hazards</li> </ol>	Refer Standard	Refer Standard
	<b>Section Advanced - I</b> <b>IADC HSE Case Guidelines</b> <ol style="list-style-type: none"> <li>1. Hazard register complete</li> <li>2. Hazard register without Activities</li> </ol>	
<b>Section Standard - J</b>		
<b>Lists</b> <ol style="list-style-type: none"> <li>1. Activities</li> <li>2. Competencies</li> <li>3. Document Links</li> <li>4. Inputs and Outputs</li> <li>5. Job Titles</li> <li>6. Systems</li> <li>7. Threats and Consequences</li> </ol>	Refer Standard	Refer Standard
	<b>Section Advanced - K</b> <b>Operations</b> <ol style="list-style-type: none"> <li>1. Operations overview</li> </ol>	
<b>Section Standard - L</b>		
<b>Other</b> <ol style="list-style-type: none"> <li>1. Case File index Report</li> <li>2. Contents of Case File overview</li> <li>3. Report on Control BRF Codes</li> </ol>	Refer Standard	Refer Standard
<b>Section Standard - M</b>		
<b>Risk Assessment</b> <ol style="list-style-type: none"> <li>1. Consequences ordered by Risk Assessment</li> <li>2. Report Risk Assessment Matrices</li> </ol>	Refer Standard	Refer Standard

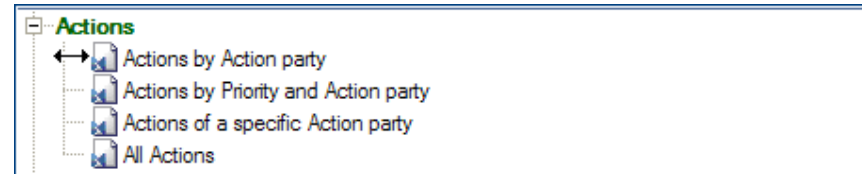
## STANDARD REPORTS – DETAIL

It can be assumed that all of the STANDARD reports appear in the Advanced and Black editions of BowTieXP.

## Section A

### Section A: Actions

#### Report 1: Actions by Action Party



## Report: All Actions sorted by Action party

Case: 'Simple sample Black BowTieXP file based on Test File (v325 and later)'

### CSF Corporate Support Function

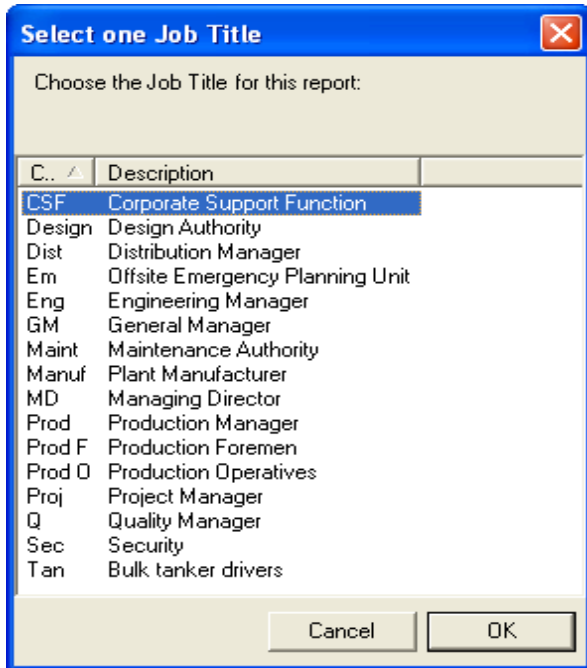
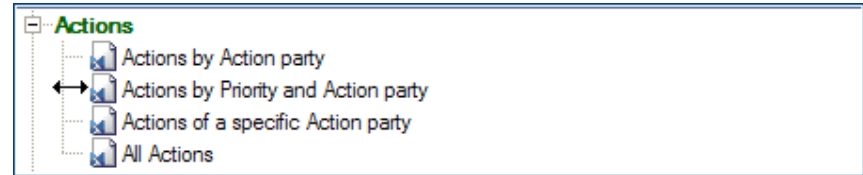
Review containment Querying how contained will be effected			
Target		Priority	
Action party	CSF Corporate Support Function	Completed	No
Path: (LOC.) Hazardous Site (HAZ.) 5.4.4.1 Heating Chemicals in the Catalyser Heater / Overheated Catalyser (CONS.) Enhanced combustion within gas cloud (contained onsite) (ACTN.) Review containment Querying how contained will be effected			

### Design Design Authority

Require temp threshold Require temp threshold			
Target		Priority	
Action party	Design Design Authority	Completed	No
Path: (LOC.) Hazardous Site (HAZ.) 5.4.4.1 Heating Chemicals in the Catalyser Heater / Overheated Catalyser (CONS.) Enhanced combustion within gas cloud (contained onsite) (CTL.) Evacuation of worksite on indication of temperature runaway (ACTN.) Require temp threshold Require temp threshold			

**Section A: Actions**

**Report 2: Actions by Priority and Action Party**



## All Actions sorted by Priority and Action party

Case: 'Simple sample Black BowTieXP file based on Test File (v325 and later)'

### Priority 1 - Urgent

Review Review Control			
Control needs Escalation Factor attached			
Target		Priority	Priority 1 - Urgent
Action party	CSF Corporate Support Function	Completed	No
Path: (LOC.) Hazardous Site (HAZ.) 5.4.4.1 Heating Chemicals in the Catalyser Heater / Overheated Catalyser (THT.) Inadequate design of plant (CTL.) Main elements of plant designed by reputable provider of Chemical catalyser systems (ACTN.) Review Review Control			

### Priority 2 - ASAP

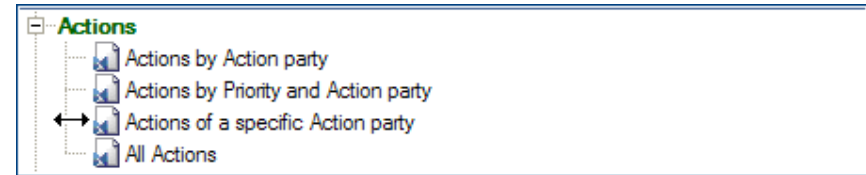
Review containment Querying how contained will be effected			
Target		Priority	Priority 2 - ASAP
Action party	CSF Corporate Support Function	Completed	No
Path: (LOC.) Hazardous Site (HAZ.) 5.4.4.1 Heating Chemicals in the Catalyser Heater / Overheated Catalyser (CONS.) Enhanced combustion within gas cloud (contained onsite) (ACTN.) Review containment Querying how contained will be effected			

### Priority 3 - 1 Month

Require temp threshold Require temp threshold			
Require temp threshold			
Target		Priority	Priority 3 - 1 Month
Action party	Design Design Authority	Completed	No
Path: (LOC.) Hazardous Site (HAZ.) 5.4.4.1 Heating Chemicals in the Catalyser Heater / Overheated Catalyser (CONS.) Enhanced combustion within gas cloud (contained onsite) (CTL.) Evacuation of worksite on indication of temperature runaway (ACTN.) Require temp threshold Require temp threshold			

**Section A: Actions**

**Report 3: Actions of a Specific Action Party**



Select one Job Title

Choose the Job Title for this report:

Filter:

Code	Description
CSF	Corporate Support Function
Design	Design Authority
Dist	Distribution Manager
Em	Offsite Emergency Planning Unit
Eng	Engineering Manager
GM	General Manager
Maint	Maintenance Authority
Manuf	Plant Manufacturer
MD	Managing Director
Prod F	Production Foremen
Prod O	Production Operatives

Cancel OK

## All Actions with 'Corporate Support Function' as Action party sorted by Priority

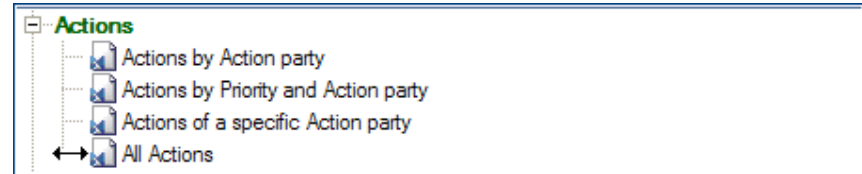
Case: 'Simple sample Black BowTieXP file based on Test File (v325 and later)'

### All Actions with 'Corporate Support Function' as Action party sorted by Priority Case: 'Simple sample Black BowTieXP file based on Test File (v325 and later)'

<b>Review containment Querying how contained will be effected</b>			
Target		Priority	
Action party	CSF Corporate Support Function	Completed	No
<i>Path: (LOC.) Hazardous Site            (HAZ.) 5.4.4.1 Heating Chemicals in the Catalyser Heater / Overheated Catalyser            (CONS.) Enhanced combustion within gas cloud (contained onsite)            (ACTN.) Review containment Querying how contained will be effected</i>			

<b>Review Review Control</b>			
Control needs Escalation Factor attached			
Target		Priority	
Action party	CSF Corporate Support Function	Completed	No
<i>Path: (LOC.) Hazardous Site            (HAZ.) 5.4.4.1 Heating Chemicals in the Catalyser Heater / Overheated Catalyser            (THT.) Inadequate design of plant            (CTL.) Main elements of plant designed by reputable provider of Chemical catalyser systems            (ACTN.) Review Review Control</i>			

**Section A: Actions**  
**Report 4: All Actions**



## All Actions

Case: 'Simple sample Black BowTieXP file based on Test File (v325 and later)'

## All Actions

Case: 'Simple sample Black BowTieXP file based on Test File (v325 and later)'

Require temp threshold Require temp threshold			
Require temp threshold			
Target		Priority	
Action party	<NULL> <No Value Assigned>	Completed	No
Path: (LOC.) Hazardous Site			
(HAZ.) 5.4.4.1 Heating Chemicals in the Catalyser Heater / Overheated Catalyser			
(CONS.) Enhanced combustion within gas cloud (contained onsite)			
(CTL.) Evacuation of worksite on indication of temperature runaway			
(ACTN.) Require temp threshold Require temp threshold			

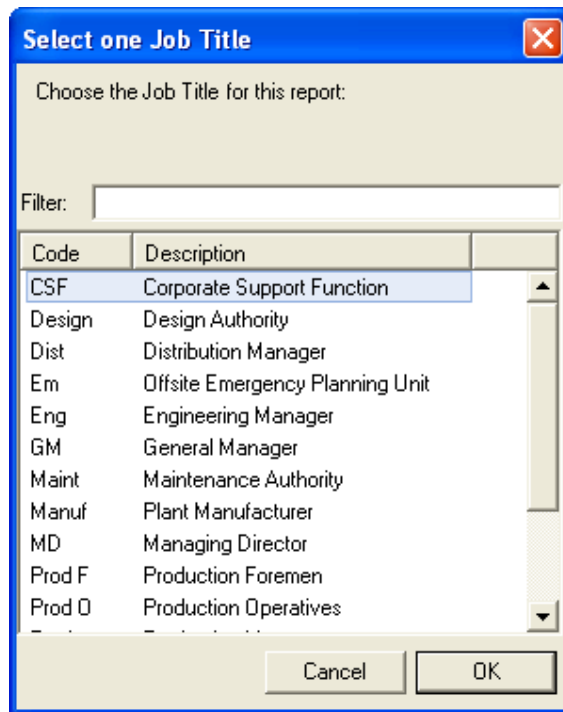
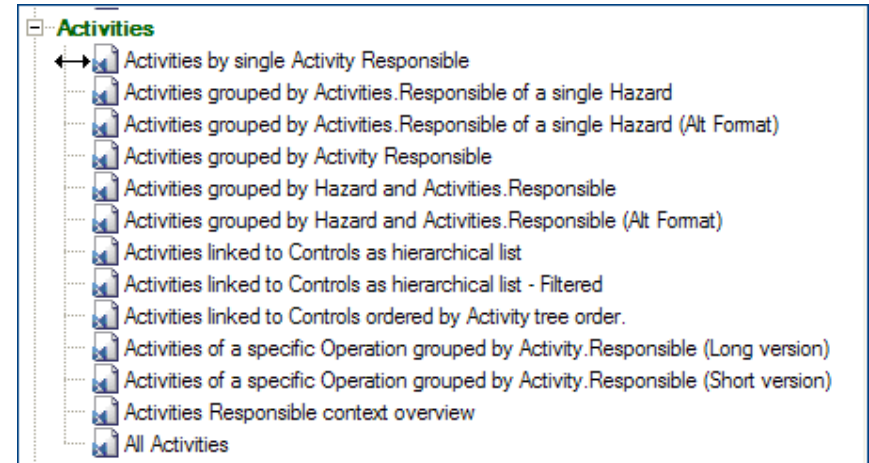
Review containment Querying how contained will be effected			
Review containment			
Target		Priority	
Action party	<NULL> <No Value Assigned>	Completed	No
Path: (LOC.) Hazardous Site			
(HAZ.) 5.4.4.1 Heating Chemicals in the Catalyser Heater / Overheated Catalyser			
(CONS.) Enhanced combustion within gas cloud (contained onsite)			
(ACTN.) Review containment Querying how contained will be effected			

Review Review Control			
Control needs Escalation Factor attached			
Target		Priority	
Action party	<NULL> <No Value Assigned>	Completed	No
Path: (LOC.) Hazardous Site			
(HAZ.) 5.4.4.1 Heating Chemicals in the Catalyser Heater / Overheated Catalyser			
(THT.) Inadequate design of plant			
(CTL.) Main elements of plant designed by reputable provider of Chemical catalyser systems			
(ACTN.) Review Review Control			

**Section B:**

**Section B: Activities**

**Report 1: Activities by Single Activity Responsible**



## Selection by single Activity.Responsible: 'Corporate Support Function'

Case: 'Simple sample Black BowTieXP file based on Test File (v325 and later)'

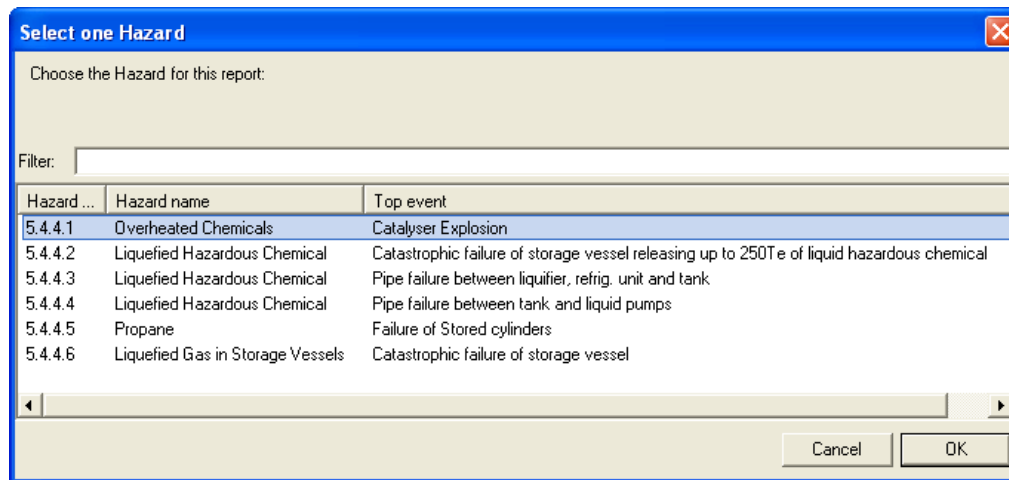
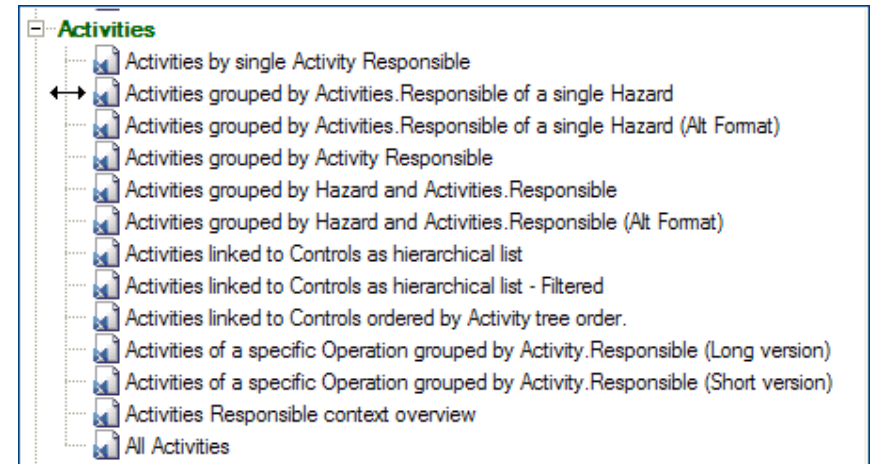
### Responsible : 'Corporate Support Function'

Case: 'Simple sample Black BowTieXP file based on Test File (v325 and later)'

Activity	Name	Description	Inputs	Outputs	Verification	Frequency
W-5.3	Carry out Technical and Managerial Audits					
W-5.3.01	Carry out Technical and Managerial Audits					

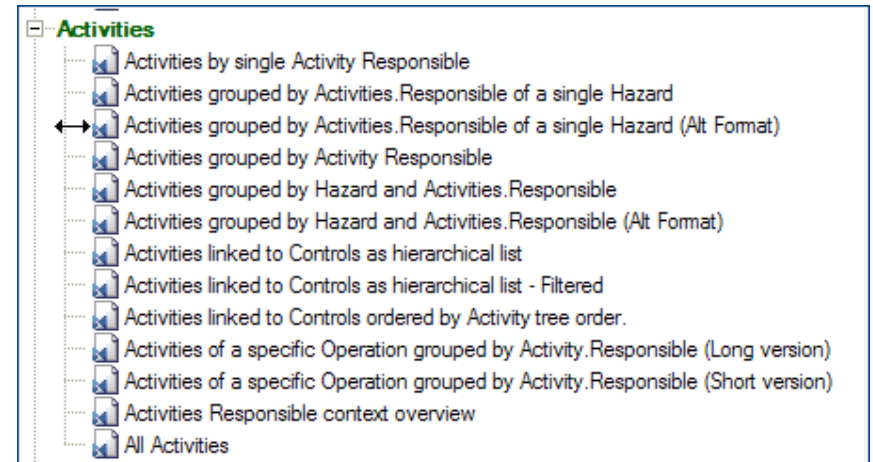
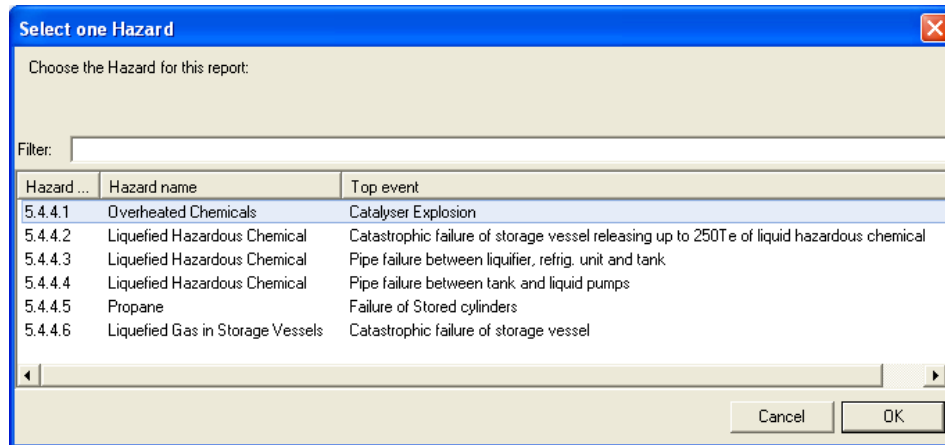
**Section B: Activities**

**Report 2: Activities grouped by Activities. Responsible of a Single Hazard (UNFIN)**



**Section B: Activities**

**Report 3: Activities grouped by Activities. Responsible of a Single Hazard (Alt Format)**



## Activities of Hazard : 'Heating Chemicals in the Catalyser Heater', grouped by Activity.Responsible

Case: 'Simple sample Black BowTieXP file based on Test File (v325 and later)'

Case: 'Simple sample Black BowTieXP file based on Test File (v325 and later)'

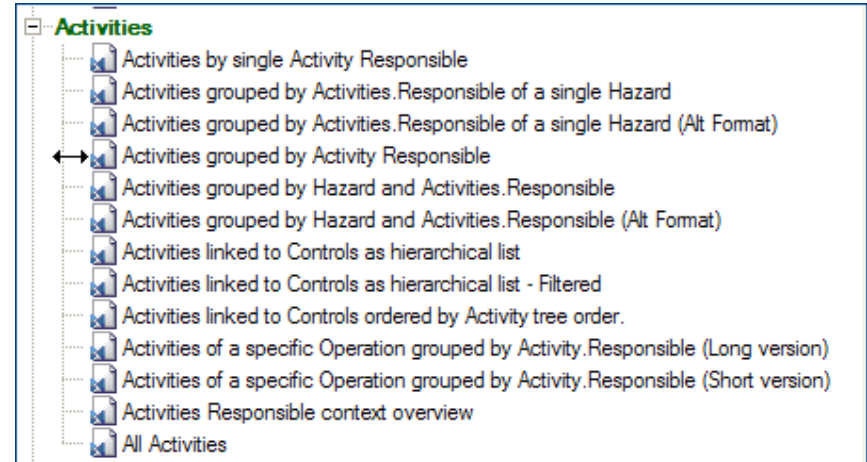
### Hazard: 5.4.4.1 Heating Chemicals in the Catalyser Heater / Overheated Catalyser

Code	Name	Description	Inputs	Outputs	Verification	Frequency
<b>&lt;No Value Assigned&gt;</b>						
W-2.1.02	Operate plant in accordance with operating instructions for normal operations.					
W-2.3.03	Control/monitor vessel Entry					
W-2.3.08	Operate Permit to Work system					
<b>Design Authority</b>						
W-1.1.01	Approve Plant Conceptual Design				Records of Hazop	
W-1.1.02	Detail design of Company designed parts of plant		<ul style="list-style-type: none"> <li>Storage and Transport Standards</li> </ul>		Company plant design documents	
W-1.1.04	Approve plant instrumentation design		<ul style="list-style-type: none"> <li>Detail design documents</li> <li>Hazop records</li> </ul>		P&ID Drawings Records of Hazop	
W-1.1.05	Carry out detail safety studies on plant design		<ul style="list-style-type: none"> <li>Detail design documents</li> <li>Hazop records</li> </ul>		Hazop records	
<b>Engineering Manager</b>						
W-1.2.02	Quality Checks during on-site construction		<ul style="list-style-type: none"> <li>Contractor Selection and Control</li> </ul>		??	
W-3.2.06	Ensure Proper Identification of Plant and Equipment		<ul style="list-style-type: none"> <li>P&amp;ID drawings modified when required following plant modifications</li> </ul>		Visual inspection of plant	

**Section B: Activities**

**Report 4: Activities grouped by Activity Responsible**

**Activities grouped by Activity Responsible) (All)  
Case: 'Untitled'**



**Corporate Support Function**

Activity	Name	Description	Input Documents	Verification
W-5.3	Carry out Technical and Managerial Audits			
W-5.3.01	Carry out Technical and Managerial Audits			

**Design Authority**

Activity	Name	Description	Input Documents	Verification
W-1.1	Design Plant and site			
W-1.1.01	Approve Plant Conceptual Design			Records of Hazop
W-1.1.02	Detail design of Company designed parts of plant		• Storage and Transport Standards	Company plant design documents P&ID Drawings ??
W-1.1.03	Approve plant specification for pressure systems		• Detail design documents	Records of Hazop
W-1.1.04	Approve plant instrumentation design		• Detail design documents • Hazop records	Hazop records
W-1.1.05	Carry out detail safety studies on plant design		• Detail design documents • Hazop records	Hazop records
W-1.1.06	Design site layout for safety		• LPG Standards	Barriering around pressure systems in vehicle access routes Standards and audit records for minimisation of fire hazards and combustibile materials Separation of facilities compliant with BOC standards (GS259, 160, Distribution and Storage Manual)

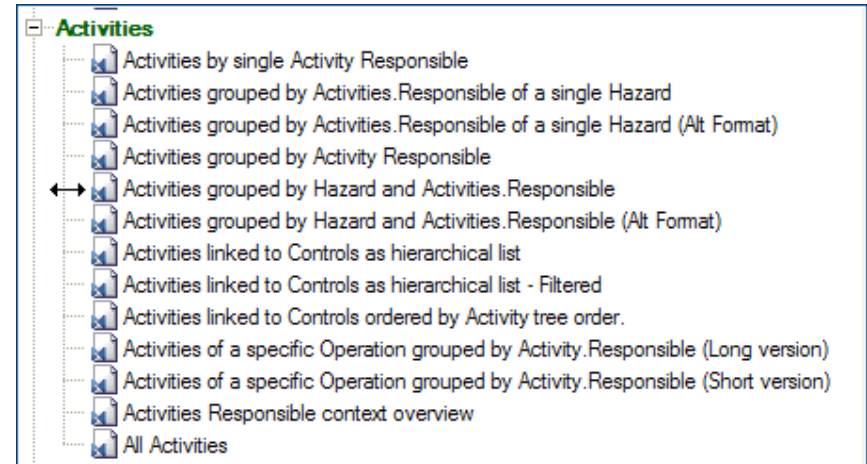
**Section B: Activities**

**Report 5: Activities grouped by Hazard and Activities.Responsible**

**Activities per Hazard, grouped by Activity.Responsible**

Case: 'Untitled'

Hazard: 5.4.4.1 Overheated Chemicals / Catalyser Explosion



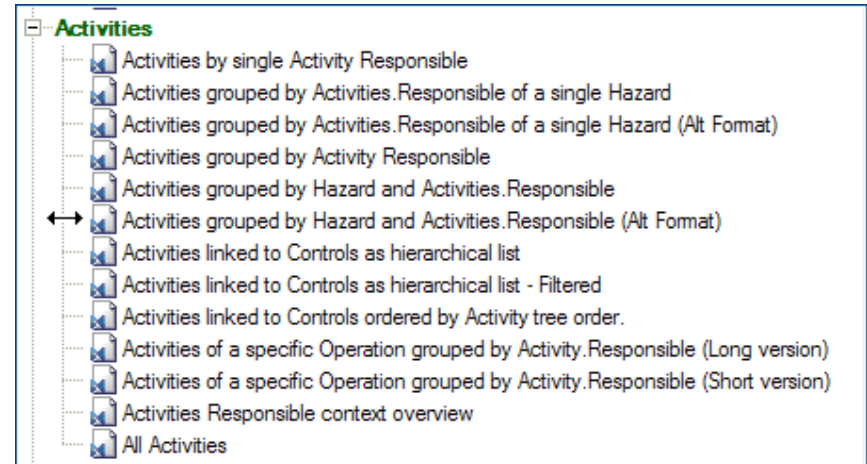
Code	Name	Description	Inputs	Verification
<b>&lt;No Value Assigned&gt;</b>				
W-2.1.02	Operate plant in accordance with operating instructions for normal operations.			
W-2.3.03	Control/monitor vessel Entry			
W-2.3.08	Operate Permit to Work system			
<b>Design Authority</b>				
W-1.1.01	Approve Plant Conceptual Design			Records of Hazop
W-1.1.02	Detail design of Company designed parts of plant		• Storage and Transport Standards	Company plant design documents P&ID Drawings
W-1.1.04	Approve plant instrumentation design		• Detail design documents • Hazop records	Records of Hazop
W-1.1.05	Carry out detail safety studies on plant design		• Detail design documents • Hazop records	Hazop records
W-1.2.01	Select Construction Contractor		• Contractor Selection and Management	At time of construction of plant, contractor was selected on basis of known capability in development and construction of this type of plant. Contractors now selected in accordance with BOC Procedure GS259
W-1.2.03	Quality checks carried out during off-site manufacturing processes		• Contractor Selection and Control	Manufacturing records

**Section B: Activities**

**Report 6: Activities grouped by Hazard and Activities.Responsible (Alternate Format)**

**Activities per Hazard, grouped by Activity.Responsible**  
Case: 'Untitled'

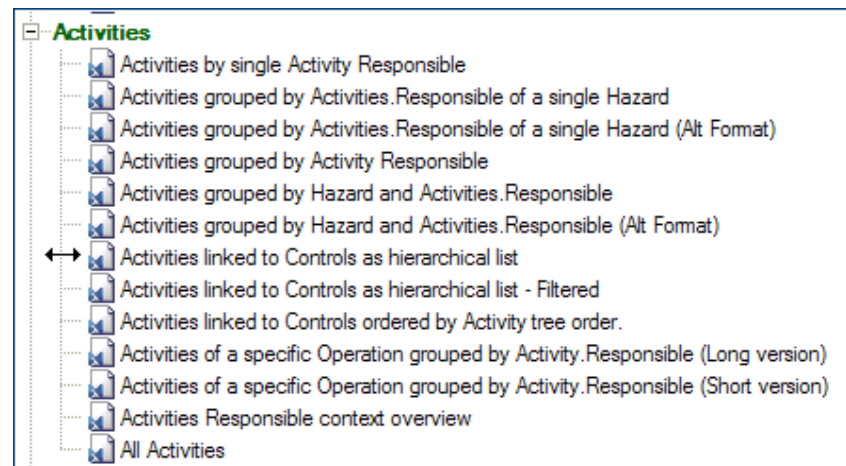
**Hazard: 5.4.4.1 Overheated Chemicals / Catalyser Explosion**



Code	Name	Inputs	Verification
<b>&lt;No Value Assigned&gt;</b>			
W-2.1.02	Operate plant in accordance with operating instructions for normal operations.		
W-2.3.03	Control/monitor vessel Entry		
W-2.3.08	Operate Permit to Work system		
<b>Design Authority</b>			
W-1.1.01	Approve Plant Conceptual Design		Records of Hazop
W-1.1.02	Detail design of Company designed parts of plant	<ul style="list-style-type: none"> <li>Storage and Transport Standards</li> </ul>	Company plant design documents P&ID Drawings
W-1.1.04	Approve plant instrumentation design	<ul style="list-style-type: none"> <li>Detail design documents</li> <li>Hazop records</li> </ul>	Records of Hazop
W-1.1.05	Carry out detail safety studies on plant design	<ul style="list-style-type: none"> <li>Detail design documents</li> <li>Hazop records</li> </ul>	Hazop records
W-1.2.01	Select Construction Contractor	<ul style="list-style-type: none"> <li>Contractor Selection and Management</li> </ul>	At time of construction of plant, contractor was selected on basis of known capability in development and construction of this type of plant. Contractors now selected in accordance with BOC Procedure GS259
W-1.2.03	Quality checks carried out during off-site manufacturing processes	<ul style="list-style-type: none"> <li>Contractor Selection and Control</li> </ul>	Manufacturing records

**Section B: Activities**

**Report 7: Activities linked to Controls as Hierarchical list**



<b>W-1.1 Design Plant and site</b>	
	W-1.1.01 Approve Plant Conceptual Design
	W-1.1.02 Detail design of Company designed parts of plant
	W-1.1.03 Approve plant specification for pressure systems
	W-1.1.04 Approve plant instrumentation design
	W-1.1.06 Design site layout for safety
	W-1.1.07 Design storage vessels to appropriate standards
	W-1.1.08 Operate Branch Controlled Modification System

<b>W-1.2 Construct Plant</b>	
	W-1.2.01 Select Construction Contractor
	W-1.2.02 Quality Checks during on-site construction
	W-1.2.03 Quality checks carried out during off-site manufacturing processes

<b>W-1.3 Commission Plant</b>	
	W-1.3.01 Carry out plant commissioning checks

<b>W-1.4 Manage Contractors</b>	

**Section B: Activities**

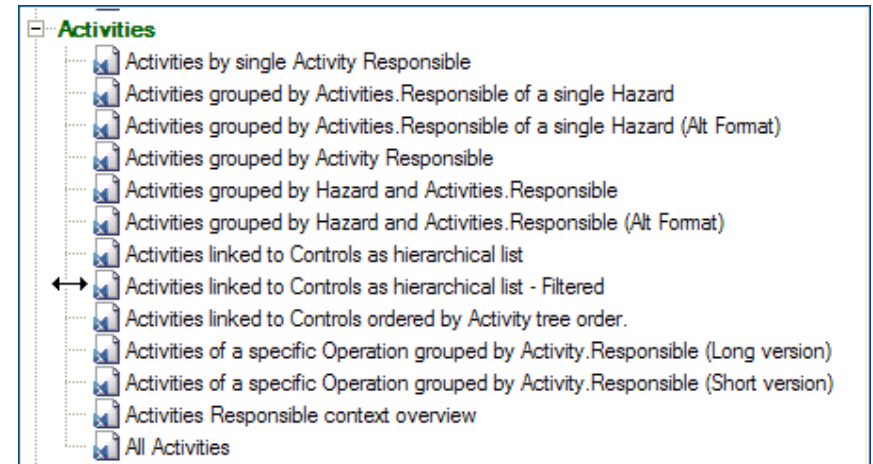
**Report 8: Activities linked to Controls as Hierarchical list - Filtered**

Activities Linked to Controls

<b>W-1.1 Design Plant and site</b>	
	W-1.1.01 Approve Plant Conceptual Design
	W-1.1.02 Detail design of Company designed parts of plant
	W-1.1.03 Approve plant specification for pressure systems
	W-1.1.04 Approve plant instrumentation design
	W-1.1.05 Carry out detail safety studies on plant design
	W-1.1.06 Design site layout for safety
	W-1.1.07 Design storage vessels to appropriate standards

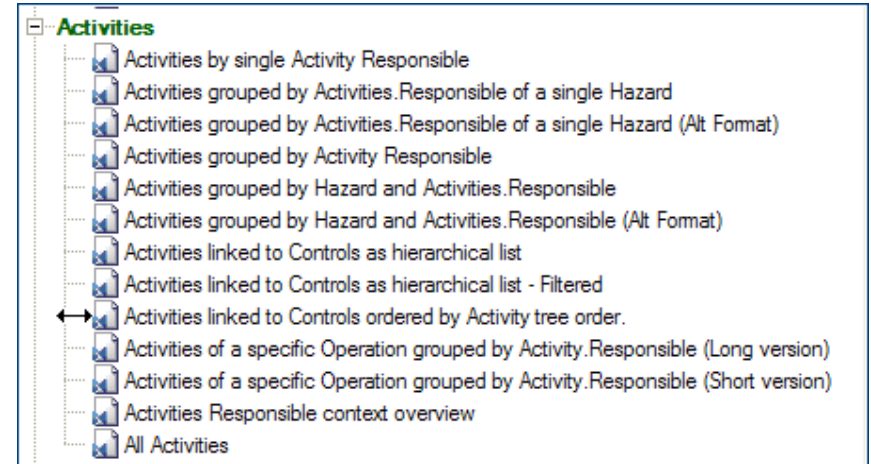
<b>W-1.2 Construct Plant</b>	
	W-1.2.01 Select Construction Contractor
	W-1.2.02 Quality Checks during on-site construction
	W-1.2.03 Quality checks carried out during off-site manufacturing processes

<b>W-2.1 Operate Plant</b>	
	W-2.1.01 Sample LAN before delivery
	W-2.1.02 Operate plant in accordance with operating instructions for normal operations.
	W-2.1.03 Operate plant in accordance with operating instructions for normal operation



**Section B: Activities**

**Report 9: Activities linked to Controls ordered by Activity tree order**



**W-1.1.01 Approve Plant Conceptual Design**

**Path:** + W-1.1 Design Plant and site  
+ W-1.1.01 Approve Plant Conceptual Design

**Responsible:** Design Design Authority

**BowTie Path:** + (HAZ.) 5.4.4.1 Overheated Chemicals / Catalyser Explosion  
+ (THT.) Inadequate design of plant

<b>Control</b>	<b>Control type</b>	<b>Effectiveness</b>	<b>Accountable</b>	<b>Brf code</b>
Main elements of plant designed by reputable provider of Chemical catalyser systems	Project Construction Management	Good	<No Value Assigned>	DE Design
Design (including Company aspects) approved by Company Design Authorities	Project Construction Management	Very Good	<No Value Assigned>	DE Design

**BowTie Path:** + (HAZ.) 5.4.4.1 Overheated Chemicals / Catalyser Explosion  
+ (THT.) Injected Chemical over-temperature

<b>Control</b>	<b>Control type</b>	<b>Effectiveness</b>	<b>Accountable</b>	<b>Brf code</b>
Chemical heated by pressurised hot water (18 bar - 185-190degC) limiting temperature to well below catalyser temperature	Design - Process concept	Very Good	<No Value Assigned>	DE Design

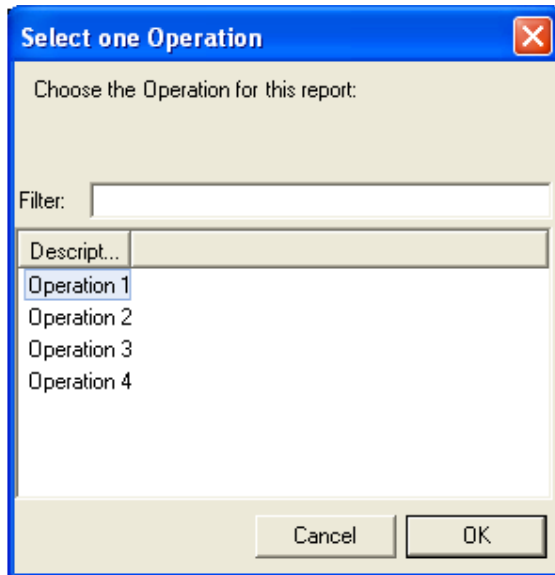
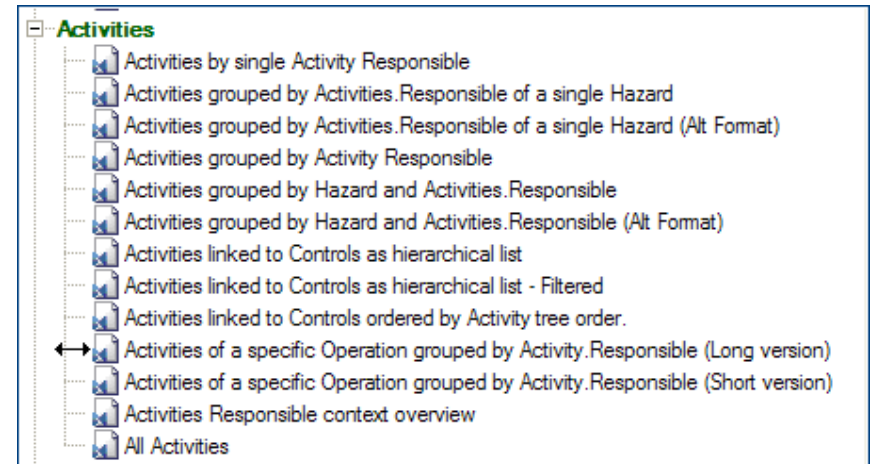
**BowTie Path:** + (HAZ.) 5.4.4.1 Overheated Chemicals / Catalyser Explosion  
+ (THT.) Temperature Excursion in Process

<b>Control</b>	<b>Control type</b>	<b>Effectiveness</b>	<b>Accountable</b>	<b>Brf code</b>
Process suppresses reaction when cold Chemical is injected following detected pressure rise	Design - Process concept	Very Poor	<No Value Assigned>	DE Design

## Advanced, Section B

### Advanced, Section B: Activities

#### Report 10: Activities of a specific Operation grouped by Activity.Responsible (Long Version)



## Activities of Operation 'Operation 1' grouped by Activity.Responsible

1. Design Design Authority
2. Eng Engineering Manager
3. Prod F Production Foremen
4. Prod O Production Operatives
5. Prod Production Manager

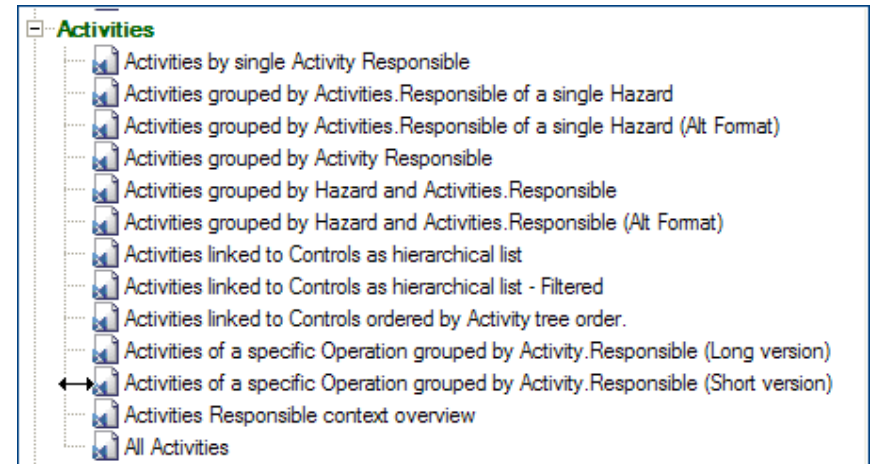
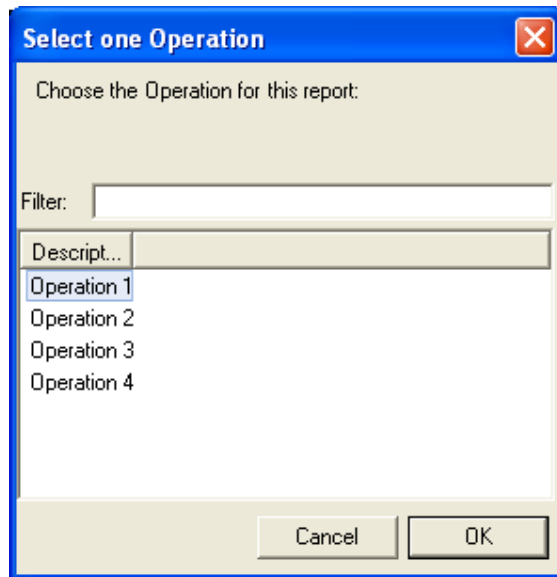
### 1. Design Design Authority

#### 1.1 Activities related to Hazards, Threats and Consequences

Activity	Name	Description	Verification	Frequency	Category
W-1.1.01	Approve Plant Conceptual Design		Records of Hazop	<No Value Assigned>	<No Value Assigned>
		<p><i>Activity W-1.1.01 is linked to these Controls</i></p> <p><i>(Haz.) 5.4.4.1 Heating Chemicals in the Catalyser Heater / Overheated Catalyser</i>  <i>(Tht.) Inadequate design of plant</i>  <i>(Ctl.) Main elements of plant designed by reputable provider of Chemical catalyser systems</i></p> <p><i>(Haz.) 5.4.4.1 Heating Chemicals in the Catalyser Heater / Overheated Catalyser</i>  <i>(Tht.) Inadequate design of plant</i>  <i>(Ctl.) Design (including Company aspects) approved by Company Design Authorities</i></p> <p><i>(Haz.) 5.4.4.1 Heating Chemicals in the Catalyser Heater / Overheated Catalyser</i>  <i>(Tht.) Injected Chemical over-temperature</i>  <i>(Ctl.) Chemical heated by pressurised hot water (18 bar - 185-190degC) limiting temperature to well below catalyser temperature</i></p> <p><i>(Haz.) 5.4.4.2 Liquefied Hazardous Chemicals Used in Production Facility / Catastrophic failure of storage vessel releasing up to 250Te of liquid hazardous chemical</i>  <i>(Tht.) Overpressure in Tank</i>  <i>(Ctl.) Pump provided with control system to trip at max head of 3 bar, limiting pressure into tank</i></p> <p><i>(Haz.) 5.4.4.3 Liquefied Hazardous Chemicals Used in Production Facility / Pipe failure between liquifier, refrig. unit and tank</i>  <i>(Tht.) Dropped / Fallen Object</i>  <i>(Ctl.) Pipework is within building - potential for dropped load is reduced</i></p>			
W-1.1.02	Detail design of Company designed parts of plant		Company plant design documents P&ID Drawings	<No Value Assigned>	<No Value Assigned>

**Advanced, Section B: Activities**

**Report 11: Activities of a specific Operation grouped by Activity. Responsible (Short Version)**



## Activities of Operation 'Operation 1' grouped by Activity.Responsible

1. Design Design Authority
2. Eng Engineering Manager
3. Prod F Production Foremen
4. Prod O Production Operatives
5. Prod Production Manager

### 1. Design Design Authority

#### 1.1 Activities related to Hazards, Threats and Consequences

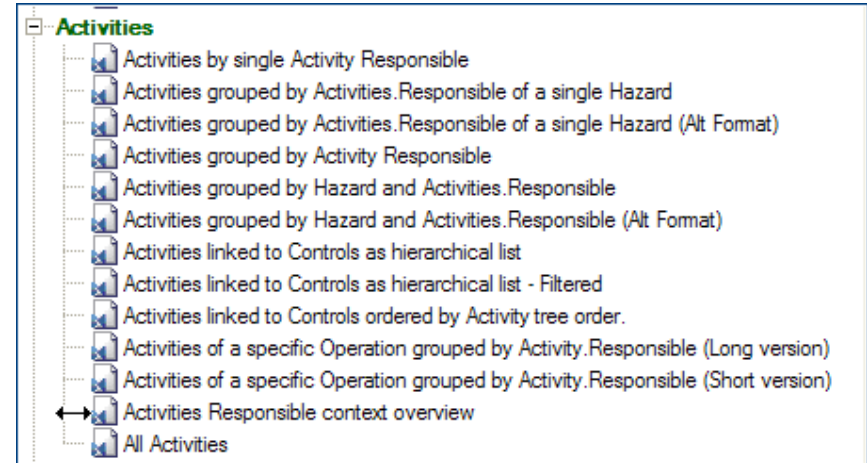
Activity	Name	Description	Verification	Frequency	Category
W-1.1.01	Approve Plant Conceptual Design		Records of Hazop	<No Value Assigned>	<No Value Assigned>
W-1.1.02	Detail design of Company designed parts of plant		Company plant design documents	<No Value Assigned>	<No Value Assigned>
W-1.1.03	Approve plant specification for pressure systems		P&ID Drawings ??	<No Value Assigned>	<No Value Assigned>
W-1.1.04	Approve plant instrumentation design		Records of Hazop	<No Value Assigned>	<No Value Assigned>
W-1.1.05	Carry out detail safety studies on plant design		Hazop records	<No Value Assigned>	<No Value Assigned>
W-1.1.06	Design site layout for safety		Barriering around pressure systems in vehicle access routes Standards and audit records for minimisation of fire hazards and combustible materials Separation of facilities compliant with BOC standards (GS259, 160, Distribution and Storage Manual)	<No Value Assigned>	<No Value Assigned>
W-1.1.07	Design storage vessels to appropriate standards		Vessel design records (See also records in Section 6 of COMAH report on vessel specifications and ages)	<No Value Assigned>	<No Value Assigned>
W-1.2.01	* Select Construction Contractor		At time of construction of plant, contractor was selected on basis of known capability in development and construction of this type of plant. Contractors now selected in accordance with BOC Procedure GS259	<No Value Assigned>	<No Value Assigned>
W-1.2.03	* Quality checks carried out during off-site manufacturing processes		Manufacturing records	<No Value Assigned>	<No Value Assigned>

#### 1.2 Activities directly linked to Operation 'Operation 1'

No associated activities.

**Section B: Activities**

**Report 12: Activities Responsible context overview**



## Activities Responsible context overview

Overview of Activities, in the context of Controls and Hazards grouped by Activity.Responsible

### Bulk tanker drivers (Tan)

**Activity Code**      **Activity Name/Description**

**W-2.3.01**      **Correct bulk filling and offloading of storage tanks**

*Hazard : 5.4.4.5 Propane Stored in a Pressurised Cylinder in the Warehouse (W/Incident Analysis) - Failure of Stored cylinders (Hazardous Site)*  
*Control : LPG cylinders are designed to BS5045 Part 2 as Transportable Gas containers (DE)*  
*Threat: Vehicle Impact*

### Corporate Support Function (CSF)

**Activity Code**      **Activity Name/Description**

**W-5.3.01**      **Carry out Technical and Managerial Audits**

*No associated Hazards*

### Design Authority (Design)

**Activity Code**      **Activity Name/Description**

**W-1.1.01**      **Approve Plant Conceptual Design**

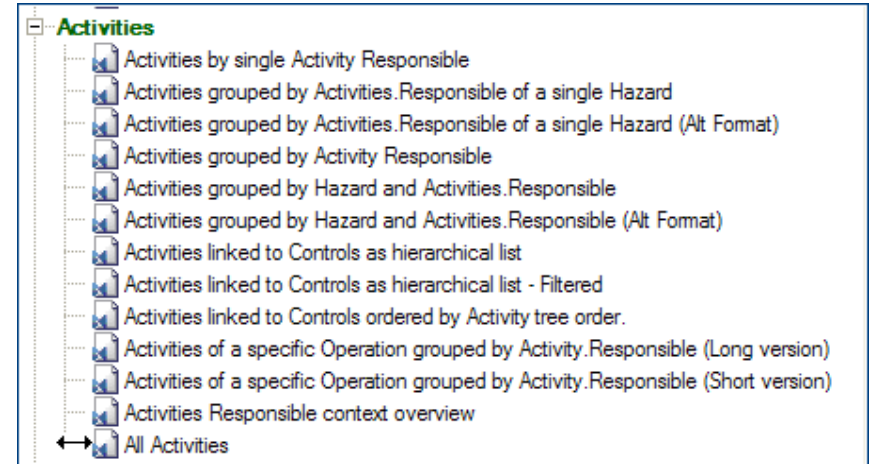
*Hazard : 5.4.4.1 Heating Chemicals in the Catalyser Heater - Overheated Catalyser (Hazardous Site)*  
*Control : Main elements of plant designed by reputable provider of Chemical catalyser systems (DE)*  
*Threat: Inadequate design of plant*

**Section B: Activities**

**Report 13: All Activities**

**Activity specification sheet**

**Activity: W-1.1 Design Plant and site**



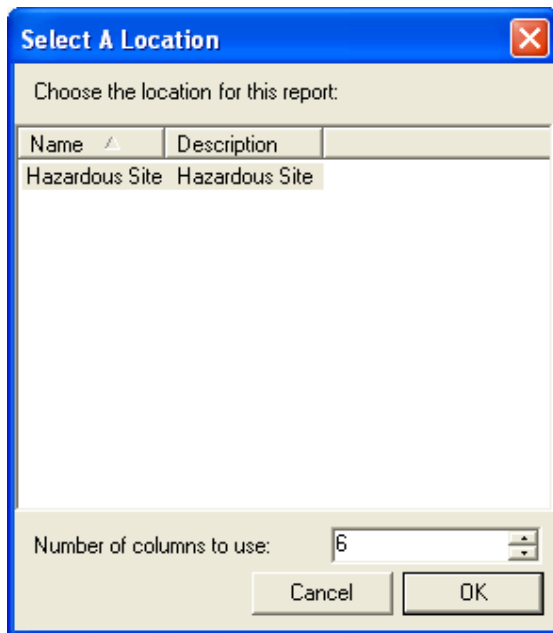
<b>Category</b>	Corporate Management System
<b>Responsible</b>	Design Authority
<b>Outputs</b>	Detail design documents Hazop records Plant P&ID Drawings

Sub-Activities Code	Name	Responsible
W-1.1.01	Approve Plant Conceptual Design	Design Design Authority
W-1.1.02	Detail design of Company designed parts of plant	Design Design Authority
W-1.1.03	Approve plant specification for pressure systems	Design Design Authority
W-1.1.04	Approve plant instrumentation design	Design Design Authority
W-1.1.05	Carry out detail safety studies on plant design	Design Design Authority
W-1.1.06	Design site layout for safety	Design Design Authority
W-1.1.07	Design storage vessels to appropriate standards	Design Design Authority
W-1.1.08	Operate Branch Controlled Modification System	Eng Engineering Manager

**Section C:**

***Section C: Control Types***

***Report 1: Control Type count of a Location***



The dialog box titled "Select A Location" contains the following elements:

- Header: "Select A Location" with a close button (X).
- Text: "Choose the location for this report:"
- Table with columns "Name" and "Description":

Name	Description
Hazardous Site	Hazardous Site
- Text: "Number of columns to use:" with a spin box set to 6.
- Buttons: "Cancel" and "OK".

Case: 'Simple sample Black BowTieXP file based on Test File (v325 and later)' - Report: 'Control type count of Location 'Hazardous Site''

	<No Value Assigned>	Administrative	Control of Energy Release	Design - Detail Design	Design - Process concept	Design - Protection System
<b>Heating Chemicals in the Catalyser Heater</b>						
<i>Threats:</i>						
Inadequate design of plant				1	1	
Improper construction of plant						
Improper operation of plant	2			1		
Injected Chemical over-temperature					1	1
Incorrect Chemical specification						
Temperature Excursion in Process			1		2	10
<i>Consequences:</i>						
Enhanced combustion within gas cloud (contained onsite)						
Projectile damage to product bulk storage	1					
Un-ignited pressure burst causing spread of hot liquid and gaseous product						
Building damage, possibly extending offsite	1					
<b>Liquefied Hazardous Chemicals Used in Production Facility</b>						
<i>Threats:</i>						
Vehicle Impact						
Mechanical failure				1		
Projectile Damage	2					1
Overpressure in Tank		1		2	1	
Guillotine failure of gas line from liquid pumps leading to severe cooling of vessel and subsequent fracture	1					
<i>Consequences:</i>						
Enhanced combustion within gas cloud (contained onsite)				1		
Personnel overcome by effects of chemicals (Onsite effects only)			1			
<b>Liquefied Hazardous Chemicals Used in Production Facility</b>						
<i>Threats:</i>						
Dropped / Fallen Object						
Mechanical failure				1		
Vibration / Fatigue / Thermal Stress				1		
<i>Consequences:</i>						
Unisolatable gas release (gas cloud contained onsite)	1					
Enhanced combustion within gas cloud (contained onsite)						



**Section D: Controls**

**Report 2: Control Accountable context overview of a specific Hazard**

**Select one Hazard** ✖

Choose the Hazard for this report:

Filter:

Hazard ...	Hazard name	Top event
5.4.4.1	Overheated Chemicals	Catalyser Explosion
5.4.4.2	Liquefied Hazardous Chemical	Catastrophic failure of storage vessel releasing up to 250Te of liquid hazardous chemical
5.4.4.3	Liquefied Hazardous Chemical	Pipe failure between liquifier, refrig. unit and tank
5.4.4.4	Liquefied Hazardous Chemical	Pipe failure between tank and liquid pumps
5.4.4.5	Propane	Failure of Stored cylinders
5.4.4.6	Liquefied Gas in Storage Vessels	Catastrophic failure of storage vessel

## Section D: Controls

### Report 3: Control Register

Control	# Times occurring	Code	Description	Control type	Effectiveness	Accountable	Brf code	Acceptance criteria have been met	Parent Tht./Cons.	Location	Hazard
Acoustic alarm provided driven from pressure sensors											
(Haz.) 5.4.4.1 Heating Chemicals in the Catalyser Heater / Overheated Catalyser // (Tht.) Temperature Excursion in Process // (Ctl.) Emergency quench available from two independent sources // (Esc.) Quench is not initiated successfully // (Ctl.) Acoustic alarm provided driven from pressure sensors			Acoustic alarm provided driven from pressure sensors	Safety	Very Poor		Defences	No	Tht. Temperature Excursion in Process	Hazardous Site	5.4.4.1 Heating Chemicals in the Catalyser Heater / Overheated Catalyser
Activate Emergency Reponse plan	3										
(Haz.) 5.4.4.1 Heating Chemicals in the Catalyser Heater / Overheated Catalyser // (Cons.) Enhanced combustion within gas cloud (contained onsite) // (Ctl.) Activate Emergency Reponse plan			Activate Emergency Reponse plan	Guarding or Shielding	Good		Defences	No	Cons. Enhanced combustion within gas cloud (contained onsite)	Hazardous Site	5.4.4.1 Heating Chemicals in the Catalyser Heater / Overheated Catalyser
(Haz.) 5.4.4.1 Heating Chemicals in the Catalyser Heater / Overheated Catalyser // (Cons.) Un-ignited pressure burst causing spread of hot liquid and gaseous product // (Ctl.) Activate Emergency Reponse plan			Activate Emergency Reponse plan	Guarding or Shielding	Good		Defences	No	Cons. Un-ignited pressure burst causing spread of hot liquid and gaseous product	Hazardous Site	5.4.4.1 Heating Chemicals in the Catalyser Heater / Overheated Catalyser
(Haz.) 5.4.4.2 Liquefied Hazardous Chemicals Used in Production Facility / Catastrophic failure of storage vessel releasing up to 250Te of liquid hazardous chemical // (Cons.) Enhanced combustion within gas cloud (contained onsite) // (Ctl.) Activate Emergency Reponse plan			Activate Emergency Reponse plan	Guarding or Shielding	Good		Defences	No	Cons. Enhanced combustion within gas cloud (contained onsite)	Hazardous Site	5.4.4.2 Liquefied Hazardous Chemicals Used in Production Facility / Catastrophic failure of storage vessel releasing up to 250Te of liquid chemical

**Section G:**

**Section G: Escalation Factors**

**Report 1: Escalation Factors sorted by Control Type**

**Escalation Factors sorted by Control type**  
**Case: 'Untitled'**

**Escalation Factors with Controls of Control type 'Guarding or Shielding'**

Location: Hazardous Site  
Hazard: 5.4.4.1 Overheated Chemicals / Catalyser Explosion  
Threat: Temperature Excursion in Process  
Control: Reaction controlled by primary and back-up pressure sensors  
Escalation Factor: Failure of pressure sensors or control band too wide  
**Control: Limited control point adjustment, by settings within plant safety parameters**

**Escalation Factors with Controls of Control type 'Separation (Time or Space)'**

**Result** No results for this Control type

**Escalation Factors with Controls of Control type 'Reduction in Inventory'**

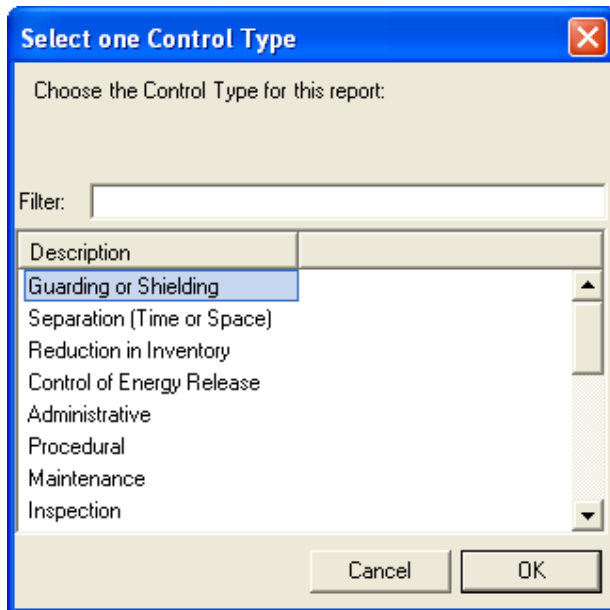
**Result** No results for this Control type

**Escalation Factors with Controls of Control type 'Control of Energy Release'**

Location: Hazardous Site  
Hazard: 5.4.4.1 Overheated Chemicals / Catalyser Explosion  
Threat: Temperature Excursion in Process  
Control: Relief valve and bursting disc to relieve overpressure  
Escalation Factor: Capacity of vent/bursting disc exceeded  
**Control: Safety valve and rupture disc sized to allow whole Chemical Mass to escape without**

**Section G: Escalation Factors**

**Report 2: Escalation Factors with Controls of type... (UNFIN)**



## Escalation Factors with Controls of Control type 'Guarding or Shielding'

### Case: 'Simple sample Black BowTieXP file based on Test File (v325 and later)'

Location: Hazardous Site

Hazard: 5.4.4.1 Heating Chemicals in the Catalyser Heater / Overheated Catalyser

Threat: Temperature Excursion in Process

Control: Reaction controlled by primary and back-up pressure sensors

Escalation Factor: Failure of pressure sensors or control band too wide

**Control: Limited control point adjustment, by settings within plant safety parameters**

## ***Section G: Escalation Factors***

### ***Report 3: Escalation Factors without Controls***

#### **Escalation Factors with No Controls**

##### **Case: 'Untitled'**

Location: Hazardous Site

Hazard: 5.4.4.4 Liquefied Hazardous Chemical / Pipe failure between tank and liquid pumps

Consequence: Slow release of tank contents

Control: Isolation of Leak

**Escalation Factor: Isolation Valves cannot be accessed due to gas cloud**

OR

#### **Escalation Factors with No Controls**

##### **Case: 'Simple sample Black BowTieXP file based on Test File (v325 and later)'**

**No results.** All Escalation Factors seem to have Controls.

**Section H:**

**Section H: Hazards**

**Report 1: Report of a specific Hazard (UNFIN)**

**Select one Hazard**

Choose the Hazard for this report:

Filter:

Hazard ...	Hazard name	Top event
5.4.4.1	Overheated Chemicals	Catalyser Explosion
5.4.4.2	Liquefied Hazardous Chemical	Catastrophic failure of storage vessel releasing up to 250Te of liquid hazardous chemical
5.4.4.3	Liquefied Hazardous Chemical	Pipe failure between liquifier, refrig. unit and tank
5.4.4.4	Liquefied Hazardous Chemical	Pipe failure between tank and liquid pumps
5.4.4.5	Propane	Failure of Stored cylinders
5.4.4.6	Liquefied Gas in Storage Vessels	Catastrophic failure of storage vessel

Cancel OK

## Section H: Hazards

### Report 2: Report of all Hazards

## Hazard Specification Sheet

Case: 'Untitled'

### Hazard: 5.4.4.1 Overheated Chemicals

<b>Hazard code:</b>	5.4.4.1
<b>Hazard name:</b>	Overheated Chemicals
<b>Location:</b>	Hazardous Site
<b>Loc. Description:</b>	Hazardous Site
<b>Top event:</b>	Catalyser Explosion
<b>Affects:</b>	Health, Safety and Environment
<b>Build complete:</b>	No

#### Threats

Threat	Control	Escalation Factor	Control
• Inadequate design of plant	<ul style="list-style-type: none"> <li>Main elements of plant designed by reputable provider of Chemical catalyser systems</li> <li>Design (including Company aspects) approved by Company Design Authorities</li> <li>Design subjected to Hazop review</li> <li>System materials appropriate for chemical service (See Manufacturers Scope of supply)</li> </ul>		
• Improper construction of plant	<ul style="list-style-type: none"> <li>Manufacturer employed to carry out on-site process plant construction activities</li> <li>No high pressure on-site pipe welding carried out on Manufacturer supplied equipment</li> <li>QA checks carried out on items manufactured offsite, with relevant documentation being provided to Company</li> <li>On-site welds (on Company provided systems) pressure tested</li> </ul>		
• Improper operation of plant	<ul style="list-style-type: none"> <li>Plant operating and training manuals available</li> <li>Reactor operated to Operating Manual by trained personnel                             <ul style="list-style-type: none"> <li>Training material and Competency checks inadequate                                     <ul style="list-style-type: none"> <li>Training material being produced</li> <li>Competency to be assessed as now required in SMS, following a programme agreed by Company Safety and Quality Director</li> </ul> </li> </ul> </li> <li>Operators respond correctly to alarms and emergencies</li> <li>Plant components labelling being completed under action plan                             <ul style="list-style-type: none"> <li>Not all components properly identified                                     <ul style="list-style-type: none"> <li>Action plan to complete identification</li> </ul> </li> </ul> </li> </ul>		

**Section H: Hazards****Report 3: Short summary list of Hazards****List of Hazards****Case: 'Untitled'****Location: Hazardous Site**

<b>Hazard code</b>	<b>Hazard name</b>	<b>Top event</b>
5.4.4.1	Overheated Chemicals	Catalyser Explosion
5.4.4.2	Liquefied Hazardous Chemical	Catastrophic failure of storage vessel releasing up to 250Te of liquid hazardous chemical
5.4.4.3	Liquefied Hazardous Chemical	Pipe failure between liquifier, refrig. unit and tank
5.4.4.4	Liquefied Hazardous Chemical	Pipe failure between tank and liquid pumps
5.4.4.5	Propane	Failure of Stored cylinders
5.4.4.6	Liquefied Gas in Storage Vessels	Catastrophic failure of storage vessel

**Section J: Lists*****Section J: Lists******Report 1: Activities***

<b>Code</b>	<b>Name</b>
W-1.1	Design Plant and site
W-1.2	Construct Plant
W-1.3	Commission Plant
W-1.4	Manage Contractors
W-2.1	Operate Plant
W-2.3	Operate storage facilities
W-2.4	Implement Safe Systems of Work
W-2.5	Manage Site Operations
W-3.1	Produce Written Scheme of Examination
W-3.2	Maintenance of plant and equipment (excluding storage vessels)
W-3.3	Maintenance of lifting devices and infrastructure
W-3.4	Maintenance of storage vessels
W-3.5	Maintenance of emergency response equipment/PPE
W-4.1	Personnel competence assessment & training
W-4.2	Provide Plant Operating and Training Documentation
W-5.1	Develop Audit Checklists
W-5.2	Carry out Daily Monitoring
W-5.3	Carry out Technical and Managerial Audits
W-6.1	Emergency response activities, planning & training

***Section J: Lists******Report 2: Competencies*****Competency**

2 years relevant experience.

ONC/OND in Mech. Eng. or equivalent.

OND or equivalent.

Pass chemical handling course and possess valid permit.

Pass Permit To Work course and possess valid permit.

Possess valid licence for tankers

Read and write in English.

Speak common language with crew supervisor.

Speak common language with crew.

## **Section J: Lists**

### **Report 3: Document Links (UNFIN)**

#### **Document Links**

##### **Manufacturers Documents Company Operating Procedures**

**13/678/TR**  
Chemical Acceptance Test

##### **Company Standards**

**CoS 275**  
LPG Standards  
**CoS 10.0**  
Safe Systems of Work  
**CoS 21**  
Contractor Selection and Management  
**1S3-00-09**  
Stainless Steel Pipe Specification  
**CoS 1**  
Safety Management System  
**CoS 17 .9**  
Management of Change  
**CoS 10**  
Permit to Work System

## Section J: Lists

### Report 4: Inputs and Outputs

Input/Output	Document Links
Audit requirements of Safety Management System	
Branch Controlled Modification System	
Bulk storage tanker offloading and filling operating instructions	
Carboy filling operating instructions	
Checklist for Audits by Managing Director	
Checklists for Audits by General Manager	
Checklists for Audits by Production Manager	
Checklists for Monitoring by 1st Level Supervision	
Chemical Delivery Test Records	
Competence Assurance Checklists	
Competence Assurance Standard	CoS 12
Contract documents and technical specifications for build (Project files)	
Contractor Selection and Control	
Contractor Selection and Management	CoS 21
Detail design documents	CoS 275
Emergency Response Standard	
Findings from exercises and other incidents	
Hazop records	
Health and Safety Policy	
Inspection requirements from Pressure systems safety regulations	
LPG Standards	
Maintenance Records recorded in Maximo	
N2O plant instructions for operation in non-routine or emergency conditions	CoS 102.3
Offsite emergency response plan	
Onsite emergency response plan	
Operating instructions for LAN plant following LP Storage modification (held at Site)	
Operating logs	
Operations and Maintenance Bulletins	CoS 102.4

**Section J: Lists****Report 5: Job Titles**

<b>Code</b>	<b>Description</b>
CSF	Corporate Support Function
Design	Design Authority
Dist	Distribution Manager
Em	Offsite Emergency Planning Unit
Eng	Engineering Manager
GM	General Manager
Maint	Maintenance Authority
Manuf	Plant Manufacturer
MD	Managing Director
Prod F	Production Foremen
Prod O	Production Operatives
Prod	Production Manager
Proj	Project Manager
Q	Quality Manager
Sec	Security
Tan	Bulk tanker drivers

***Section J: Lists***

***Report 6: Systems***

**System**

Control Measures

Inherent Safety

Limitation Measures

Prevention Measures

**Section J: Lists****Report 7: Threats and Consequences****Hazardous Site****Overheated Chemicals**

## Threats:

- Inadequate design of plant
- Improper construction of plant
- Improper operation of plant
- Injected Chemical over-temperature
- Incorrect Chemical specification
- Temperature Excursion in Process

## Consequences:

- Enhanced combustion within gas cloud (contained onsite)
- Projectile damage to product bulk storage
- Un-ignited pressure burst causing spread of hot liquid and gaseous product
- Building damage, possibly extending offsite

**Section L:**

*Section L: Other*

*Report 1: Case File Index Report (UNFIN)*

## Section L: Other

### Report 2: Contents of Case File Overview (UNFIN)

## Case Overview

### Case: 'Untitled'

Location	Haz. ID.	Hazard	Top event	Consequence	Risk Assessments
Hazardous Site	5.4.4.1	Overheated Chemicals	Catalyser Explosion	Enhanced combustion within gas cloud (contained onsite) Projectile damage to product bulk storage	<ul style="list-style-type: none"> <li>• People: C4 Incorporate Risk Reduction Measures</li> <li>• Assets: B4 Incorporate Risk Reduction Measures</li> <li>• Environment: B1 Manage for Continuous Improvement</li> <li>• Reputation: B4 Incorporate Risk Reduction Measures</li> </ul>
	5.4.4.2	Liquefied Hazardous Chemical	Catastrophic failure of storage vessel releasing up to 250Te of liquid hazardous chemical	Un-ignited pressure burst causing spread of hot liquid and gaseous product Building damage, possibly extending offsite Enhanced combustion within gas cloud (contained offsite)	<ul style="list-style-type: none"> <li>• People: B5 Incorporate Risk Reduction Measures</li> <li>• Assets: B4 Incorporate Risk Reduction Measures</li> <li>• Environment: B3 Manage for Continuous Improvement</li> <li>• Reputation: B4 Incorporate Risk Reduction Measures</li> </ul>
	5.4.4.3	Liquefied Hazardous Chemical	Pipe failure between liquifier, refrig. unit and tank	Personnel overcome by effects of chemicals (Onsite effects only) Unisolatable gas release (gas cloud contained onsite)	<ul style="list-style-type: none"> <li>• People: B5 Incorporate Risk Reduction Measures</li> <li>• Assets: B4 Incorporate Risk Reduction Measures</li> <li>• Environment: B3 Manage for Continuous Improvement</li> <li>• Reputation: B4 Incorporate Risk Reduction Measures</li> </ul>
	5.4.4.4	Liquefied Hazardous Chemical	Pipe failure between tank and liquid pumps	Enhanced combustion within gas cloud (contained onsite) Slow release of tank contents	<ul style="list-style-type: none"> <li>• People: B5 Incorporate Risk Reduction Measures</li> <li>• Assets: B4 Incorporate Risk Reduction Measures</li> <li>• Environment: B3 Manage for Continuous Improvement</li> <li>• Reputation: B4 Incorporate Risk Reduction Measures</li> </ul>
	5.4.4.5	Propane	Failure of Stored cylinders	Enhanced combustion within gas cloud (contained onsite) Vapour Cloud Explosion	<ul style="list-style-type: none"> <li>• People: B5 Incorporate Risk Reduction Measures</li> <li>• Assets: B5 Incorporate Risk Reduction Measures</li> <li>• Environment: B3 Manage for Continuous Improvement</li> <li>• Reputation: B4 Incorporate Risk Reduction Measures</li> </ul>

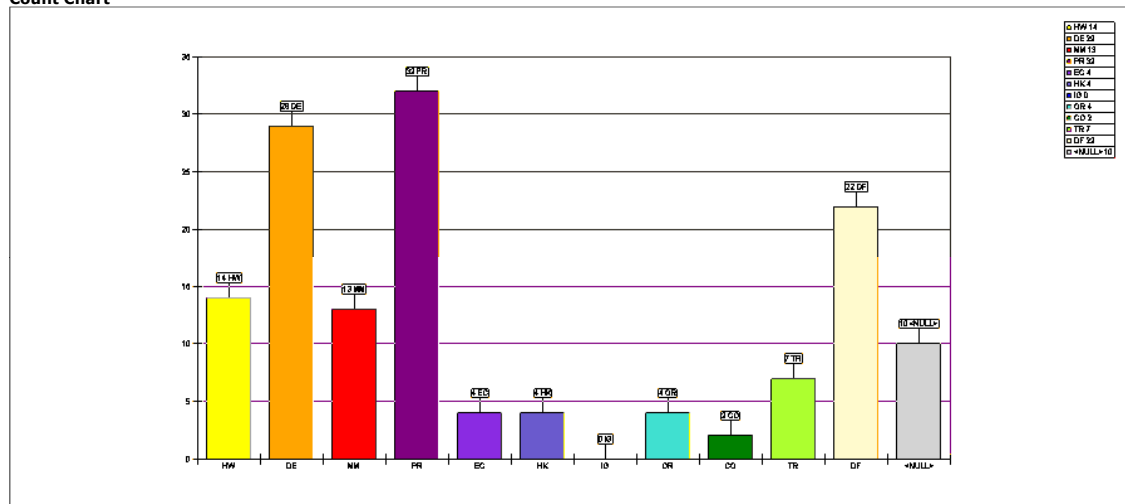
**Section L: Other**

**Report 3: Report on Control BRF Codes (UNFIN)**

**All Controls grouped by BRF code - Count Chart**

Case: 'Untitled'

Count Chart



**Section M:**

*Section M: Risk Assessment*

*Report 1: Consequences ordered by Risk Assessment*

**Location: Hazardous Site**

**Hazard: 5.4.4.1 Overheated Chemicals**

	<b>RiskCategory</b>	<b>Consequence</b>	<b>Value</b>
<b>People</b>	Incorporate Risk Reduction Measures	Projectile damage to product bulk storage	C4
<b>Assets</b>	Incorporate Risk Reduction Measures	Projectile damage to product bulk storage	B4
<b>Reputation</b>	Incorporate Risk Reduction Measures	Projectile damage to product bulk storage	B4
<b>Environment</b>	Manage for Continuous Improvement	Projectile damage to product bulk storage	B1

## Section M: Risk Assessment

### Report 2: Report Risk Assessment Matrices

#### Location: Hazardous Site

#### Hazard: 5.4.4.1 Overheated Chemicals / Catalyser Explosion

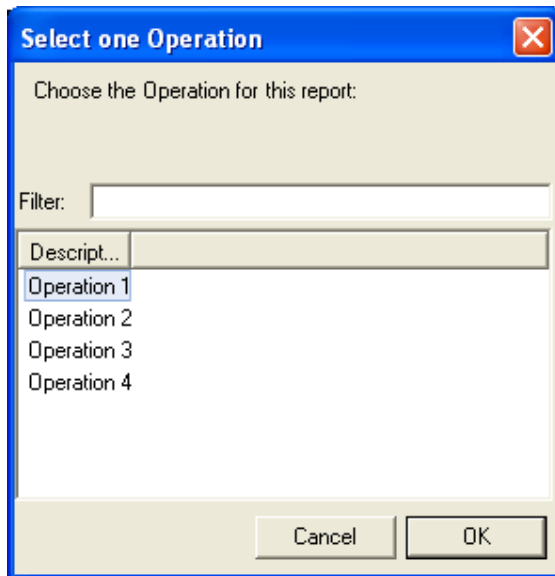
Consequence	Assessment	Value/Risk Category
Projectile damage to product bulk storage	People	C4: Incorporate Risk Reduction Measures
Projectile damage to product bulk storage	Assets	B4: Incorporate Risk Reduction Measures
Projectile damage to product bulk storage	Environment	B1: Manage for Continuous Improvement
Projectile damage to product bulk storage	Reputation	B4: Incorporate Risk Reduction Measures

## ADVANCED REPORTS - DETAIL

## Advanced, Section B

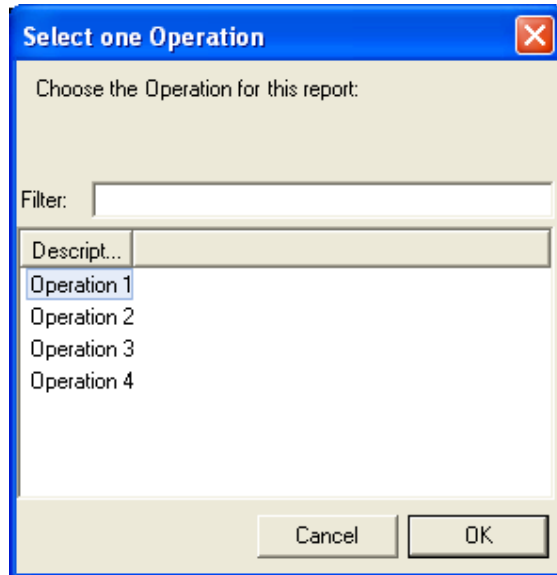
### *Advanced, Section B: Activities*

### *Report 10: Activities of a specific Operation grouped by Activity.Responsible (Long Version)*



**Advanced, Section B: Activities**

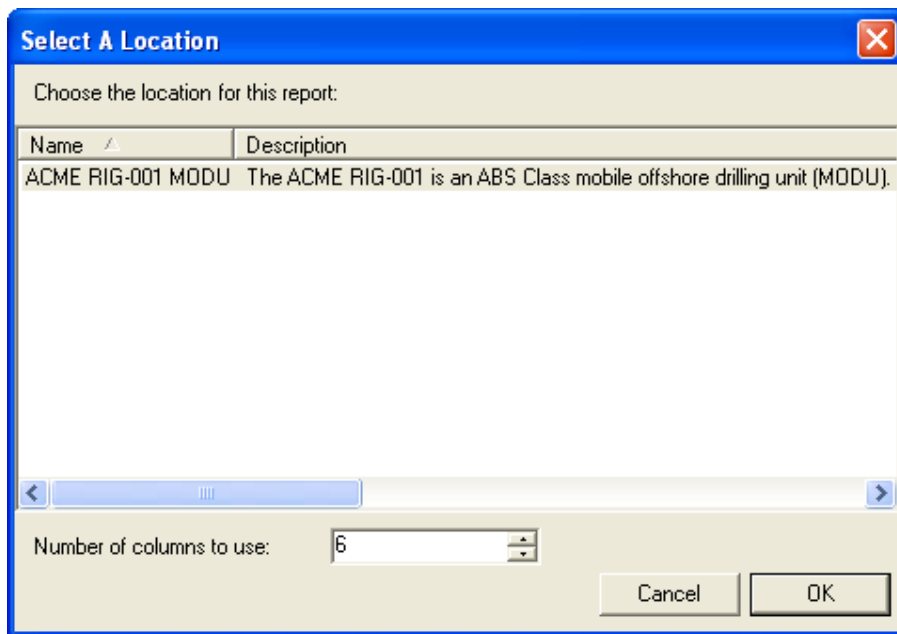
**Report 11: Activities of a specific Operation grouped by Activity.Responsible (Short Version)**



## Advanced, Section C

### *Advanced, Section C: Barrier Types*

#### *Report 1: Barrier Type count of a Location*



Select A Location

Choose the location for this report:

Name	Description
ACME RIG-001 MODU	The ACME RIG-001 is an ABS Class mobile offshore drilling unit (MODU).

Number of columns to use: 6

Cancel OK

## Advanced, Section D

### Advanced, Section D: Barriers

#### Report 1: Barrier Register

<i>Barrier</i>	<i># Times occurring</i>
Active fire protection	
(Haz.) H4 Flammable substances present on the installation / Large scale fire / explosion on the rig // (Cons.) Damage to asset // (Bar.) Active fire protection	
Adequate lighting in well test area - enables reading of gauges	<b>2</b>
(Haz.) H2 Hydrocarbons during well testing / Large scale uncontrolled release of hydrocarbons from well testing equipment at the surface // (Cau.) Activation of the pressure relief valve // (Bar.) Pressure gauges // (Def.) Gauges read incorrectly // (Bar.) Adequate lighting in well test area - enables reading of gauges	
(Haz.) H2 Hydrocarbons during well testing / Large scale uncontrolled release of hydrocarbons from well testing equipment at the surface // (Cau.) Pressure vessel failure // (Bar.) Pressure gauges // (Def.) Gauges read incorrectly // (Bar.) Adequate lighting in well test area - enables reading of gauges	
Adjust / control RIH tripping speed	
(Haz.) H1 Hydrocarbons in formation during drilling operations / Influx of hydrocarbons to the surface // (Cau.) Well kick // (Bar.) Maintain hydrostatic head (Primary Well Control) // (Def.) Surging // (Bar.) Adjust / control RIH tripping speed	
Adjust / Maintain trip speed	
(Haz.) H1 Hydrocarbons in formation during drilling operations / Influx of hydrocarbons to the surface // (Cau.) Well kick // (Bar.) Maintain hydrostatic head (Primary Well Control) // (Def.) Swabbing // (Bar.) Adjust / Maintain trip speed	
Adjust mooring pattern to suite extreme weather condition as defined in the mooring analysis	
(Haz.) H11 Rig moored on location / Station Keeping Failure // (Cau.) Environmental conditions leading to drifting // (Bar.) Mooring System // (Def.) Extreme weather conditions // (Bar.) Adjust mooring pattern to suite extreme weather condition as defined in the mooring analysis	
Adjust trim of rig using ballasting system	
(Haz.) H8 Shipping traffic operating in the vicinity of the rig on station / Shipping traffic collision with rig // (Cons.) Flooded Compartments (e.g. Ballast tanks, void tanks, etc) // (Bar.) Adjust trim of rig using ballasting system	
Aircraft beacon on rig	
(Haz.) H7 Helicopter transporting people to and from the rig / Crash // (Cau.) Heavy weather / low visibility // (Bar.) Aircraft beacon on rig	
Aircraft flotation / life-rafts	
(Haz.) H7 Helicopter transporting people to and from the rig / Crash // (Cons.) Crash into ocean // (Bar.) Aircraft flotation / life-rafts	
Alarm is tested during well testing pressure test	
(Haz.) H2 Hydrocarbons during well testing / Large scale uncontrolled release of hydrocarbons from well testing equipment at the surface // (Cau.) Activation of the pressure relief valve // (Bar.) Over pressure alarm // (Def.) Over pressure alarm fails // (Bar.) Alarm is tested during well testing pressure test	
All pressure vessel maintenance is controlled by Permit To Work	

## Advanced, Section D: Barriers

### Report 2: Barrier Responsible context overview

## All Location Personnel ( )

### H2 Hydrocarbons during well testing / Large scale uncontrolled release of hydrocarbons from well testing equipment at the surface

All Location Personnel is the Responsible party of the following Barriers:

Follow JSA process	
(HAZ.) H2 Hydrocarbons during well testing / Large scale uncontrolled release of hydrocarbons from well testing equipment at the surface (CAU.) Dropped object impact on well test equipment (BAR.) SOOB Restrictions during live well test (DEF.) Policy is ignored (BAR.) Follow JSA process	
Barrier type:	L3 - Perform and Monitor
Effectiveness:	- Poor
Brf code:	PR Procedures
Responsible:	All Location Personnel

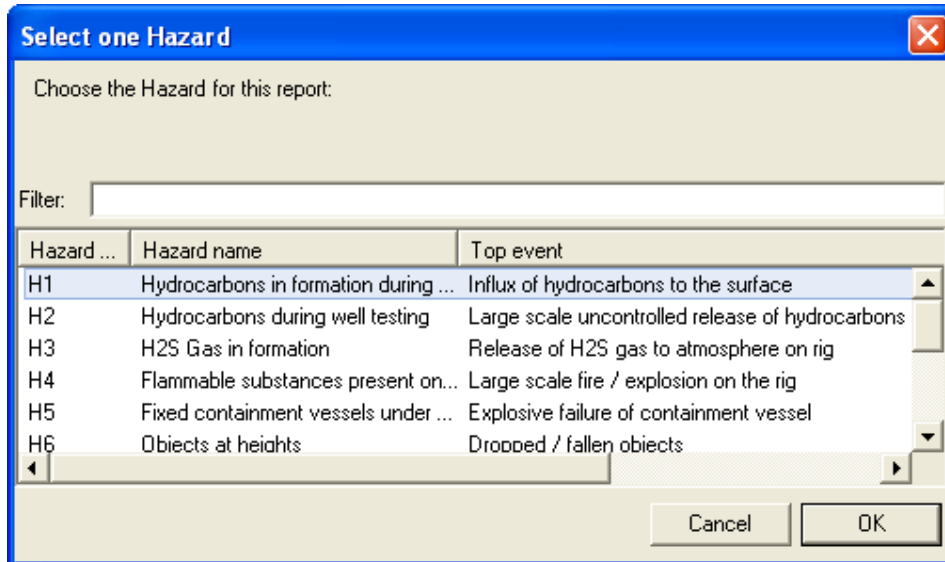
*No associated Barriers Activities*

Follow JSA process	
(HAZ.) H2 Hydrocarbons during well testing / Large scale uncontrolled release of hydrocarbons from well testing equipment at the surface (CAU.) Leaking pipework (BAR.) Pipes secured to prevent whip impact (DEF.) Pipes not secured / not secured correctly (BAR.) Follow JSA process	
Barrier type:	L3 - Perform and Monitor
Effectiveness:	- Poor
Brf code:	PR Procedures
Responsible:	All Location Personnel

*No associated Barriers Activities*

**Advanced, Section D: Barriers**

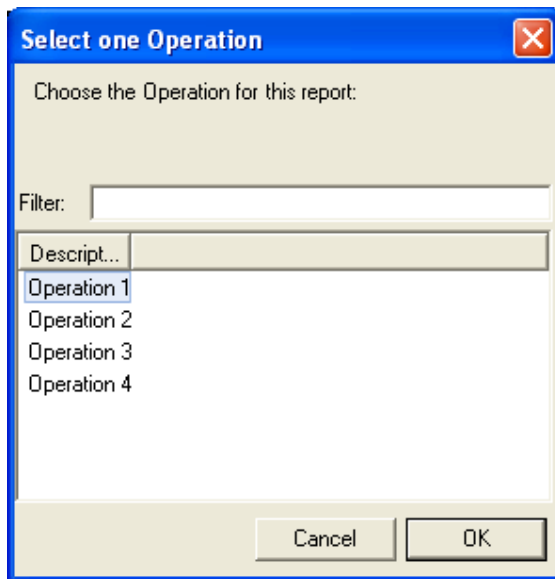
**Report 3: Barrier Responsible context overview of a specific Hazard**



## Section F

### *Advanced, Section F: Competencies*

#### *Report 1: Required Competencies for a specific Operations, grouped by Activities*



## Section G

### *Advanced, Section G: Defeating Factors*

#### *Report 1: Defeating Factors sorted by Barrier Type*

## Defeating Factors sorted by Barrier type

### Case: 'Offshore Drilling Demo (NOT FOR PRINTING - DISPLAY DEMO ONLY'

#### Defeating Factors with Barriers of Barrier type 'L3 - Establish Governance'

Location: ACME RIG-001 MODU

Hazard: H3 H2S Gas in formation / Release of H2S gas to atmosphere on rig

Cause: Mud returns

Barrier: Usage of scavenger chemicals in mud

Defeating Factor: Incorrect quantity used

**Barrier: Supervision by the Client Well Site Supervisor**

Location: ACME RIG-001 MODU

Hazard: H4 Flammable substances present on the installation / Large scale fire / explosion on the rig

Cause: Ignition of helifuel

Barrier: Proper storage and handling of helifuel

Defeating Factor: Helifuel not stored correctly

**Barrier: Training and competency of the Helicopter Landing Officer**

Location: ACME RIG-001 MODU

Hazard: H8 Shipping traffic operating in the vicinity of the rig on station / Shipping traffic collision with rig

Cause: Navigation failure of commercial shipping traffic

Barrier: Issue notice to mariners with rig location

Defeating Factor: Not issued

**Barrier: SAR regulator contacts rig if final notice not issued by rig**

Location: ACME RIG-001 MODU

Hazard: H10 Rig under long ocean tow / Unplanned deviation from tow route

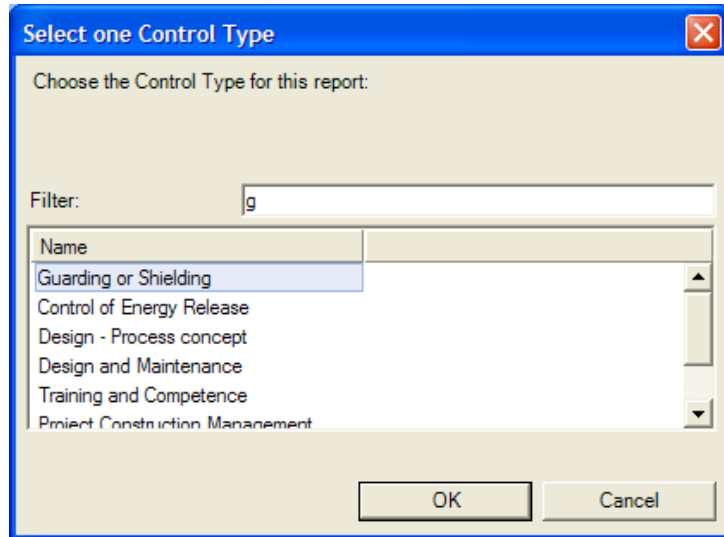
Cause: Rig drifting

Barrier: Rig towing arrangement

Defeating Factor: Towing bridles not properly secured

**Barrier: Training and competency of the Rig Marine Crew**

**Advanced, Section G: Defeating Factors**  
**Report 2: Defeating Factors with Barriers of type...**



**Escalation Factors with Controls of Control type 'Guarding or Shielding'**  
**Case: 'Sample Black BowTieXP based on Test (v364 on)'**

Location: Hazardous Site  
 Hazard: 5.4.4.3 Liquefied Hazardous Chemicals Used in Production Facility / Pipe failure between liquifier, refrig. unit and tank  
 Consequence: Unisolatable gas release (gas cloud contained onsite)  
 Control: Manual Isolation of leak, if accessible  
 Escalation Factor: NR valve fails  
**Control: Release restricted through 25mm pipe diameter as in Bow-tie 5.4.4.7**

Location: Hazardous Site  
 Hazard: 5.4.4.4 Toxic Chemicals in Storage Vessels in Production Facility / Pipe failure between tank and liquid pumps  
 Consequence: Slow release of tank contents  
 Control: Isolation of Leak  
 Escalation Factor: Isolation Valves cannot be accessed due to gas cloud  
**Control: PPE masks available to recovery personnel**

*Advanced, Section G: Defeating Factors*

*Report 3: Defeating Factors without Barriers (UNFIN)*

**Defeating Factors with No Barriers**

**Case: 'Offshore Drilling Demo (NOT FOR PRINTING - DISPLAY DEMO ONLY'**

**No results.** All Defeating Factors seem to have Barriers.

## Section I

### Advanced, Section I: IADC HSE Case Guidelines

#### Report 1: Hazard register complete

	Risk Rank People	Risk Rank Assets	Risk Rank Environment	Risk Rank Reputation	Risk Rank 5	Risk Rank 6
<b>Loc.: Hazardous Site</b>						
<b>Haz.: 5.4.4.1 Overheated Chemicals / Catalyser Explosion</b>						
<b>Th.: Inadequate design of plant</b>						
Ctl.: Main elements of plant designed by reputable provider of Chemical catalyser systems <i>Act.: W-1.1.01 Approve Plant Conceptual Design</i>						
Ctl.: Design (including Company aspects) approved by Company Design Authorities <i>Act.: W-1.1.01 Approve Plant Conceptual Design</i> <i>Act.: W-1.1.02 Detail design of Company designed parts of plant</i>						
Ctl.: Design subjected to Hazop review <i>Act.: W-1.1.05 Carry out detail safety studies on plant design</i>						
Ctl.: System materials appropriate for chemical service (See Manufacturers Scope of supply) <i>Act.: W-1.1.05 Carry out detail safety studies on plant design</i> <i>Act.: W-2.1.01 Sample LAN before delivery</i>						
<b>Cons.: Projectile damage to product bulk storage</b>	C4	B4	B1	B4		
Ctl.: See Controls for failure of bulk storage vessel Bow Tie Para 5.4.4.2						
<b>Cons.: Un-ignited pressure burst causing spread of hot liquid and gaseous product</b>						
Ctl.: Evacuation of work site on temperature runaway i.a.w. emergency op procedures <i>Act.: W-2.3.03 Control/monitor vessel Entry</i> <i>Act.: W-3.4.02 Execute Work Plan for Vessel Entry/ Maintenance</i>						
Ctl.: Activate Emergency Reponse plan <i>Act.: W-6.1.03 Escalated operator emergency response</i>						
<b>Cons.: Building damage, possibly extending offsite</b>						

**Advanced, Section I: IADC HSE Case Guidelines**  
**Report 2: Hazard register without Activities**

	<i>Risk Rank People</i>	<i>Risk Rank Assets</i>	<i>Risk Rank Environment</i>	<i>Risk Rank Reputation</i>	<i>Risk Rank 5</i>	<i>Risk Rank 6</i>
<b>Loc.: Hazardous Site</b>						
<b>Haz.: 5.4.4.1 Overheated Chemicals / Catalyser Explosion</b>						
<b>Th.: Inadequate design of plant</b>						
Ctl.: Main elements of plant designed by reputable provider of Chemical catalyser systems						
Ctl.: Design (including Company aspects) approved by Company Design Authorities						
Ctl.: Design subjected to Hazop review						
Ctl.: System materials appropriate for chemical service (See Manufacturers Scope of supply)						
<b>Th.: Improper construction of plant</b>						
Ctl.: Manufacturer employed to carry out on-site process plant construction activities						
Ctl.: No high pressure on-site pipe welding carried out on Manufacturer supplied equipment						
Ctl.: QA checks carried out on items manufactured offsite, with relevant documentation being provided to Company						
Ctl.: On-site welds (on Company provided systems) pressure tested						
<b>Cons.: Enhanced combustion within gas cloud (contained onsite)</b>						
Ctl.: Evacuation of worksite on indication of temperature runaway						
Ctl.: No smoking policy and monitoring to minimise unnecary combustibles						
Ctl.: PTW System and Safe System of work minimise ignition sources on site						
Ctl.: Activate Emergency Reponse plan						
<b>Cons.: Projectile damage to product bulk storage</b>	C4	B4	B1	B4		
Ctl.: See Controls for failure of bulk storage vessel Bow Tie Para 5.4.4.2						
<b>Cons.: Un-ignited pressure burst causing spread of hot liquid and gaseous product</b>						
Ctl.: Evacuation of work site on temperature runaway i.a.w. emergency op procedures						
Ctl.: Activate Emergency Reponse plan						
<b>Cons.: Building damage, possibly extending offsite</b>						

## Section K – Advanced Edition Only

### *Advanced, Section K: Operations*

#### *Report 1: Operations Overview*

## Operations Overview

### 1. Operation 1

#### *Associated Hazards*

5.4.4.1 Overheated Chemicals (Hazardous Site)

#### *Operation Associated Threats*

» Incorrect Chemical specification

#### *Operation Associated Consequences*

» Projectile damage to product bulk storage

» Un-ignited pressure burst causing spread of hot liquid and gaseous product

» Building damage, possibly extending offsite

5.4.4.2 Liquefied Hazardous Chemical (Hazardous Site)

#### *Operation Associated Threats*

» Vehicle Impact

» Mechanical failure

#### *Operation Associated Consequences*

» Enhanced combustion within gas cloud (contained offsite)

5.4.4.3 Liquefied Hazardous Chemical (Hazardous Site)

#### *Operational Risk Factors*

No associated Operational Risk Factors

#### *Activities*

No associated Activities

### 2. Operation 2

#### *Associated Hazards*

5.4.4.1 Overheated Chemicals (Hazardous Site)

5.4.4.4 Liquefied Hazardous Chemical (Hazardous Site)

#### *Operation Associated Threats*

» Vehicle Impact (Haz. 5.4.4.2 Liquefied Hazardous Chemical)

#### *Operational Risk Factors*

No associated Operational Risk Factors

#### *Activities*

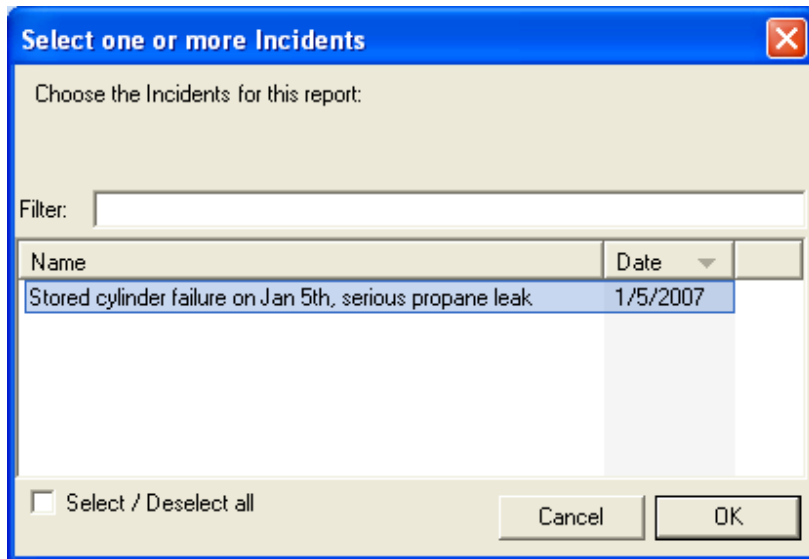
No associated Activities

STANDARD REPORTS – DETAIL

BLACK REPORTS - DETAIL

***Black, Section E: Black BowTie***

***Report 1: Common causes and contributing factors***



The dialog box is titled "Select one or more Incidents" and contains the following elements:

- Instruction: "Choose the Incidents for this report:"
- Filter: A text input field.
- Table with columns "Name" and "Date":

Name	Date
Stored cylinder failure on Jan 5th, serious propane leak	1/5/2007
- Checkbox: "Select / Deselect all"
- Buttons: "Cancel" and "OK"

***Black, Section E: Black BowTie  
Report 2: Single Incident Report***

