CABOT

CABOT CARBON LTD
SULLY MOORS RD
SULLY
VALE OF GLAMORGAN
CF64 5RP

ENVIRONMENTAL PERMIT BU2110IS
FUGITIVE EMISSIONS
ANNUAL REPORT CY2015

30th March 2016

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Introduction
Cabot Carbon Ltd is required to undertake an annual review of fugitive emissions at the installation in accordance with their Environmental Permit BU2110IS, requirement 4.1.4, which specifies:

"The Operator shall review fugitive emissions, having regard to the application of Best Available Techniques, on an annual basis, or such other period as shall be agreed with the Agency, and a summary report of this review shall be sent to the Agency detailing such releases and the measures taken to reduce them within 3 months of the end of such period."

The CY 2015 fugitive emissions report addresses fugitive emissions from the permitted installation to air, water and land, having regard to best available technique (BAT) and the measures taken by Cabot Carbon Ltd to reduce them. The Annual Fugitive Emissions data table CY 2015 is also attached for reference.

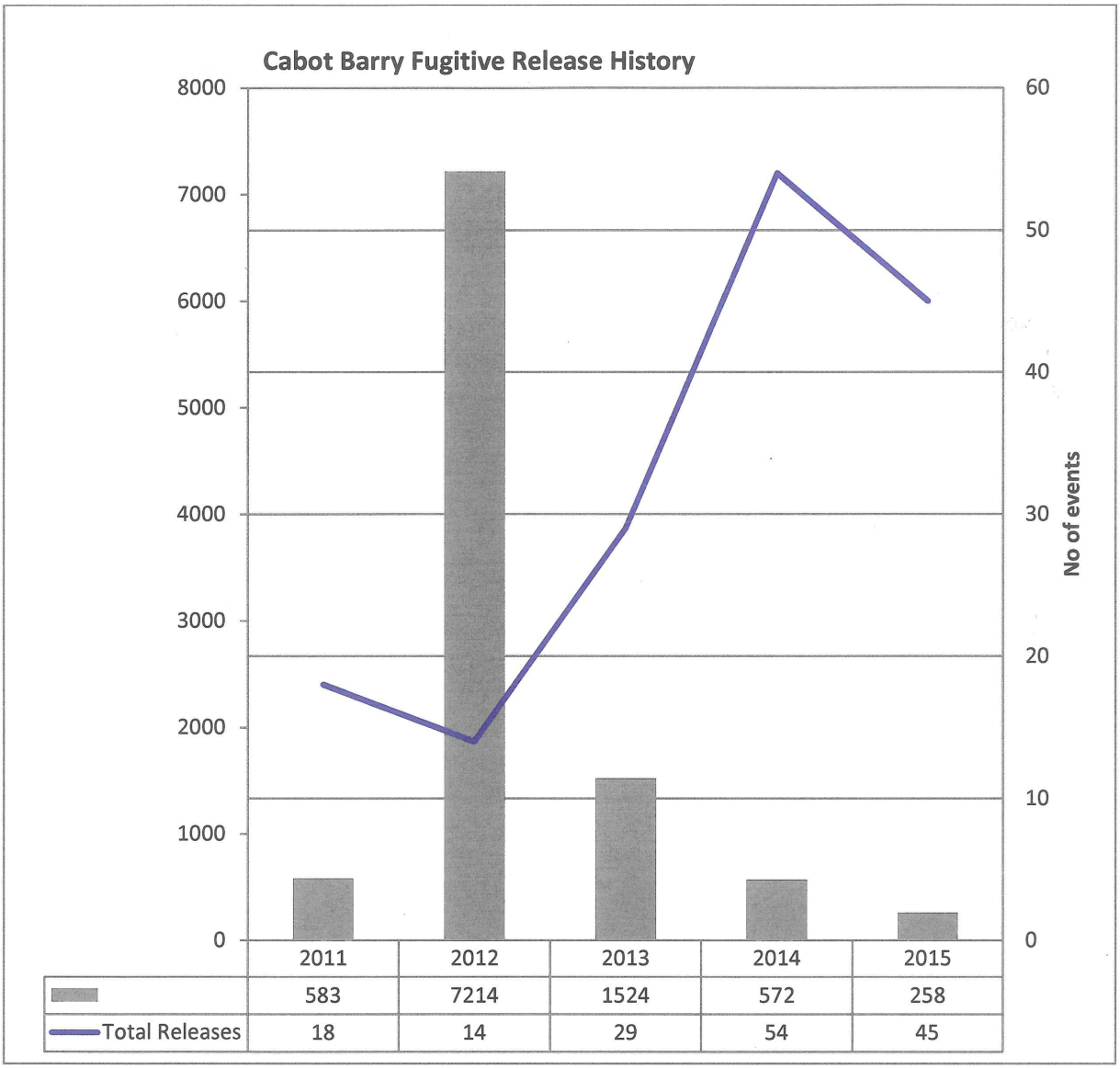
Highlights:
There were no fugitive emissions reportable to NRW in the year 2015. There were 45 releases across 12 categories totaling only 278 kg, almost half the quantity reported in 2014. (In 2013 there were 30 releases totaling 1,524kg). There was only 1 event from 45 where loss of containment quantity was excess of >200 kg. This event occurred in August 2015 during tanker loading where silica was spilled to ground. As the release occurred inside the loading canopy there was no environmental impact. The root cause was the failure of a rubber hose at the rear of the tanker which was was found to be loose. Being loose, the hose was unable to sustain the pressure that the tanker is required to hold for the particular silica grade being loaded and the spill occurred. Across the 9 other tanker loading related release events, silica loss totaled only 6kg. Although environmental impact of the large volume release was low, there is known history with Cabot's existing Haulier regarding previous silica emissions due to faulty or damaged equipment. Cabot has secured a contract with a different Haulier from March 2016 and is expecting a reduction in releases relating to tanker loading.

The highest frequency of reported events was loss of AHCL from 11 events totaling only 0.57kg. The releases were, in the main, attributed to issues with the Roots Blower. A new design engineering solution has been agreed with Roots system to improve the gas seal vent flow and restrict the gas flow through the cartridge lip seal into the gearbox. This modification is being carried out to the unit which at the time of writing is currently at Roots Systems for a service and will be returned to site May 2016. This design requires minimal engineering modification to all 4 cartridge seals and should be a positive step forward in improving reliability in 2016.

Fugitive Release Breakdown:

2015	Quantity kg	No. Fugitive Releases	Form
Fumed Silica	206.5	10	Solid
Hydrogen	32	2	Gas
HCL	11.3	8	Liquid
Lab Solvent	2.5	1	Liquid
Water treatment Chem	2	1	Liquid
Sodium Hydroxide	1	2	Liquid
Synthetic/Mineral Oil	0.81	4	Liquid
AHCL	0.6	11	Gas
Diesel	0.5	1	Liquid
PDMS oil	0.11	2	Liquid
Therminol Oil	0.1	2	Liquid
Ammonia	0.01	1	Gas
Total	257	45	

Quantities Released	Freq
~/<10ml	14
~/<100ml	15
~/<200ml	2
~/<500ml	2
~/<1L	3
~/<5L	7
~/<10L	0
~<30L	1
~<500L	1
>500kg<1000L	0
Total No. of Fugitive Events	45


Cabot Barry Fugitive Release History
8000
7000
6000
5000
4000
3000
2000
1000
0
60
50
40
30
20
10
0
No of events
2011 2012 2013 2014 2015
583 7214 1524 572 258
Total Releases 18 14 29 54 45

Summary

We endeavor to demonstrate continual improvement, striving for zero leaks. Improvement programmes and corrective actions have been initiated or completed in support of our ongoing commitment to environmental compliance. These were discussed in October 2015 at the NRW site visit and acknowledged in recent CARs received:

1) Responses to questions raised in CAR Report ID: BU2110ISSI/20151005 in support of fugitive release mitigation (NRW requested if Cabot could determine if the 2014 Caustic Soda D-13 incident was repeatable in any other flow orifice locations on site. Records of flow orifice plates were not up to date):

January 5th 2016 update by Cabot Mechanical Engineer:

- P&ID and site walk through conducted to locate all flow orifice plates on site (93 in total)
- Flow orifice plates numbered and added to Master Equipment Special Items List (including P&ID#, Orifice size, Line Service, Line#, Pipe Spec, Distance to downstream elbow)
- All flow orifice plates confirmed to be 3 pipe diameters or more from the next downstream elbow, therefore no repositioning is required.
- All P&IDs have been marked up to show location of flow orifice plates and note the orifice size.
- High level of confidence that this event is not repeatable.

2) The ABB gap analysis on the H2 plant and Critical Pipework and Pump Replacement Programme discussed and acknowledged by NRW.

- The recommendation from NRW on assessing potential fugitive losses for each substance has been noted and responses to requested actions in report ID: BU2110ISSI/20151005 shall be submitted by their due date.

- We continue to learn from every incident and share such learnings across the entire network of Cabot facilities. There have been no other notable reported fugitive releases during the reporting period that warrant further comment.

*** Cabot Barry: 5 years 3 months since last ENC (@ 30th March 2015) ***

Incident ID #	Incident Date/Time	Description	Primary Root Cause	Root Cause Summary	Lessons Learned	Spill Substance	Spill Amount
42481	12/29/2015	The braided hose that connects the PDMS tote for D63/64 to the process was showing signs of a small leak and subsequently needed replacement. Work Order# 3995943 was raised, a new hose sort from the stores and this was changed immediately.	Inadequate Design/Engineering	Worn hose	Replace hose, increase inspection	PDMS Oil	0.01
42419	12/29/2015	The braided PDMS supply hose to D63/64 holding tank TK-22 had failed and was dripping. It was dripping to a bund area so there was no loss of containment. Changed the hose	Inadequate Design/Engineering	Worn hose	Replace hose, increase inspection	PDMS Oil	0.1
41617	12/07/2015	The inlet line end to Nalco 3DT265 pump found off the pump inlet nozzle with some contents of the holding IBC being discharged and contained into the closed secondary containment bund/box. The leaked water treatment chemical which was held inside the closed secondary bund was pumped back into the holding IBC and the inlet disconnected line was made good and reconnected to the pump. System was put back on line as normal after repairs with no further issues.	Equipment Malfunction	It appears that the associated pump had a small blockage at some stage which created some added pressure on the plastic flex line and caused the line to come off the inlet point. Pump was cleaned and line end was renewed. System put back on line with no further issues.	Blocked pump and lines were cleared and some lines were renewed. This is an issue associated with low temps as chemicals tend to gel at low temps. A project has been raised to enclose the Nalco compound with heating system. Project money has been agreed to go ahead in 2016.	Water Treatment Chemical	2
41596	12/07/2015	Fumed silica leak occurred on top hatch of tanker when put under pressure (BKBU7651109) Loading stopped immediately and pressure released .	Equipment Malfunction			Fumed Silica	0.1
41272	11/26/2015	It was noticed when Broekema BKBU 465114-0 was loading M5 even before it started pressurizing that there were wisps of silica coming out of the top manual relief valve. Loading stopped, valve removed and inspected (see photo's), to find that the seal was damaged and that there was also damage on the lip that connects to a blank which was passing. We had to take another screw piece off another part of the tank, PTFE & screwed on top of tank (see pic), pressure test with soapy water which passed then continued to load. Haulier complaint raised	Maintenance - Inadequate or improper Maintenance	Worn parts	Haulier to repair/fit new parts	Fumed Silica	0.1
41049	11/20/2015	Small AHCL seal leak while starting the blower.	Inadequate Design/Engineering	Replaced a quarter inch push fitting on nitrogen to the blower seals	Asset life replacement needs to be investigated as line is 23year old	AHCL	0.1
40804	11/13/2015	It was noticed there was traces of Diesel on the roadway adjacent to the Plant Air compressor. The area was cleaned with spill kit absorbent pads and disposed of in the relevant manner.	Maintenance - Inadequate or improper Maintenance	Poor Maint	Vendor pm to continue to keep equipment to correct standard	Diesel	0.5
40317	10/27/2015	loading M5 tanker then with ~200kg left to fill and at 0.9Bar, the flexi hose split attached to the tanker (see pic), WO raised to replace hose, area cleaned. Approx. 2kg silica spill Incident report cloned to reprioritize and enable further actions and follow up by Maintenance manager	Inadequate Design/Engineering	Pipe and pipe fittings incorrectly attached.	The pipe fittings are not the correct size to connect to the flexible pipe work.	Fumed Silica	2
40089	10/27/2015	Tanker BKBU 465111-4 was being loaded under pressure when a silica whisp was notice by Matt coming from a manually available relief valve, pumping shut down, driver 'robbed' another cap from a part of the tank which sealed it. This is another occurrence with Broekema! Haulier complaint raised, Francois Zehr informed	Maintenance - Inadequate or improper Maintenance	Part missing on tanker	Change Haulier	Fumed Silica	0.01
39434	10/13/2015	Whilst installing new gratings around the Ammonia compressors, I have noticed several leaks. These leaks are coming from heavily corroded instrument pipe. On closer inspection, both compressors require new instrument piping and gauges before a failure occurs.	Maintenance - Inadequate or improper Maintenance	The pipe work in question was inspected and found to be corroded. The inspection of this line is now part of the J&E Hall pm and a work order was raised to replace the problematic pipe. The leak was minute and thus little or no ammonia escaped, no top up needed. We have asked J&E Hall to replace all sections of pipe work on the ammonia compressors as a precaution. We are waiting for quote and will action this as soon as received.	Full inspection needed on all parts of compressor system.	Ammonia	0.01

Incident ID #	Incident Date/Time	Description	Primary Root Cause	Root Cause Summary	Lessons Learned	Spill Substance	Spill Amount
39268	10/07/2015	An acid leak was found on the 32% feed to the top of the Nitrogen Stripper. The leak was dripping down onto the local scaffolding and down to ground level near the stripper sump. Shift manager was informed and after closer inspection it was revealed to be originating from a flange between a the flow transmitter and the line feeding the top of the Nitrogen Stripper column.	Maintenance - Inadequate or improper Maintenance	Loose connection around the leaking flange	Maintenance attended and tightened the nuts around the leaking flange. The acid leak quickly abated and the area was washed down.	HCL 32%	1
39227	10/07/2015	During a walkaround of the acid area I observed a NaOH wet spot of flooring beneath the drain/sample point on T-5. Closer inspection revealed that there was a slow drip leak from the drain point. The valve was tightened and the dripping appeared to stop. The valve was operated recently to sample Caustic so based on this and the amount on the flooring the spill size is estimated at <1Kg. An additional observation is that this sample point has a screw fitting to allow an end cap to be fitted, but this end cap was not present.			Retighten valve connection and fit new end cap	NaOH	1
38491	09/17/2015	The tank farm North and South ASH detectors came into alarm. On investigating, D-30 (32% HCL Storage Tank) was found to be leaking from the seal of the top man way door. Maintenance tech was called and confirmed source of leak, which was due to corroded bolts not holding the seal securely.	Maintenance - Inadequate or improper Maintenance	Seal breach from corroded bolts	Replace corroded bolts	HCL 32%	0.1
37510	08/24/2015	ASH detector went into alarm on the ground floor NW of the acid structure. Acid fume could be seen coming out of the inlet of the online Venturi scrubber pump. A water hose was put on to reduce the fuming and the stand by pump (P29B) put online. Work Order#3923156 raised for further investigation	Maintenance - Inadequate or improper Maintenance	E-Line mechanical seal leaking due to seal holder is worn at end of life. Pump identified to be replaced and is captured in the pump replacement strategy for FY-16	Mechanical seal issues already known and acknowledged at Barry	HCL 32%	0.1
37484	08/21/2015	Acid leak noticed on D27 return to tanks line.	Maintenance - Inadequate or improper Maintenance	Failure of a jointed section on the GRP pipe, This joint is either an original application from installation (23 years) or a repair before 2000 when the current JDE maintenance system was brought on line. The leak was caused by a gradual erosion of the GRP resin which resulted in soaked GRP layers, allowing liquid HCL to drip from the pipe.	Overhead pipelines of strong acid should be routed within contained bunded area's and not above personnel walkways	HCL 32%	4
36868	08/03/2015	Broekema tanker BKBU4651114 was inspected on arrival and pressure test was carried out before starting the tanker to 1.60BarG. M5 Tanker lid was shut and the pressure on the gauge reached 0.65barg and the top valve on the tanker started to leak silica and spilt on to the top of the tanker and some on the floor. Action taken to stop pumps vac hose used to relieve the pressure and new cup fitted by driver. Visually estimated less than 3kgs.	Maintenance - Inadequate or improper Maintenance	Contract vehicle not fit for duty , elevated incident to shipping	Raise issue with Haulier	Fumed Silica	3
36721	07/28/2015	P-25A has been put on duty overnight causing the repeat failure of the mechanical seal and release of a quantity of 32%HCL. Last incident was post shutdown when pump was reset and primed with water. Spill quantity estimated <5Kg. This was contained within the acid structure bund and waste pit system	Inadequate Design/Engineering	P-25A/B are centrifugal single mechanical seal pumps. In this particular case, the pump has been started up and the backpressure on the seal has overwhelmed it and "Popped" the seal slightly out of position. In turn this has led to a weep of acid from the pump (contained in the bunded acid area). Root cause for this failure is inadequate design. There are operating procedures in place to start these pumps up "gently" with the discharge cracked and then gradually opened, but this measure simply reduces the failure frequency and is not a completely preventative measure.	Replace pumps with an improved design such as double mechanical seal with pressurised seal fluid, or a seal-less pump type is the only means to drastically reduce the risk of recurrence. This has been identified in the unit PHA and entered into the future capital plan	HCL 32%	4

Incident ID #	Incident Date/Time	Description	Primary Root Cause	Root Cause Summary	Lessons Learned	Spill Substance	Spill Amount
36516	07/22/2015	When Loading LM-150D Tanker it was noticed that Silica was exiting Tanker drain/ Vent line to grade. On closer investigation it was noticed the vent line had not been closed before loading. The tanker loading sheet had not been signed by the driver as it was a Brockema driver that put the Getron Tanker on the weigh bridge.	Procedures - Failure to follow procedures	Vent line had not been closed before loading	Tanker loading stopped and are cleaned up. The tanker was then loaded with no further problem	Fumed Silica	1
36484	07/21/2015	It was noticed at 6am this morning that there was a sign of a silica leak on the tanker loading area, then when WPS shift were saying how long it was taking to fill big bags, it was noticed a regular wisp of silica from base of filter on the pipework below TK-20.	Lack of Skill/Knowledge	Poor project installation and supervision.	This was repaired by Project fitters under BT's guidance.	Fumed Silica	0.1
36115	07/10/2015	Whilst checking solvent bottle stocks, a contained chemical spill was discovered in the bunding of the solvent cupboard. One 2.5L glass Winchester bottle containing waste GPC mixed waste solvents had shattered and the contents were spilled into the cupboard bunding. The permit desk and shift manager were notified immediately and the area was taped off while the clean up materials and correct PPE were obtained. A fresh facemask and filter cartridge was used in the clean up due to the presence of toluene in the solvent mixture.	Inadequate Leadership - Supervision	Summer when outside temperatures were high- Thermal expansion is the most likely cause.	The area was cleaned and the broken glass was removed. The lab procedure changed so that full waste bottles are no longer stored within the cabinets. The improvement made means that the full waste bottles are directly loaded in to a waste drum full of mikafill in the waste storage area - E46	Solvent	2.5
35774	07/01/2015	Therminol oil leak evident from north side of D64 jacket, witness marks seen on the ground underneath the leak. WO:3893466 raised	Maintenance - Inadequate or improper Maintenance	3/4 inch Y-type bellows sealed globe valve has in been installed on the plant since D64 was commissioned and was found to have a small leak from the stem. Valve nipped up mechanical tech, monitored and leak has stopped for the time being. A spare/replacement valve is being sourced and will be replaced during the next extended treated plant outage, expected w/c 3rd August	Replace pumps with an improved design such as double mechanical seal with pressurised seal fluid, or a seal-less pump type is the only means to drastically reduce the risk of recurrence. This has been identified in the unit PHA and entered into the future	Therminol Oil	0.1
35740	06/30/2015	The concrete support plinth below the day tanks is showing signs of acid erosion. The demin units were checked for leaks but none were evident but oozing and frothing coming from beneath the support plinth its self. There is also a very small pool of liquid around a support beam base and small pockets of acid visible in the protective flooring of the bund	Inadequate Design/Engineering	Known issue that identified in corporate audit.	Project in place repair/replace	HCL 32%	0.1
35662	06/28/2015	AHCl acid leak from Roots blower nitrogen seals. This also occurred on the previous shift and one of the four seal points had been blanked off (temporary MOC # BA-1363 raised). Desorption ramped down and maintenance tech called into repair blower. On call engineer contacted and has agreed that the rest of the seal points could be blanked off under the same MOC. Work order as already been raised to change the blower at the earliest opportunity.	Equipment Malfunction	New blower appears to have a premature failure of the none drive end gasket. Supplier has been on site and recommended that blower removed from service and they will refurbish. Site decision made to run blower to failure as cost impact large and little or minor safety risk.	Manufacture - added raised corrective request to control test prior to issue. Note: Blower is tested prior to dispatch and on initial testing no issues found.	AHCL	0.01
35646	06/28/2015	Outside man noticed leak on 3 X nitrogen seals to Roots blower when the blower was up to pressure. Informed shift manager and outside operators changed fittings but this did not work.	Inadequate Design/Engineering	This is a result of a failed seal. MOC raised to blank off and manage the issue.	Covered in previous IR. Manufacture - added raised corrective request to control test prior to issue. Note: Blower is tested prior to dispatch and on initial testing no issues found.	AHCL	0.01

Incident ID #	Incident Date/Time	Description	Primary Root Cause	Root Cause Summary	Lessons Learned	Spill Substance	Spill Amount
35583	06/25/2015	Whisping HCl was observed to be leaking through a gap in the bottom of the lagging on D-36 vessel during normal plant running.. The body was mopped clean of residual HCl. Once cleaned, the head is to be completely loosened and re-torqued up to manufactured guidelines. The vessel will then be subjected to a leak test before being put back into AHCl service	Procedures - Failure to follow procedures	The origin of the leak was identified as being from the main body joint of the vessel at the top section. When the bolts were slackened in preparation for re-torqueing, feedback was made that the bolts were very loose. The vendor has stated that a torque of 450ft lb was applied to this joint prior to shipping. Root cause would be either: - Initial torque was not applied by the vendor as expected - Torque has slackened on the joint over time. Either during transit, or during storage prior to installation	Review/Update of site procedures for supply of new vessels to ensure that joints torqued by vendor are then re-checked by Cabot staff upon installation	AHCL	0.01
35582	06/25/2015	On a plant walkaround an observation was made that the drain point on E-480 cross exchanger was leaking. The source of the leak was identified to be the tell-tale on the PTFE lined reducing piece. The leak was onto the acid resistant flooring that runs to the pit, so there are no environmental implications. A spare PTFE lined reducer has been sourced and the failed piece of line work has been replaced				HCL 32%	0.1
35552	06/24/2015	The anhydrous line on the gantry was found to be leaking from the last valve in line before DCL and from the flow meter FT-1176. Depressurized the line and tightened the flanges.	Maintenance - Inadequate or improper Maintenance	Maintenance had been carried out on this line during the annual shutdown and the equipment had been replaced and re-torqued. A leak test was conducted at 3.5 BarG with no visible issues, however this leak has shown that the line work was not torqued sufficiently to contain AHCl at 6.5BarG (Normal operating pressure)	High torque settings to be included in the piping standard and phased in over next 3 years. A1QX, A2QX, A8AX, A1AX, K4YX pipework standards torque settings to be provided for works carried out in June shutdown	AHCL	0.1
35405	06/21/2015	On starting the Tank farm pumps this evening P25B failed to start (overload trip) P25A was started as its standby but immediately the seals failed and a very small amount of HCL was emitted to the tank farm bund. P25A was shutdown and washed down, P25B overloads were reset and pump put online.				HCL 32%	2
35078	06/12/2015	Audit walk around with Site Env. Mgr identified oil on the chippings under the ammonia compressors, C-3A/B. Unclear whether this is historical or from recent service	Inadequate Design/Engineering	Pumps have been installed without a concrete bunding surrounding this area. One mitigation to prevent recurrence could be to ensure that spill matting is available prior to doing the job to ensure that any oil spill is caught, however the best practice fix would be to ensure that these pumps and other similar set-ups on site, are modified to be within a concrete bund.	A lack of following site procedures, or awareness of hazards has also been highlighted as the maintenance contractors performing this task did not report this as an incident. To prevent recurrence could be to ensure that spill matting is available before job begins,	Oil (Non Feedstock)	0.1
34934	06/09/2015	A minor oil spill from the hydraulic line on the seabulk unit, spotted early so very small amount spilled. Area cleaned and all oil contaminated rags disposed of correctly and seabulk unit sent away for repair.	Maintenance - Inadequate or improper Maintenance	Leak onto Cabot ground caused by non-Cabot vehicle.	Discussed with vendor	Oil (Non Feedstock)	0.01
34401	05/26/2015	A small oil leak is evident on D65 hot oil package (set point currently 326 DEG C) protective Guarding has also been removed from the unit.	Maintenance - Inadequate or improper Maintenance	Perhaps due to prolonged thermal cycling/expansion, the joint was seen to be leaking. Tightened up joint and leak stopped	Tightened up joint and leak stopped	Therminol Oil	0.01
33894	05/12/2015	The outside operator was carrying out a plant walk and noticed there were AHCL drips coming from the inlet of valve on the rootes blower. This is usually a dry line. The lagging was stripped back to reveal paint work that was blistered. The drip source was from ice formation on the inlet line was melting. Engineering support was called upon, by the time they arrived to inspect the pipework the blistering was worse. The AHCL blower was taken off load and purged with N2. The paint work was cleared back and this revealed three pinholes. Very small amount of AHCL was release and system was put onto N2 Purge back to absorption.	Maintenance - Inadequate or improper Maintenance	Repeat event of internal corrosion of the AHCL line. Previous failures have been upstream of this one. The line has not been replaced in its entirety since installation, therefore Root Cause is end of life failure.	Replace failed pipes in their entirety rather than "patch" fixing failed sections.	AHCL	0.1

Incident ID #	Incident Date/Time	Description	Primary Root Cause	Root Cause Summary	Lessons Learned	Spill Substance	Spill Amount
33104	04/21/2015	When doing an oil sample on GB-113, an oil leak was found at the NDE around the casing. On closer inspection it was noted that the tell tale hole at the back of the casing was passing air which signifies that the seal has gone and the unit will need replacing. It will not cause any contamination problems to the process but the oil level will need to be periodically checked, ideally every week on a Friday, to make sure that GB-113 has enough oil to prevent complete failure.	Maintenance - Inadequate or improper Maintenance	Failure of the NDE shaft seal was most likely caused by the restricted cooling water flow which occurred approximately 14months previously but not rectified (low flow alarm has been constantly active for this entire period). It is not possible to determine if this failure lead to/or was caused by an increased level of vibration, as both accelerometers fitted to the blower 'froze' at 75% output in Nov'14 without generating an alarm or being noticed by the Panel Operator	1. When using process cooling water as a coolant, local filters should be installed to prevent suspended solids blocking equipment/coolant pathways (now complete on GB-113/213 & planned on C-101A/B) 2. Once a fault of this nature has been identified, the opportunity to clear the blockage during a scheduled outage should not be ignored as the time/cost of the work is far less than the repair cost of the failed seal. 3. The PM for monitoring the oil/seal performance of the blower should be amended to include monitoring for oil mists being emitted from the breather vents as this could lead to a flammable/explosive atmosphere which could be drawing into the 'non-hazardous area', 355kW motor 4. Real-time vibration monitoring only has added value if the data is both monitored & acted upon if an unusual trend is identified	Oil (Non Feedstock)	0.5
33088	04/20/2015	Whilst inspecting burner flame after A-side load-up, the Plant Engineer & Senior Process Engineer could detect a faint & intermittent 'burnt gas' odour on burner floor around A2/A3 burners. Smell disappeared after a while but on checking the ATEX gas analyser, a hydrogen leak of increasing magnitude (started at 50 rising to 450ppm over several hours) can be seen on Stream 11. This leak was initially detected by the online sampling system when A-Side was taken from MAKELOAD to HEATLOAD & then dissipated once feeds put back on suggesting leak from an abatement BSV (main & mantle H2 was operational at all times & no valve movements)	Maintenance - Inadequate or improper Maintenance	Confirmed - leaking stem, pulled up and leak stopped.		Hydrogen	0.01
32860	04/15/2015	IE technician was carrying out PM on pH analysers for katalco unit and noticed a leak on pipework. Operator went to investigate and discovered leak was from pipework direct from caustic tower into katalco unit (in bunded area). Work order generated by I.E technician. Shift manager called to inform and decision made to insert spade into line as the line only a line to a sample/ drain point. This action carried out in order to allow plant to continue to run and a repair planned in at a later date. Faulty pipework identified with blue tag sodium hypochlorite solution	Maintenance - Inadequate or improper Maintenance	Root causes summarised as: - Maintenance due to initial failure of the line work requiring spade to be inserted - Procedures, as the spade that was inserted as a means of isolation had not been tagged or tracked correctly as per Cabot's procedures	A w/o was raised for for the line to be broken to identify whether it was a spade or an orifice plate in the line (see w/o: 3814095).	NaOH	0.05

Incident ID #	Incident Date/Time	Description	Primary Root Cause	Root Cause Summary	Lessons Learned	Spill Substance	Spill Amount
32265	03/31/2015	During a site walk, it was noticed that a small amount of hydrogen was escaping from the Hydrogen skid through the local vent pipe to atmosphere. It was found that the valve to the vent/purge pipe (Cabot line) was not firmly closed causing the small leak. The valve was immediately closed tight and the leak was stopped. The gauge on the trailer now reads 194bar remaining and was not in use at the time. (This event was raised as an NCR on the night shift of 29th Mar - NCR number MAR-15-9030, and after review, determined as a PSM event - details from the NCR captured here)	Procedures - Failure to follow procedures	Human error on behalf of BOC Tech at the time of delivery by not closing the vent valve tight following the purging & venting. The above was reported & discussed with BOC customer Service (Call Ref number 512300787, BOC customer Service Tech : Lauren Hulme) , and it will be discussed with other groups who are responsible for deliveries. Initially it was though to be a human error on behalf of BOC technician who install and swap over H2 trailers and part of bringing the new trailer on line is to vent & purge the line through a dedicated vent point. Will await feedback from BOC. Please see attached document for details and quantity of vented H2.	Valve was closed tight. BOC were informed with the error as this valve is mainly operated by BOC Tech and the tech was informed. At a later stage a check sheet was put in use to include all critical items to be checked at the time of delivery.	Hydrogen	32
31220	03/04/2015	On shift handover an ASH 045 alarm activated around the Roots Blower, on investigation a leak was found around the same area as the previous leak (03/03/15). Ramped feeds off from the Dow Corning TCS plant and began to purge blower while trying to locate exact location of the leak. Shift Manager called out on call mechanical technician and the reliability engineer to assist/trouble shoot problem. Very small release approx. 0.01kg	Inadequate Design/Engineering	Roots failed to install proper blank on bottom of blower. Added to Roots checklist.	Detailed inspection.	AHCL	0.01
30620	02/18/2015	At 01:20 the panel Operator had two ASH Detector alarms go into alarm. AIA-029 First Floor North east and AIA- 018 Ground Floor East. The Outside Operator went to investigate and found there was an HCl leak coming from the base of B Desorber tower (Instrument T Piece. A decision was made to shut down both desorbers and depressurise through PIC-123B. Started the water washing of B Desorber Tower to prepare for maintenance. The on call manager was informed, Maintenance Technician checked for a spare available before spading off the Tower and running on A Tower.	Maintenance - Inadequate or improper Maintenance	Failure of the PFA lining of the 6" Equal Cross carbon steel pipe section		AHCL	0.01
30236	02/08/2015	Ash detector (AIA-043) alarmed on the DCS near to the Roots Blower. On investigation noticed a gas/vapour leak coming from the same 2" flange from the previous incident (07/02/15). Again it was tightened but was unable to stop leak. Desorption ramped down/vented and all the isolations put in place. This time it was decided to change the ball valve and reducer spool located underneath pressure pad.	Maintenance - Inadequate or improper Maintenance	On investigation noticed a gas/vapour leak coming from the same 2" flange from the previous incident (07/02/15).	Maintenance task carried out, checks confirmed repair OK.	AHCL	0.01
30224	02/07/2015	Whist day operator was loading the M5 tanker, coming towards the end of its fill a small silica leak was seen at the body of PRV 2809 (Please see attached photos). Tanker pressure was 1.44 Bar at the time. Approximately 100 grams of Silica was released. Day operator stopped pumps immediately and reported to Shift manager Tanker load was 200 Kg light of full weight when loading was aborted	Inadequate Design/Engineering	The bursting disc below the PRV had popped following repeated pressure test - failure to identify this issue at design.	System has been modified to include two independent pressure switches as an alternative to the PRV. Equipment being succesfully used by operations	Fumed Silica	0.1
30223	02/07/2015	Ash detector (AIA-045) alarmed on the DCS around the Roots Blower on investigation noticed a small vapour/gas wisp coming from the discharge line, on a 2" stabbing underneath pressure pad.	Inadequate Design/Engineering	Attempted the tighten up to no avail. Desorption ramped down from DCL and system vented and prepped ready for maintenance. Maintenance task carried out and locks removed. Desorption/Roots blower restarted on acid duty while monitoring repair. Checks confirmed repair was OK. Continued to ramp back up to DCL. Vapour/gas release approximately 0.2 kg		AHCL	0.2
30104	02/04/2015	Around 10:30am, AIA-045 (HCl detector) came into alarm with a high reading and on inspection a small leak was found on C-9A (Roots blower). Due to a leak found on C-9A (Roots blower) both trains were off-loaded and Desorption was tripped.	Maintenance - Inadequate or improper Maintenance	Failure of weld on discharge pipework branch	Repair weld	AHCL	0.01

Incident ID #	Incident Date/Time	Description	Primary Root Cause	Root Cause Summary	Lessons Learned	Spill Substance	Spill Amount
30027	02/02/2015	An oil leak was visible around the plant air compressor unit on C6. Absorbant matting and granules have been laid down to contain the leak. Vendor has been called out and reported that the oil cooler will need replacement.	Maintenance - Inadequate or improper Maintenance	Faulty Cooler	Vendor pm to continue to keep equipment to correct standard	Oil (Non Feedstock)	0.2
29857	01/28/2015	Getron Tanker was put on the weighbridge By the Brockema driver and set up for loading by the shift Warehouse team. The Tanker started loading LM-150D from silo 3 and after approximately an hour it was noticed that there was Silica leaking from the Vent Valve on the top rear of the vehicle. The loading was instantly stopped and the valve was inspected using the Sea Bulk loading steps. The valve was found to be slightly cracked open and subsequently closed. A small quantity of silica was cleaned off the rear of the lorry and the loading was continued with no further issues.	Procedures - Failure to follow procedures	Procedures - Failure to follow procedures	Complaint to Haulier	Fumed Silica	0.1