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px LIMITED

BRAMHALL TERMINAL

FUNCTIONAL SAFETY COMMITTEE

MINUTES OF REVIEW – FEBRUARY 2017

Rev	Date	By	Checked	Approved	Description	Client Ref.
A	14.02.17	D. S. Regan	D.B. Faulkner	Client	Original Issue	
B	30.03.17	D. S. Regan	D.B. Faulkner	Client	Actions Updated and client comments added	
						Document No. SC021009_RPT

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Contents

1	REVISION HISTORY	3
2	ACTION STATUS	3
3	SAFETY COMMITTEE.....	9
4	MANAGEMENT OF FUNCTIONAL SAFETY	10
4.1	SIS Performance including any activations and false alarms.....	10
4.2	API 2350 – Overfill Protection for Storage Tank in Petroleum Facilities	11
4.3	SIS Testing, planning, results, data collection and analysis.....	12
4.4	Training requirements and roles and responsibilities of employees and contractors.	13
4.5	Review of organisation and resources.....	14
4.6	Outcome of Functional Safety Assessments and Outstanding Action status.	15
4.7	Review of any management of change or modifications to the systems.....	20
4.8	Review of any HSE or other agency visits.....	20
4.9	Competency	20
4.10	Critical Items Issues	21
4.11	Review Management of Functional Safety Documentation.....	21
4.12	Review of independent Instrumented Safety Functions.....	21
5	NEXT MEETING.....	22



Meeting Date 14th February 2017

1 REVISION HISTORY

Rev	Description
A	Original Issue
B	Actions Updated and client comments added Actions 4, 8, 26, 32 & 39 updated. Sam Milward's competency statement corrected.

2 ACTION STATUS

No.	Action	Action By	Status	
3	Modify testing documentation to include for improved analysis. Mark Saunders has produced new proof test procedures, procedures to be combined and kept at Terminal. Copies to be put into manuals	D. Faulkner	Ongoing	
	Date			Action History
	17/06/14 15/01/15 14/02/17			Test Procedures to be improved as per HSE recommendations. Ongoing Testing Documentation is unwieldy and requires a number of hard copies. 6 month testing can be carried out with reduced documentation as long as annual testing carried out with full documentation. As found and as left testing for tanks taken out of service may need a separate reduced procedure. Testing procedures, in this case, to be reference documents with a sign off sheet to confirm procedure followed.

No.	Action	Action By	Status	
4	Maintenance requirements for the Rotork actuator and valve is to be confirmed. June 2014 – Rotork only maintain the actuator, not the valve. Valve maintenance to be carried out, spares to be investigated. JCV to be contacted for regular checks/maintenance periods. E-mail of original valve details and JCV contact details supplied by DSR. Incorporated within V1 replacement in Q4 2015	S. Joyce	Ongoing	
	Date			Action History
	15/01/15 16/02/16 08/06/16 14/02/17 30/03/17			Action incorporated into V1 Replacement due Q4 2015 February 2016, new valve installed. Old valve to be refurbished. Inspection, seat and seal inspection and/or replacement, pressure test etc to be carried out. Report to be issued. DSR to produce a test spec by 5 th March. Test Specification Issued. Report issued by the contractor who completed the test. February 2017 - At last test, valve closure time was below the specified time. The required time is > 90 seconds and < 120 seconds. Further monitoring required. Actual minimum closure time required >45 seconds. Functional specification requirement >90 seconds, with tolerance, to enable V14 to close prior to ESD-V1. Rotork will be maintaining the actuator in March and will be requested to adjust closure to the required time if possible. Testing Contractor has issued pressure test report. Valve was in good condition. New Action – To confirm the cyclic maintenance requirements of V1.



No.	Action	Action By	Status
8	Analysis of testing and data collection is to be continued. Improved analysis is required. June 2014 - Action ongoing with improved test procedures.	D. Faulkner	Complete
	Date	Action History	
	17/06/14 15/01/15 16/02/16 14/02/17	Action ongoing with improved test procedures. Action Ongoing Improved test procedures with analysis documentation now issued, to be used for testing in 2016 Testing lifecycle analysis ongoing as part of procedues.	

No.	Action	Action By	Status
13	px to produce document control system.	M. Henesy	Ongoing
	Date	Action History	
	17/06/14 15/01/15 16/02/16 14/02/17	Action Ongoing, to be complete Quarter 2 2015. Action Ongoing Action Ongoing On hold due to terminal management changes pending.	

No.	Action	Action By	Status
14	Management team has been changed, further training to be carried out. Terminal to confirm. New Training Programme in place and ongoing.	D.S. Regan	Ongoing
	Date	Action History	
	17/06/14 16/02/16 14/02/17	Action considered complete. Action reopened, further SIS awareness training required for operational and maintenance personnel. Instrumented Safety Shutdown Systems to be highlighted in the training Programme and Plan. Certificates for trained personnel to be issued.	

No.	Action	Action By	Status
18	Ensure documentation completed and ensure Bramhall terminal management sign off documentation. (Action 8 from Tank Overfill FSA Stage 4).	D. Regan	Closed
	Date	Action History	
	17/06/14 16/02/16 08/06/16	DSR to issue to DW for signing and completion. Documentation to be issued on cloud based server to maintain status. Action Now Complete	



No.	Action	Action By	Status
24	It was noted that no modifications have been carried out since the previous meeting. However some Pilz relays has been changed out (like for like) and a report from Pilz is outstanding. The analysis and approval documentation is to be updated following the next test. Chase report from Pilz. June 2014 PILZ have not (and will not) issued a report as it is a safe failure. ACTION considered as complete. PILZ to be contacted outside this meeting.	D. Faulkner	Closed
	Date	Action History	
	28/10/13	Ongoing	
	17/06/14	Ongoing discussions with Pilz, PILZ have not (and will not) issued a report as it is a safe failure. Action considered as Complete	
	16/02/16	Action reopened, design change to be considered. Omron Relays for information outputs as replacements for Pilz S11 relays.	
	14/02/17	Design complete and relays changed over in 2016.	

No.	Action	Action By	Status
25	Environment Agency and HSE have visited the site in June 2014. ACTION S.M.	S. Milward	Complete
	Date	Action History	
	17/06/14	Actions, recommendations and comments from these meetings will be circulated to the Functional Safety Committee.	
	15/01/15	Inspection reports reviewed briefly at the meeting. Actions captured by terminal action tracker.	
	16/02/16	No CA inspection carried out in the last 12 months.	

No.	Action	Action By	Status
26	There is dedicated contractor support for local electrical and instrumentation issues, including the Safety Instrumented Systems. There is no back-up for this cover and electrical drawings may not be up to date. Knowledge base and cover to be considered.	S. Milward	Ongoing
	Date	Action History	
	15/01/15	Methods of addressing this weakness have been considered and none are seen as particularly viable. Documentation to be confirmed as complete and up to date.	
	16/02/16	Extra support has now been identified and documentation to be upgraded. IS Calculations need to be provided as per DSEAR loop sheets required as part of documentation upgrade.	
	14/02/17	IS calculations and loop sheets now completed.	
	30/03/17	Contractors are now being introduced to site operations and maintenance to gain site knowledge. A proposal for the recruitment of an electrical technician was submitted to P66 in 2016, however this has now been overtaken by the imminent transition to CLH. Future arrangements are TBC	



No.	Action	Action By	Status
27	BC&T to update and provide Cause and Effect Document for review.	S. Milward	Ongoing
	Date	Action History	
	15/01/15 16/02/16 14/02/17	Action Ongoing Due for completion Quarter 2 2016. PX are reviewing existing document for effectiveness. Revised document to be reviewed and issued in 2017.	

No.	Action	Action By	Status
31	On Gantry SIS, Safety Relays have not been used for closing the final element. Omron Relays to be changed out for PILZ Safety Relays.	D. Faulkner	Ongoing
	Date	Action History	
	15/01/15 16/02/16 14/02/17 30/03/17	New Action Action Ongoing Gantry shutdown valves to be controlled via safety relays. Discussions with original designer to be held to confirm extra wiring to relays not shown on SIS drawings. Marked up drawings showing the problem to be issued to px. Design required to allow for new standalone safety relays for GSVs. Archived documentation may need modification. Quotation issued for modifications.	

No.	Action	Action By	Status
32	Review Management of Functional Safety Documentation and upgrade as per current standards.	D. Regan / S. Millward	HOLD
	Date	Action History	
	15/01/15 16/02/16 14/02/17	New Action FSM documentation to be proposed FSM documentation issued by P&I to be reviewed to confirm suitability with px documentation. On hold pending future arrangements under CLH control.	

No.	Action	Action By	Status
33	There may be a requirement for an additional Safety Instrumented System on the VRU. To be reviewed.	D. Faulkner	Ongoing
	Date	Action History	
	16/02/16 14/02/17	New Action VRU SIS design complete, installation and testing required with FSA 3.	



No.	Action	Action By	Status
34	Rack 6 is not currently annunciated individually. Requirement to be confirmed.	S. Joyce	Closed
	Date	Action History	
	16/02/16 14/02/17	New Action Confirmed as operational on annunciator.	

No.	Action	Action By	Status
35	Login details for new Information Management system to be shared.	S..Milward	Closed
	Date	Action History	
	16/02/16 14/02/17	New Action Action closed, all information now available.	

No.	Action	Action By	Status
36	FSA 4 to be scheduled.	S..Milward	
	Date	Action History	
	14/02/17	New Action	

No.	Action	Action By	Status
37	Quote for FSA 4 to be issued.	D.S.Regan	
	Date	Action History	
	14/02/17	New Action	

No.	Action	Action By	Status
38	FSA 4 for SIS on Storage Tanks and Road Tanker Safety Instrumented Systems to be closed out.	D.S.Regan	
	Date	Action History	
	14/02/17	New Action	



No.	Action	Action By	Status
39	P&I Design competency to be issued to px.	D.S.Regan	Closed
	Action History		
	14/02/17 24/02/17	New Action Action complete, copy of competency management system and DSR training record issued to Sam Milward/Dave de Halle.	



3 SAFETY COMMITTEE

The purpose of the committee is for px, Bramhall Terminal to organise and control the facilities Safety Instrument Systems to ensure satisfactory operation and also compliance with the international standard BS EN 61511. P & I Design Ltd will provide additional technical assistance in achieving these objectives.

Sixth meeting 14th February 2017

Committee Members

Sam Milward	– px Ltd. Terminal Manager
Dave DeHalle	– Phillips 66 Terminal Engineer
Mike Bawden	– Phillips 66 Terminal Projects Manager
Mark Henesy	– px Ltd. Operations Superintendent
Steve Joyce	– px Ltd. Maintenance Coordinator
Ivan Harling	– Phillips 66 Terminal Operations Manager
David Regan	– P&I Design, CFSE
David Faulkner	– P&I Design, Instrumentation Engineer

Competency

SAM MILWARD is the Terminal Manager and a Mechanical Engineer with over 8 years' experience in military engineering operations and 4 years' experience in terminal operations.

MARK HENESY is a Civil Engineer, with over 25 years' experience in Operations.

DAVE DEHALLE is the Chemical Engineer. He has over 30 years' experience in refinery engineering and operations.

MIKE BAWDEN is the Phillips 66 Terminals project manager, he has a HNC in Motor vehicle engineering with over 20 years' experience in terminal operations and engineering.

STEVE JOYCE is a Marine Engineer. He has over 27 years' experience in marine engineering and over 5 years' experience in terminal operations and engineering.

IVAN HARLING is the Phillips 66 Terminals Operations Manager. He has 18 years' experience in Terminal Operations.

DAVID REGAN BEng is a Process Engineer with a degree in Chemical Engineering. He has specialised in Process Instrumentation for over 25 years and is a Certified Functional Safety Expert. He has been involved on many SIS projects including Risk Assessments and design.

DAVID FAULKNER is an Instrument Engineer with over 25 years' experience in the installation, testing and maintenance of Safety Instrumented Systems. He is qualified as a Functional Safety Specialist.



4 MANAGEMENT OF FUNCTIONAL SAFETY

Review of Previous Meeting minutes and actions.

February 2016 Meeting minutes – Actions reviewed and updated.

For minutes review, see comments below

Review Cause and effect diagram as discussed in Hazop. This could not be completed as the Cause and Effect diagram was not available. **OUTSTANDING ACTION – BC&T to update and provide Document for review. January 2015 - Still Outstanding, due for completion Quarter 2 2016. PX are reviewing existing document for effectiveness. February 2017 - Revised document to be reviewed and issued in 2017.**

Review of px, Bramhall Terminal Safety Instrumented Systems.

Hazop review to be carried out on 5th February 2016 to risk rank the criticality of actions and consequences - Now Complete.

4.1 SIS Performance including any activations and false alarms.

Storage Tank Safety Instrumented System

The system has now been operational since 2008 and since the FSA stage 4 there have been failures of two safety relays. Pilz have attended site to investigate, a report is now not expected. The relays have been separated and at present there have been no further failures. Also the ambient temperature within the panel will be reduced using small fans installed in the panel. Forced ventilation now installed. June 2014 – No further issues noted. February 2016 – Action reopened, design change to be considered.

June 14th - There have been no activations of the system due to high level since the previous meeting.

January 2015 - There have been no activations of the system due to high level since the previous meeting.

February 2016 - There have been no activations of the system due to high level since the previous meeting.

February 2017 - There have been no activations of the system due to high level since the previous meeting.

Activation of a level switch on tank 3 caused by pneumatic hammer local to tank top. System would not rest until relay was replaced. ACTION 6. To be investigated (Mark Jones/DSR). January 2015 – No further problems with new relay. Action Closed.

Road Tanker Gantry Loading Safety Instrumented System.

The system has now been operational since 2009 and no major problems have been noted.

There have been a number of spurious trips and activations of the SIFs. These are detailed in spreadsheets. The spreadsheets are held in paper form and are not held on computer.



Consideration is to be given to improving the completion and analysis of this documentation.

ACTION 1 – June 2014 - Now Complete

It may be that there is an issue at this terminal as there seem to be more activations than at other terminals. Rack 4 has had no spurious trips since March 2012.

It was discussed that the major source of activations is from the Scully showing fault.

ACTION 2 - June 2014 - Now Complete.

Rack No. Totals to date 2012 (February March and April data missing)

3	70 Spurious	55 activations (Not incidents, 5 arms on this rack)
4	15 Spurious	15 activations (Not incidents, 5 arms on this rack)
5	80 Spurious	80 activations (Not incidents, 8 arms on this rack including bioethanol)
6	70 Spurious	85 activations (Not incidents, 6 arms on this rack)

ACTION 5: NOW COMPLETE

May 2013, new activation log completed and Scully brought in to maintain and test the Scully systems and software. Since then total of 27 real (dirty connections, wet probes and low air pressure in pots) and 8 spurious activations, complete with incident number.

June 2014 - The Scully does not provide a hard wired system to close the SIS valve. Documentation and testing is under review.

January 2015 – Spreadsheet available, more activations in 2014 (81) than in May - December 2013 (5 genuine activations). These have mainly been activations of the vehicle level switches (26 near misses in 2014). No SIS overfills have been activated. (Note: Approx. 100 vehicle movements per day).

February 2016 - Spreadsheet available. Recording to continue (48 activations in the last 12 months – 6 genuine, spurious trips). Testing Documentation updated and issued.

February 2017 - Spreadsheet available. Recording to continue (155 activations in the last 12 months – 4 genuine, spurious trips). Testing Documentation updated and issued. These have mainly been activations of the vehicle level switches (26 near misses in 2016). No SIS overfills have been activated. (Note: Approx. 100 vehicle movements per day).

4.2 API 2350 – Overfill Protection for Storage Tank in Petroleum Facilities

Bramhall Terminal will produce an LOC review as per API2350.

LOC Complete, Review carried out and LOC issued formally and incorporated in Terminal Procedures. June 2014 - ACTION 7 COMPLETE.



4.3 SIS Testing, planning, results, data collection and analysis.

Annual SIS testing is ongoing and is now planned via the Q4 system. The testing of both SIS's was carried out November 2014. Level switches wet tested during testing to be recorded via the Q4 system to ensure all switches are tested at least once per 5 year cycle.

Analysis of testing and data collection is to be completed. Improved analysis is required. ACTION 8. January 2015 – Ongoing. February 2016 – Ongoing. Testing Documentation updated and issued.

ACTION 3 - Modify testing documentation to include for improved analysis. (P&I Design Ltd.) Mark Saunders has produced new proof test procedures, procedures to be combined. January 2014 - Ongoing. February 2016 Testing Documentation updated and issued.

February 2017 - **Testing Documentation is unwieldy and requires a number of hard copies. 6 month testing can be carried out with reduced documentation as long as annual testing carried out with full documentation. As found and as left testing for tanks taken out of service may need a separate procedure.**

NEW ACTION 29 - SIS Manual for Road Loading Gantries to be re-produced if this cannot be found on-site. February 2016 - Testing Documentation updated and issued. Action Complete.

ACTION 4 - Maintenance requirements for the Rotork actuator and Valve is to be confirmed (px). June 2014 – Rotork only maintain the actuator, not the valve. Valve maintenance to be carried out, spares to be investigated. JCV to be contacted for regular checks/maintenance periods. E-mail of original valve details and JCV contact details to be supplied by DSR. January 2015 – Costs for a replacement valve and installation have been obtained, for purchase Q3 2015. February 2016, new valve installed. Old valve to be refurbished. Inspection, seat and seal inspection and/or replacement, pressure test etc to be carried out. Report to be issued. DSR to produce a test spec by 5th March.

February 2017 - **At last test, valve closure time was below the specified time. The required time is > 90 seconds and < 120 seconds. Further monitoring required. Actual minimum closure time required >45 seconds. Functional specification requirement >90 seconds, with tolerance, to enable V14 to close prior to ESD-V1. Rotork will be maintaining the actuator in March and will be requested to adjust closure to the required time if possible.**

February 2017 - **Testing Contractor has issued pressure test report. Valve was in good condition.**

Rotork have been to site to service all the actuators and replaced the seals in the actuators. Annual Terminal Maintenance operations are now included in site operations.

ACTION 9 - The ball valve has not been serviced since installation. It is recommended that this valve be serviced. See Action 4. January 21015 - Action Closed see Action 4.

ACTION 10 - Process Conditions Testing under pipeline running conditions has not been carried out although activation on tank 3 was during pipeline operations and the valve closed. No valve closure times were recorded. Terminal will discuss this with the HSE at their next visit. Action - Delyth Williams to consider testing implications. January 2015 – Action Closed.



ACTION 11 – June 2014 Action Complete

ACTION 12 - June 2014 Action Complete

ACTION 13 - px to produce document control system. June 2014 Action Ongoing.

June 2014 - Two level switches have cracked heads. Picked up on DSEAR report. Specification of head materials to be investigated and changed if required. Now Replaced. January 2015, Action Closed.

A number of problems have been noted on the ROSOV butterfly valves on the tanks (non SIS systems). SPP are now responsible for inspection and testing of these valves. Results of testing and maintenance to be kept for reference. (Shut on ESD, fire alarm, high level alarms (hi Hi and Hi Hi Hi)).

Spurious alarm on tank 4 set off when tank 1 was tested. SCADA software issue? Testing to ensure the correct alarms indicate. January 2015 - No problems found during testing.

On switchroom, colours for indicators on SIS are not as per other alarm systems. No further action.

Bypass key is operated for testing. Testing of the shutdown is carried out once. No further action

There is an issue where the Nivotesters on the tanks could have a limited life. Information has been provided by Endress and Hauser regarding this. Testing documentation has been modified to include a wet test of each probe within a five year cycle. A number of housings have had to be replaced.

Gantry Testing

Not marked up as a Safety Instrumented System. ACTION 30 - Labelling to be carried out SIS (S.J.). February 2016 – Labelling Complete

Safety Relays have not been used for closing the final element. ACTION 31 – Omron Relays to be changed out for PILZ Safety Relays. (D.R.P.). February 2016 – Action Outstanding.

4.4 Training requirements and roles and responsibilities of employees and contractors.

Further training has been carried out in 2012 for operators, maintenance and terminal management.

The terminal still have to produce a procedure defining the roles and responsibilities of individuals at the terminal to ensure the maintenance and validation of the Safety Instrumented Systems.

ACTION 14 - Management team has been changed, further training to be carried out. Terminal to confirm. New Training Programme in place and ongoing. June 2014 - Action



considered complete. ACTION - February 2016 – Instrumented Safety Shutdown Systems to be highlighted in the training Programme and Plan. Now complete.

4.5 Review of organisation and resources.

px are now providing EC&I support for the operation of the terminal and the compliance and maintenance of the Safety Instrumented Systems.

P&I Design are providing Functional Safety Management support and assistance in the compliance, testing and maintenance of the Safety Instrumented Systems.

A local maintenance team is responsible for the procedures to ensure the maintenance of the Safety Instrumented Systems.

There is dedicated contractor support for local electrical and instrumentation issues, including the Safety Instrumented Systems. There is no back-up for this cover and electrical drawings may not be up to date. Knowledge base and cover to be considered. NEW ACTION S.M. January 2015 – January 2015 - Methods of addressing this weakness have been considered and none are seen as particularly viable. Documentation to be confirmed as complete and up to date. February 2016, extra support has now been identified and documentation to be upgraded. IS Calculations need to be provided as per DSEAR loop sheets required as part of documentation upgrade. IS calculations and loop sheets now completed. Contractors are now being introduced to site operations and maintenance to gain site knowledge.



4.6 Outcome of Functional Safety Assessments and Outstanding Action status.

A meeting was held at px offices on the 23rd April 2013 and the following actions have been updated/completed.

3.0

Electronic copies of all the Safety Instrumented systems is now held on the px 'S' drive

Proof Test procedures have been updated and are now site specific. Tests are to be completed and documented in October.

Q4 system is now fully implemented at the terminal.

4 FSA actions Complete.

Action 38, FSA 4 for SIS on Storage Tanks and Road Tanker Safety Instrumented Systems to be closed out.

4.0

Action 1 is not yet complete - Confirm SIL requirement from LOPA. June 2104 - NOW COMPLETE

Action 2 is now complete

Action 3, to be reviewed following LOPA carried out 10th October 2012.

Action 4, addressed at this and subsequent meetings. June 2104 - NOW COMPLETE

5.0

Actions still to be completed. February 2016 - ACTION OUTSTANDING P&I Design Ltd. to follow up urgently. June 2016 Action Complete, Design documentation reviewed and accepted.

6.0

Actions still to be completed. LOPA review carried out 10th October 2012.

Functional Safety Assessments have been carried out on the terminal for both the Storage Tanks Safety Instrumented System and the Road Tanker Gantries Safety Instrumented System. The following details the current status.

An FSA4 is now due and all documentation will be reviewed at the FSA. ACTION - FSA to be scheduled. Provisional date 20th June 13:00. Quote for FSA to be issued.

FSA1 & FSA2 for the VRU SIS have been carried out and an FSA3 will be carried out once the SAT has been completed.



Storage Tanks Safety Instrumented System

Action No.	Action	By	Expected Completion	Completion Date
1	Confirm SIL requirement from LOPA. LOPA review 10 th October 2012. Tank Overfill from COMAH 3.55×10^{-5} . ACTION COMPLETE, SIL 1 SIS required and installed.	px	End June 2012	June 2014
2	SIS design to include reference to the manual override and confirm action of override and shutdown	P & I Design Ltd.	End June 2012	SRS Updated 29/05/12
3	SIL Calculation to be redone, sensor referenced as Magnetrol, this is incorrect.	P & I Design Ltd.	End June 2012	PFD Calc Updated 29/05/12
4	The VRU return rate needs to be confirmed and the ullage above the SIS high high high level is to be confirmed. Then the time available before overfill can be calculated. June 2014 – ACTION COMPLETE, ~2 hrs 30 minutes to overfill at VRU rate and VRU pumps shut down on high high alarms.	px / P & I Design Ltd.	End June 2012	June 2014
5	There is no protection from the SIS on tank to tank transfers or VRU return. A modification of the SIS is to be considered. June 2014 – ACTION COMPLETE (email from Matt Dearnley, dated 4/8/12, stating that there is protection provided through the ROSOVs, and pump shutdowns, that are linked to the independent alarms.)	px / P & I Design Ltd.	End June 2012	June 2014
6	The duties of the tanks are not as per detailed in the SRS. Changes in SRS to be documented.	P & I Design Ltd.	End June 2012	SRS Updated 14/06/12



7	Follow up to obtain report from Rotork on problem with SIS valve ESD-V1. <i>(There has been a problem on ESD V1 rotork valve where it was not confirmed as fully open at the proximity sensors when the valve was fully open and fully closed This has been investigated by Rotork. A report has been promised by Rotork.)</i>	px	End June 2012	Report issued, no fault found.
8	Ensure documentation completed and ensure Bramhall terminal management sign off documentation. Reviewed 2014, to be issued to D. Williams for sign off	px / P & I Design Ltd.	End September 2015	Action Closed, documentation to be issued on cloud based system
9	Ensure Bramhall terminal have record of SIS actions, tests etc.	px / P & I Design Ltd.	End June 2012	Issued June 2012
10	To produce basis of documentation to px as part of the Safety Committee.	P & I Design Ltd.	End June 2012	23/04/12
11	PFD Documentation on valve body to be obtained if possible. Manufacturer cannot confirm data. DSR to confirm better PFD data. Now included in PFD Calculation	P & I Design Ltd.	End September 2014	September 2014
12	Validation Dates to be brought forward to November. Now due in 23 rd October 2012	px / P & I Design Ltd.	End June 2012	Complete October 2012
13	Update SIS documentation as required. LOPA review 10 th October 2012	P & I Design Ltd.	End June 2012	SRS & SIS Updated 14/06/12
14	Safety Committee to agree Management of Functional Safety.	px / P & I Design Ltd.	End June 2012	23/04/12 & 2 nd October 2012



Road Tanker Gantries Safety Instrumented System.

Action No.	Action	By	Expected Completion	Completion Date
1	Liquid Level/quantity in vapour line at activation point to be confirmed. June 2014 - Confirmed as 30 litres. ACTION COMPLETE	BC&T	March 2012	June 2014
2	Operating Procedure for loss of Safety System BRM-POL-010 (This may be revised to a px document) is to be issued. June 2014, ACTION COMPLETE, new procedure BRM-OP-014 issued. Copy to be issued to P&I Design Ltd. for reference.	px	March 2012	June 2014
3	The system appears to be designed in accordance with the Safety Requirement Specification and the Design Basis Memorandum. DBF to confirm and document. June 2014, Documentation issued to P&I Design Ltd.	P&I Design Ltd.	September 2015	Completed. October 2015
4	The installed system will be independently inspected and tested by P&I Design. Due 23 rd October 2012	P&I Design Ltd.	March 2012	Completed. October 2012
5	Design documentation is to be reviewed independently by D. R. Ransome. June 2014, Documentation issued to P&I Design Ltd.	P&I Design Ltd.	September 2015	Complete June 2016
6	BC&T to send the completed testing documentation for inclusion in this FSA. Testing implemented as a procedure in Q4	BC&T	March 2012	16/12/11 (Appendix3)
7	Compliance document to be completed. June 2014, Documentation issued to P&I Design Ltd.	P&I Design Ltd.	September 2015	Complete
8	Further specific appreciation training on Safety Instrument Systems will be completed and documented.	P&I Design Ltd. / px	End 2012	Complete



9	Gantry LOPA to be reviewed following re-write of COMAH report. LOPA now supplied to P&I Design Ltd. Review ongoing to be completed by end September 2014.	P&I Design Ltd.	September 2015	June 2016 Complete. LOPA is up to date and conclusions are acceptable.
10	Road Loading SIS Documentation to be reviewed following LOPA review. June 2014, Documentation issued to P&I Design Ltd.	P&I Design Ltd.	September 2015	Complete June 2016



4.7 Review of any management of change or modifications to the systems.

It was noted that modifications for functional safety have been carried out since the previous meeting.

Manifold Pit LEL Detection and alarm has been installed and is being maintained and tested in accordance with procedures.

There may be a requirement for an additional Safety Instrumented System on the VRU. Action 33 – to be reviewed. SRS, SIL verification and Safety Plan produced for VRU SIS. MOC156. Snag list issued for actions prior to SAT. Site visit by P&I Design Ltd. expected next week following confirmation of pipeline schedule.

Omron relay changes in tank overfill SIS completed. MOC 152

Omron relay changes for gantry SIS to be completed. MOC required.

V1 position indicator - MOC 144

V1 ball valve changed for like for like replacement. Picked up in testing documentation (Equipment Hardware)

Login details for new Information Management system to be shared. Action 35 – now completed.

4.8 Review of any HSE or other agency visits.

Environment Agency and HSE have visited the site in June 2014.

Actions, recommendations and comments from these meetings will be circulated to the Functional Safety Committee. ACTION S.M. January 2015 - Inspection reports reviewed briefly at the meeting. Actions captured by terminal action tracker. February 2016 – No CA inspection carried out in the last 12 months.

No actions, from CA, concerning functional safety were required in 2016.

Review of any changes in the standard or competent authority guidelines – See draft CDOIF Guidance on Installed SIS. Comments to be transmitted to Sam Millward by end of February.

4.9 Competency

Competency was discussed at the meeting, px have their own competency matrix and have been undergoing training on Functional Safety to improve and demonstrate competency.

Formalised system to ensure competence of contractors is ongoing.

Action 39 - P&I Design competency to be issued to px.



4.10 Critical Items Issues

Spares for critical equipment have been considered and it is considered as not economically viable to keep a spare actuator and valve. The reliability of the system has been calculated and spurious trips have been considered. Operability, after a failure, would be considered on a case by case basis with full risk assessments.

4.11 Review Management of Functional Safety Documentation

ACTION 32 – Review Management of Functional Safety Documentation and upgrade as per current standards.

February 2017 – Functional Safety Management Documentation to be reviewed. On Hold, pending future arrangements under CLH control.

4.12 Review of independent Instrumented Safety Functions.

Sump Detectors for hydrocarbon liquid detection are installed and are being maintained and tested in accordance with procedures.

ESD Testing is carried out on a weekly basis.

BPCS and SCADA systems are now formally tested in the improved testing procedures. Tank Gauging systems are maintained and tested by Motherwell Tank Gauging. Reports are available on the site maintenance systems (Q4).

COMPLEX Detailed inspections on SIS systems are carried out during SIS proof testing to confirm “As Found” and “As Left” testing is carried out.

Compressors systems are being improved to maintain air supplies to instrumented functions. (double valve isolations and local, lockable electrical isolation switches for each compressor have been added to allow maintenance without interruption of supply. Compressor duties are monitored and maintained to ensure even use of motors.

Tank High High level shutdown system is an independent system which shuts down the OPA valve (V14). This is tested 6 monthly simultaneously with the Safety Instrumented System.

When a tank is taken out of service for maintenance, an “As Found” proof test is carried out and an “As left test carried when the tank is re-commissioned.

Liquid LEL testing in the tunnels, bunds, VRU, interceptor pit and go-devil pit are carried out every 6 months in conjunction with testing of the Sump Detectors for hydrocarbon liquid detection.

Rotork valves are tested and maintained annually.

ROSOV valves in the tank tunnels are tested visually (for open/closed) monthly. ROSOV are routinely removed for maintenance and repair when a tank is removed from service for maintenance.



ROSOV valve in the loading gantries are tested visually (for open/closed) monthly. Valve stem alignments are included in the visual checks.

Rack 6 is not currently annunciated individually on annunciator in control room. It does annunciate on SCADA and radio. Requirement to be confirmed. 14.02.17 - Confirmed as operational on annunciator.

Reports of all tests are maintained in the site maintenance system (Q4).

5 NEXT MEETING

6 monthly meetings were discussed and extending the interval to annually was considered acceptable.

Next review arranged for 20th February 2018.

