



2nd ISA UAE Automation Conference and Exhibition 2017

www.isa-uae-expo.org

St.Regis, Abu Dhabi - UAE

16th - 17th May 2017



Challenges in EPC Projects for Online Analyzers

EXPERIENCE THE FUTURE.

Zaheer Juddy - AIMS

Organised By:





DISCLAIMER

The Intention of this Presentation is not to offend or harm any of EPC, FEED, OEM Vendors.

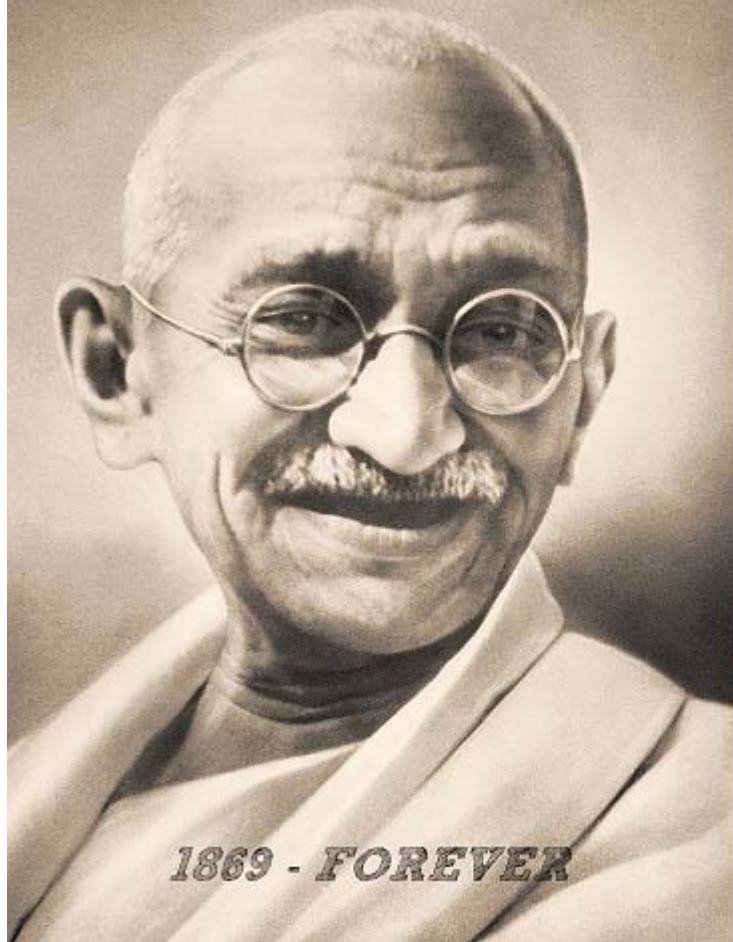
It is purely intended to SERVE the Customer better



A Customer is



MAHATMA GANDHI



1869 - FOREVER

THE GREATEST MARKETER OF ALL TIME

**"A customer is the most important
visitor on our premises.**

**He is not dependent on us. We are
dependent on him. He is not an
interruption in our work. He is the
purpose of it. He is not an outsider in our
business. He is part of it. We are not
doing him a favour by serving him. He is
doing us a favour by giving us an
opportunity to do so."**



Introduction



- **Multidiscipline / Diverse Teams**
 - FEED / EPC (Documentation)
 - The analyzer vendor (OEM)
 - The Systems Integrator (“SI”)
 - The Project Management Team (PMT) / End-User
- **Common Issues (Consequences..)**
 - FAT/SAT fails, often
 - Not fit for Purpose Delivery
 - Rework , Change Order, Delay in project time lines
- **Solution**
 - Specification & Scope (detailed, specific & firmed)
 - Documentation & Drawings (Approved / no delays)
 - Execution, Supervised by competent Team
 - Completion / Closure involving PMT Team



7 DEADLY SINS of EPC PROJECT FOR ANALYZERS



- 1. Location & Plot plan Mistakes**
- 2. Tapping Point Identification**
- 3. Datasheets & Documentation**
- 4. Flawless Project Implementations**
- 5. VDRL – An Infinite Document List**
- 6. Approved Vendor List Challenges**
- 7. Site Commissioning and Training Issues**



1. Location & Plot plan Mistakes

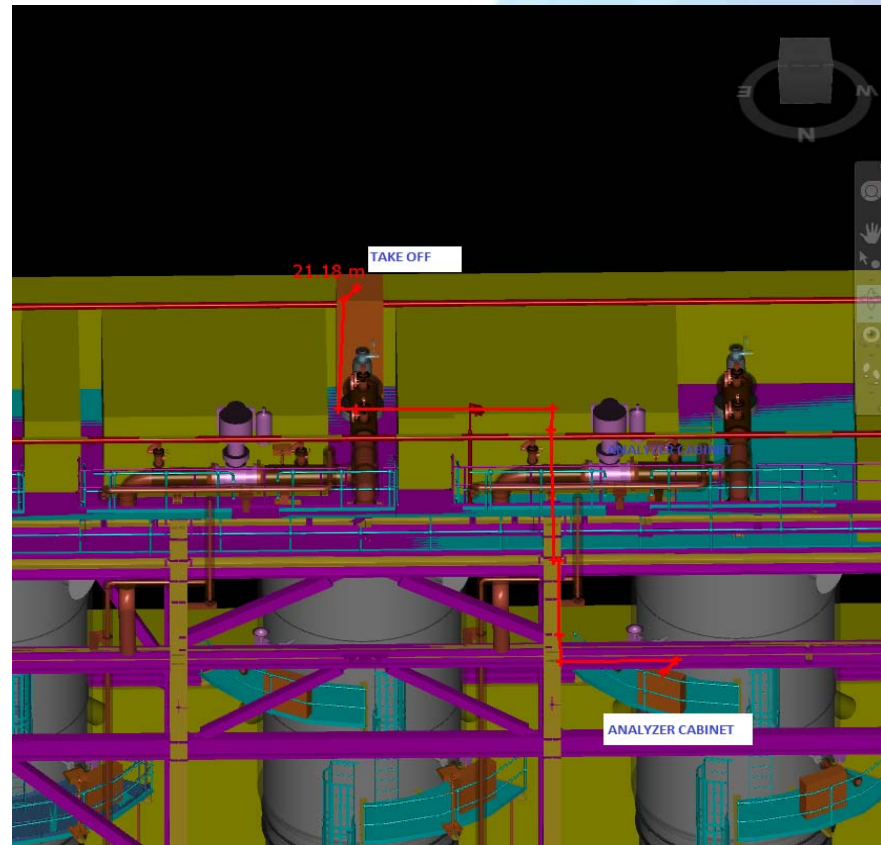
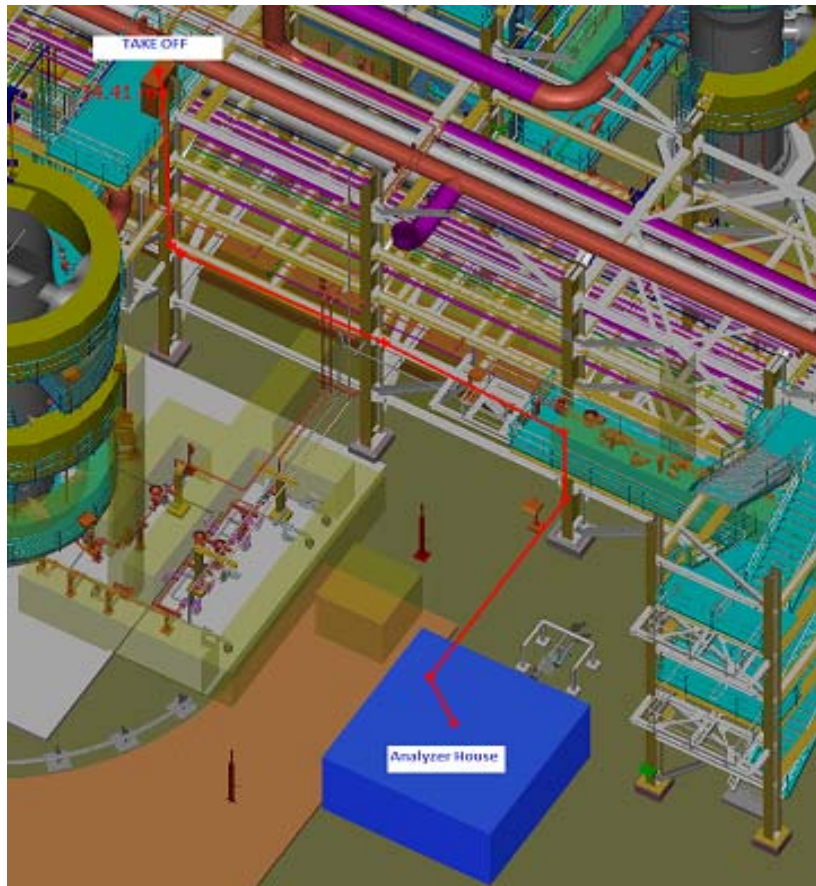




1. Remedy for Location & Plot plan Mistakes



During Engineering Phase upon 60 % of your 3D Model of Plot, Identify your Location, Grouping Wisely to eliminate plot plan mistakes

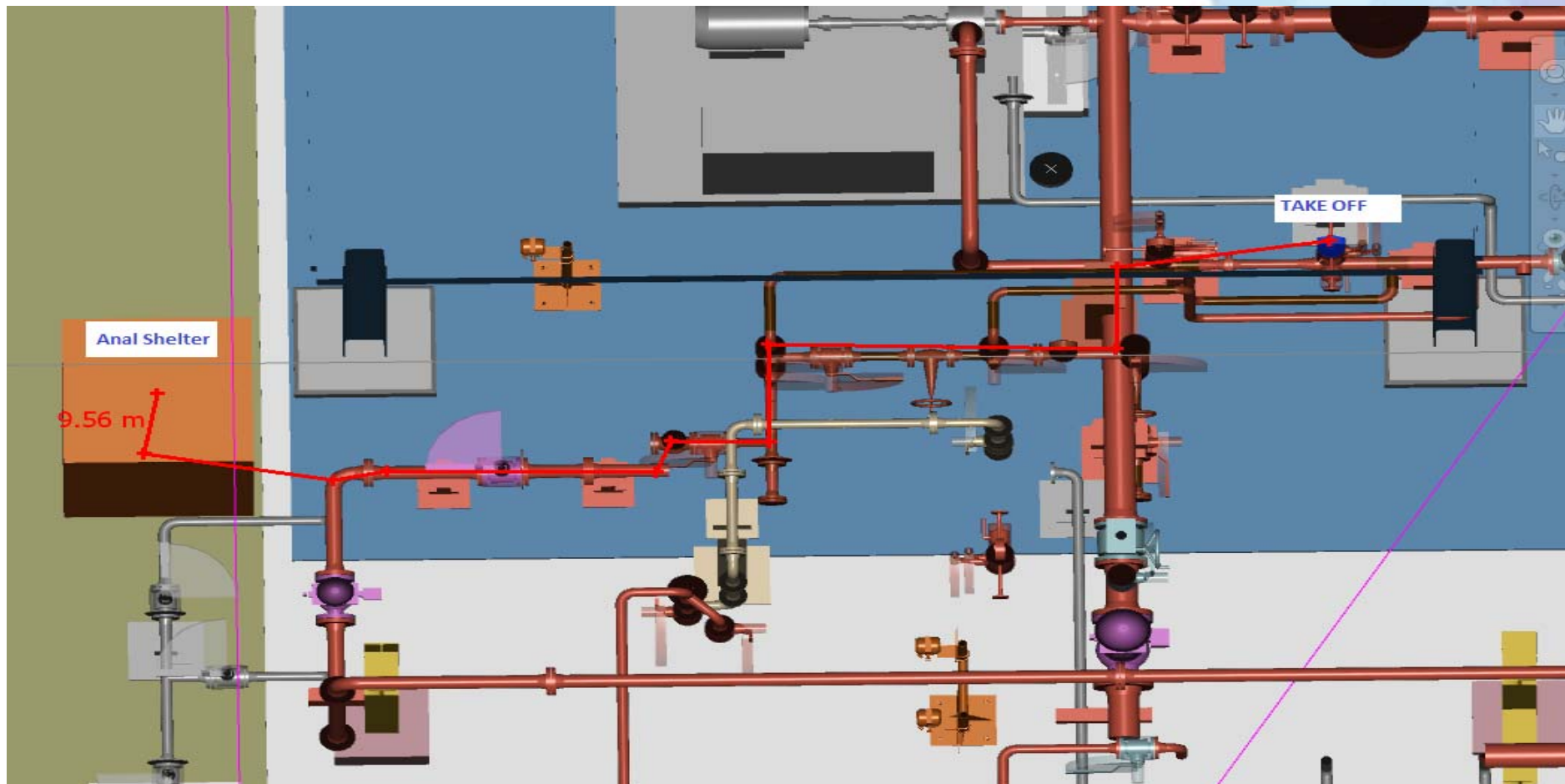




1. Remedy for Location & Plot plan Mistakes



Routing needs to be defined so that the analyzer shelter is as near as possible from Take-Off





2. Tapping Point Identification & Implementation of PEFS



How Do I Reach



Impossible to reach tapping point
(Obstacles)





2. Remedy Tapping Point Identification



- Tapping Point has to be defined as per the Process Conditions based on process phase, Velocity etc.

- Sample Take-Off:

In case of liquid samples where there is a possibility of vapor on the top of a horizontal line and dirt or solids on the bottom of the line.

For sampling vapors, the connection may be located in the side or top of the process line, but in both cases with due consideration to accessibility for maintenance



3. DATA SHEETS & DOCUMENTATION MISTAKES



1. Analyzer datasheets are **OUTDATED**
2. No Adequate Information Available
3. Process Design Specifications are not clear
4. Utilities data is always missed
5. Process Composition Information is always a **BIG CHALLENGE**

Let Me share an Interesting Recent Application.....



Stream Composition as per Datasheet



48	Stream Composition / Property	Component Tag Number	Minimum	Normal	Maximum	Measurement Range	Units
49	C3	-		0.6		0 to 10	mol %
50	iC4	-		34.4		0 to 50	mol %
51	nC4	-		63.2		0 to 75	mol %
52	iC5	-		1.7		(iC5+nC5) 0 to 5	mol %
53	nC5	-		0.1		-	mol %
54							
55							
56							
57							
58							
59							
60							

LAB Analysis Performed for the same stream

0.620	2	-	-	-	Hydrogen
0.690	1 VV +	56.44493	6.75733e-3	0.373694	C6+
1.253	1	-	-	-	1 METHANE
1.343	1	-	-	-	2 ETHANE
1.430	1	-	-	-	2 ETHYLENE
1.672	3	-	-	-	CO2
1.716	1	-	-	-	3 PROPANE
2.330	1	-	-	-	3 PROPYLENE
2.806	1 BB	713.96533	1.95010e-2	13.641126	4 ISO-BUTANE
2.946	1 BB S	1504.31311	1.93750e-2	28.555988	4 N-BUTANE
3.673	1	-	-	-	4 TRANS-2-BUTENE
3.885	1	-	-	-	4 ISO-BUTYLENE
4.207	1 VB S	2059.72021	1.55849e-2	31.450579	5 ISO-PENTANE
4.332	1 BB	1496.01587	1.74900e-2	25.635578	5 N-PENTANE
4.348	3	-	-	-	H2S
4.416	1	-	-	-	4 1,3 Butadiene
5.521	3	-	-	-	O2/Ar
5.915	3 VB	89.58659	3.90821e-3	0.343035	N2



3. Remedies for Datasheet & Documentation



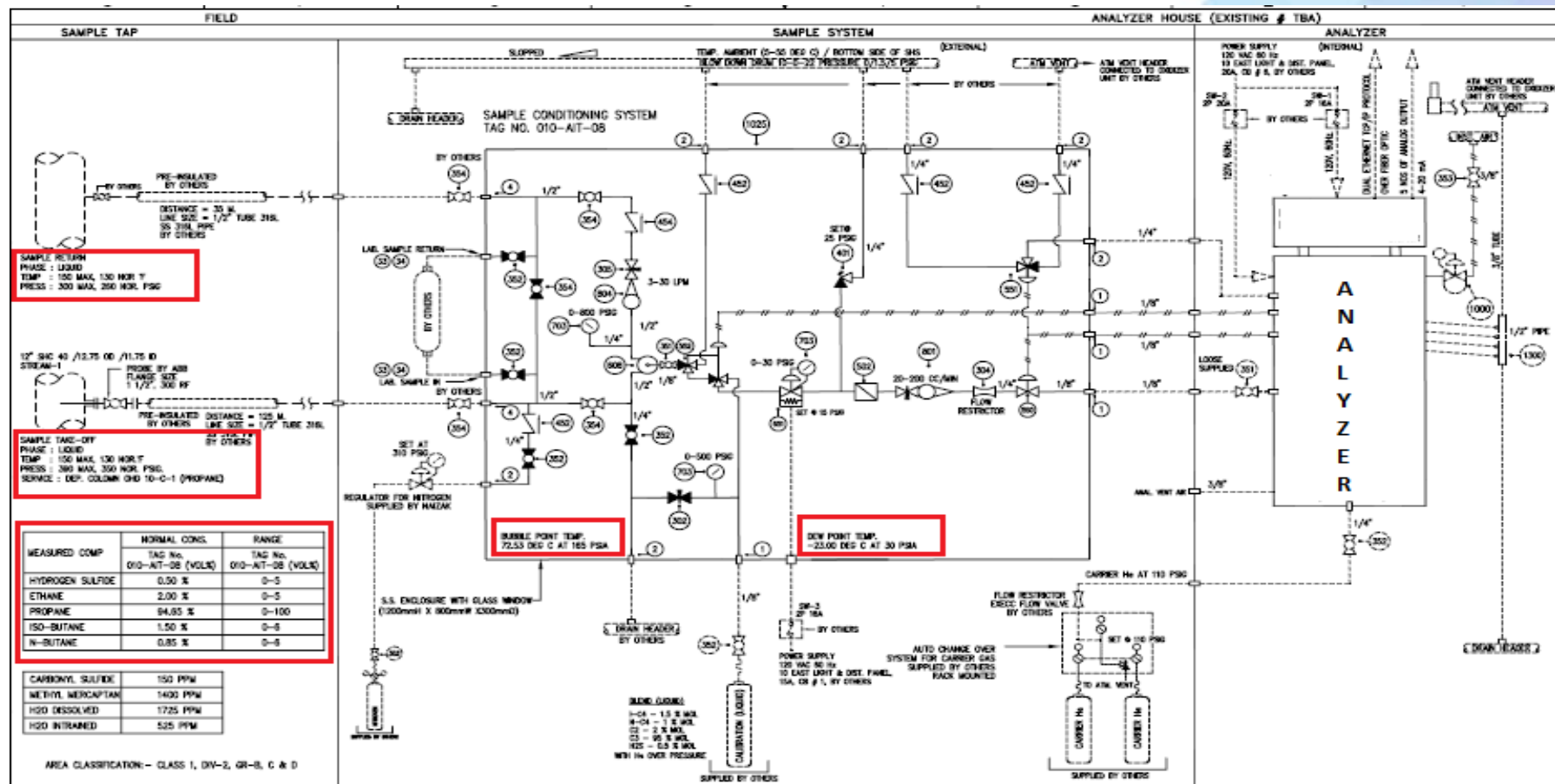
- Datasheets need to be updated on Regular basis
- Process Composition to be updated with Process Variations for MIN NOR & MAX
- A Standard ISO Datasheet format to be followed to enhance the Vendor to Serve the best
- All PEFS documents to be corrected with 3D Modelling and other advanced software at EPC level
- PEFS should also include DEW & Bubble Point Calculations



2. Remedy Datasheet & Documentation: Implementation of PEFS with all the Data



- Include all the related data in the PEFS for ease of Identification





4. Flawless Project Implementations



- Learn from Flaws
Committed Every time
- Implement Flawless Project
Delivery as Sub Project in
Every Project to be
Implemented





Lets Discuss Lessons Learnt and Flaws Corrected.....



Where I am.... when sampling



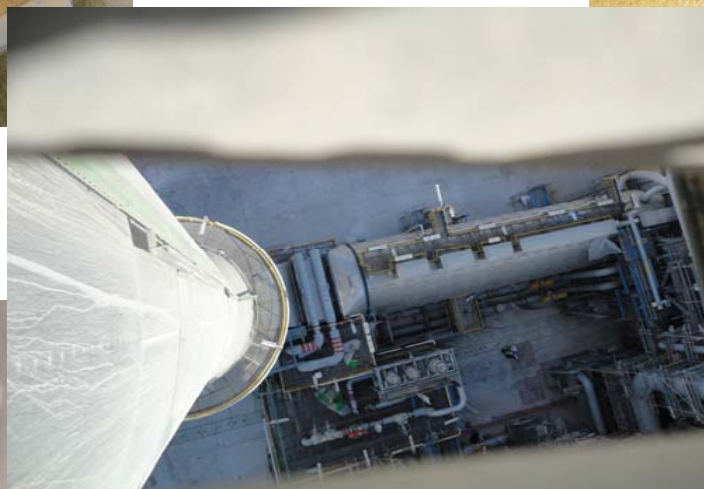


PROBE MAINTENANCE MISTAKES



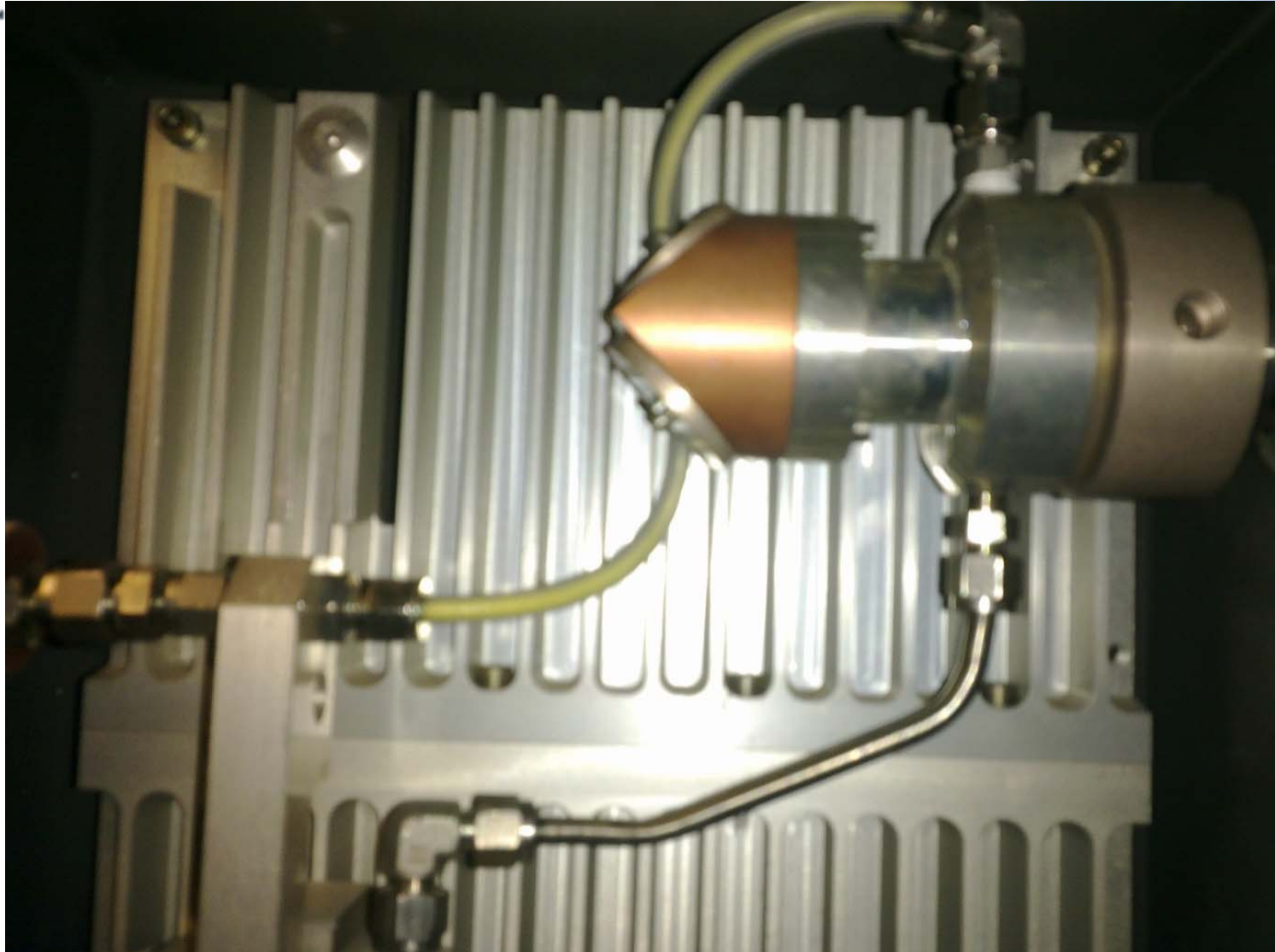


PROBE MAINTENANCE MISTAKES





What can happen





SHS DESIGN

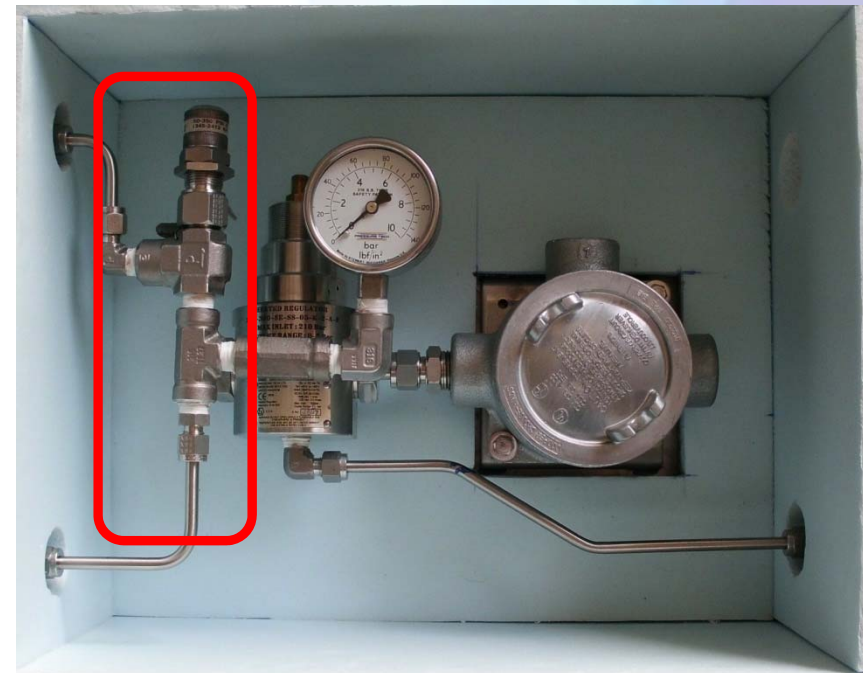


Safety to analyzer system

Wrong - During regulator failure outlet pressure increases to inlet pressure which damage the analyzer sensor



Correct - Pressure relief valve installed downstream of the pressure regulator





Sample Return to Process/Flare or Drain



**Use of Sample Return
Tank to return
sample to high
pressure return**

**Return to Flare –
Back pressure sustainability
of Analyzer**





5. VDRL – An Infinity Document List



VDRL –Infinite Document List Containing Finite Number of Key & Useful Documents for Analyzers

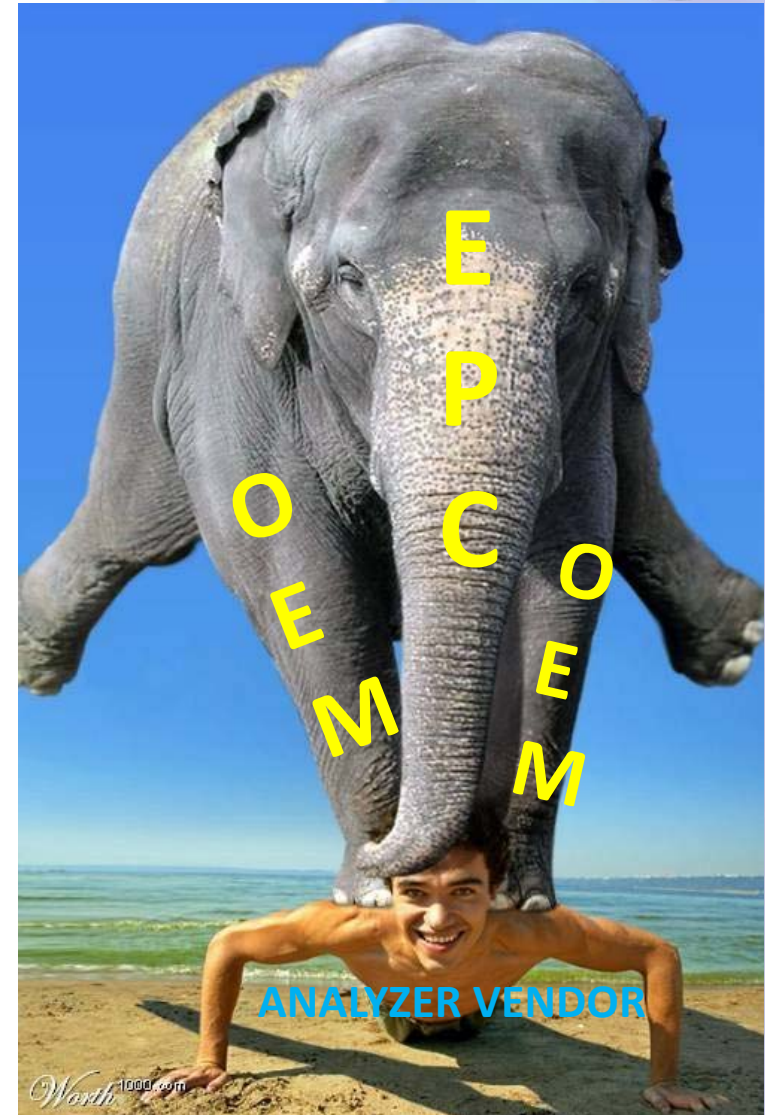
11	C311321	SHJ	IN	PROCESS/UTILITY ENGINEERING FLOW SCHEMES (PEFS/UEFS)	06	REVIEW		06-11-2016	A
12	C311321	SHJ	IN	CONTROL PHILOSOPHY & BLOCK DIAGRAMS	01	REVIEW	15-12-2016		B
13	C311321	SHJ	IN	ELECTRICAL SCHEMATIC DIAGRAM	02	REVIEW	05-12-2016		B
14	C311321	SHJ	IN	AMADAS INTERFACE DRAWING INPUT / OUTPUT	01	REVIEW	08-12-2016		B
16	C311321	SHJ	IN	EQUIPMENT DATA SHEETS	01	REVIEW	18-09-2016	23-11-2016	
17	C311321	SHJ	IN	INSTRUMENT DATA SHEETS	02	REVIEW		26-11-2016	B
20	C311321	SHJ	IN	ANALYSER ELECTRICAL LOAD SCHEDULE	06	REVIEW		08-11-2016	A
28	C311321	SHJ	IN	PNEUMATIC TEST PROCEDURE	02	INFO		22-09-2016	B
30	C311321	SHJ	IN	PRESSURE TEST CERTIFICATES	01	INFO	10-12-2016		
31	C311321	SHJ	IN	QUALITY MANUAL	01	INFO		02-04-2016	A
32	C311321	SHJ	IN	PROJECT QUALITY PLAN	01	REVIEW	08-08-2016	08-11-2016	
33	C311321	SHJ	IN	QUALITY CONTROL PLAN (INSPECTION AND TEST PLAN)	02	REVIEW		04-08-2016	A
34	C311321	SHJ	IN	QUALITY MANAGEMENT ACCREDITATION (ISO HSE)	01	INFO		04-08-2016	A
35	C311321	SHJ	IN	AUDIT SCHEDULE	01	INFO	TBA		
36	C311321	SHJ	IN	AUDIT REPORTS	01	INFO	TBA		
37	C311321	SHJ	IN	CORRECTIVE ACTION REORT	01	IF APPLICABLE	TBA		
38	C311321	SHJ	IN	INSTALLATION ,COMMISSIONING OPERATING & MAINTENANCE MANUALS LIST	01	REVIEW		10-11-2016	B
39	C311321	SHJ	IN	INSTALLATION ,COMMISSIONING OPERATING & MAINTENANCE MANUALS	01	INFO	10-12-2016		
40	C311321	SHJ	IN	SPARE PARTS & INTERCHANGEABILITY RECORDS (SPIR) SCHEDULE	01	INFO	08-12-2016		
41	C311321	SHJ	IN	TRAINING DATA	01	INFO	TBA		
42.15	C311321	SHJ	IN	FUNCTIONAL PERFORMANCE TEST PROCEDURE	01	REVIEW		Refer OEM FAT	
43.1	C311321	SHJ	IN	OEM FAT PROCEDURE FOR WATER CUT ANALYSER	01	REVIEW	08-08-2016	23-11-2016	
43.2	C311321	SHJ	IN	OEM FAT PROCEDURE FOR TVP ANALYSER	01	REVIEW		29-10-2016	A
43.3	C311321	SHJ	IN	OEM FAT PROCEDURE FOR H2S (GAS) AND TOTAL SULPHUR ANALYSER	01	REVIEW	17-08-2016	23-11-2016	B
43.4	C311321	SHJ	IN	OEM FAT PROCEDURE FOR H2S (LIQUID) ANALYSER	01	REVIEW		29-10-2016	A
43.5	C311321	SHJ	IN	OEM FAT PROCEDURE FOR TOTAL SULPHUR GC, CRICONDENTHERM	01	REVIEW	17-08-2016		B
43.6	C311321	SHJ	IN	OEM FAT TEST PROCEDURE FOR TOC ANALYSER & CO2 ANALYSER	01	REVIEW	17-08-2016		B
43.7	C311321	SHJ	IN	OEM FAT TEST PROCEDURE FOR MOISTURE ANALYSER	01	REVIEW		29-10-2016	A
44.1	C311321	SHJ	IN	SITE ACCEPTANCE TEST PROCEDURE	02	REVIEW		03-11-2016	A
45	C311321	SHJ	IN	LIFTNG PROCEDURE	01	INFO	15-12-2016		
46	C311321	SHJ	IN	PRE-COMMISSIONING/COMMISSIONING PROCEDURES	01	REVIEW	30-10-2016	10-11-2016	
47	C311321	SHJ	IN	PREPARATIONS FOR SHIPPING WITH RECOMMENDED HANDLING, STORAGE & PRESERVATION PROCEDURE	01	REVIEW	30-10-2016	23-11-2016	



CONSEQUENCES

Long Punch List as per Long Wish List ..

Load Everything on Analyzer Vendors and Integrators





Remedies for VDRL



Make a Separate VDRL for Analyzers and Make all the documents available to the END USER

Ensure all the information required by the Analyzer Vendor to be submitted by the EPC Contractor



6. Approved Vendor List Challenges



Does Analyzers Need to have a Separate AVL...

YES !!!

AVL Lists needs regular Updates with Advance Technologies Trending in the market - TFS & TDLAS



7. Site Commissioning and Training Issues



- **Site Acceptance Test Always FAILURE**
- **END User cannot understand the Technology**
- **Training is often not considered**

REMEDIES:

- **Involve END User from the Engineering Stage**
- **Train USER at regular intervals of the project**
- **FAT/SAT Procedure to be approved by USER as well**



Conclusions & Recommendations



- The credits delivered by analyzers far outweigh the costs
- Minimum cost leads to poor availability, high cost of ownership
- Retain career analyzer professionals at FEED & EPC level
- Let an analyzer engineer sign off on the piping design
- Move analyzers closer to the pipe.
 - If a closed shelter is required, use cabinets when possible
 - Utilize analyzers houses when necessary.



Thank You