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# **THE IMPORTANCE TO CORRECTLY ASSESS THE FLAMMABLE HAZARDS AND ITS EXTENT DURING DESIGN AND PRIOR TO OPERATION**

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**Kuala Lumpur City Centre**

**Jalan Ampang**

**50088 Kuala Lumpur**



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# Objectives



# Objectives

To share:

- **Past experiences of inaccuracy of Hazardous Area Classification (HAC) and misinterpretation, impacts and resolutions/recommendations.**
- **The need to control and re-evaluate changes to existing plant and infrastructure.**





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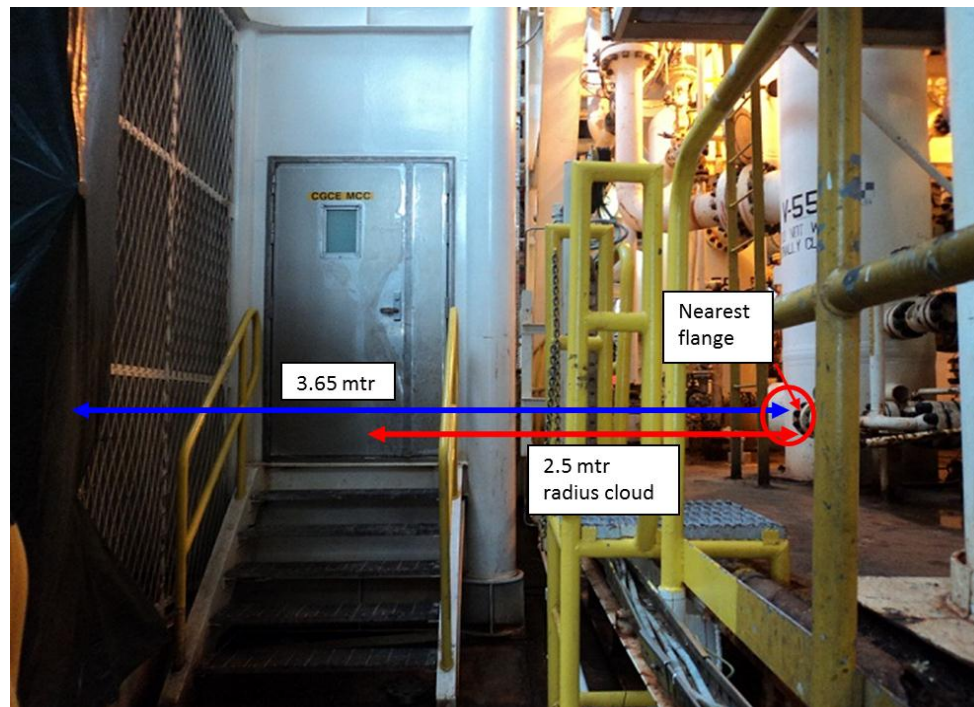
# Observation



# Observation

The following are samples of observation that practically common to other installation:

- HAC is not being updated to reflect the impact of the new installation of Fuel Gas Heater by Operation group.
- The latest fuel source that impact HAC is not communicated to Project Team resulting in improper design solution.





# Observation

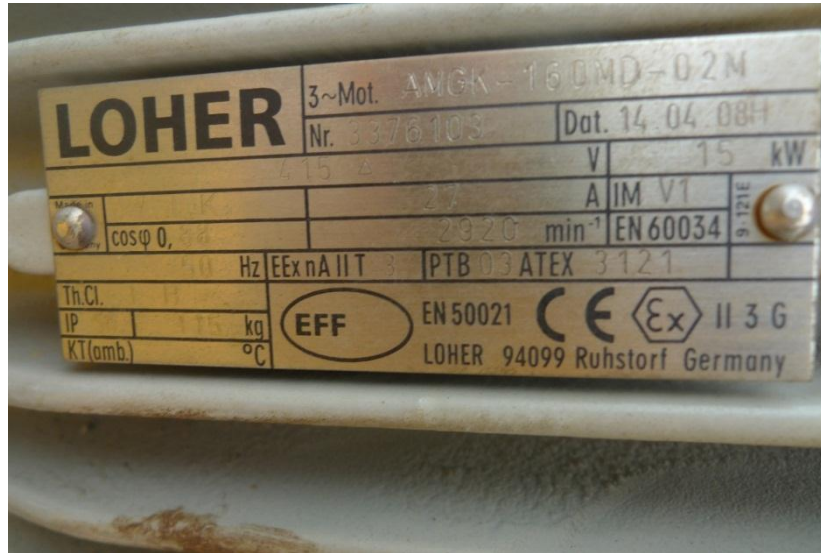
- Inaccurately in performing HAC e.g. Overdesigning battery room containing recombination type of battery.
- The room was designed based on worst case scenario i.e. Vented Lead Acid, resulting in unoptimise solution.





# Observation

- Misinterpretation of HAC during equipment selection.
- HAC drawing was only interpreted from top view only, resulting in Ex nA motor being selected instead of Ex de motor.





# Observation

- Misinformation within area classification schedule.(radius and temperature class)
- AIT is not accurate
- Temperature class shall be decided based on individual equipment surface temperature.
- Extend of radius shall be based on the right reference clause.

## Notes:

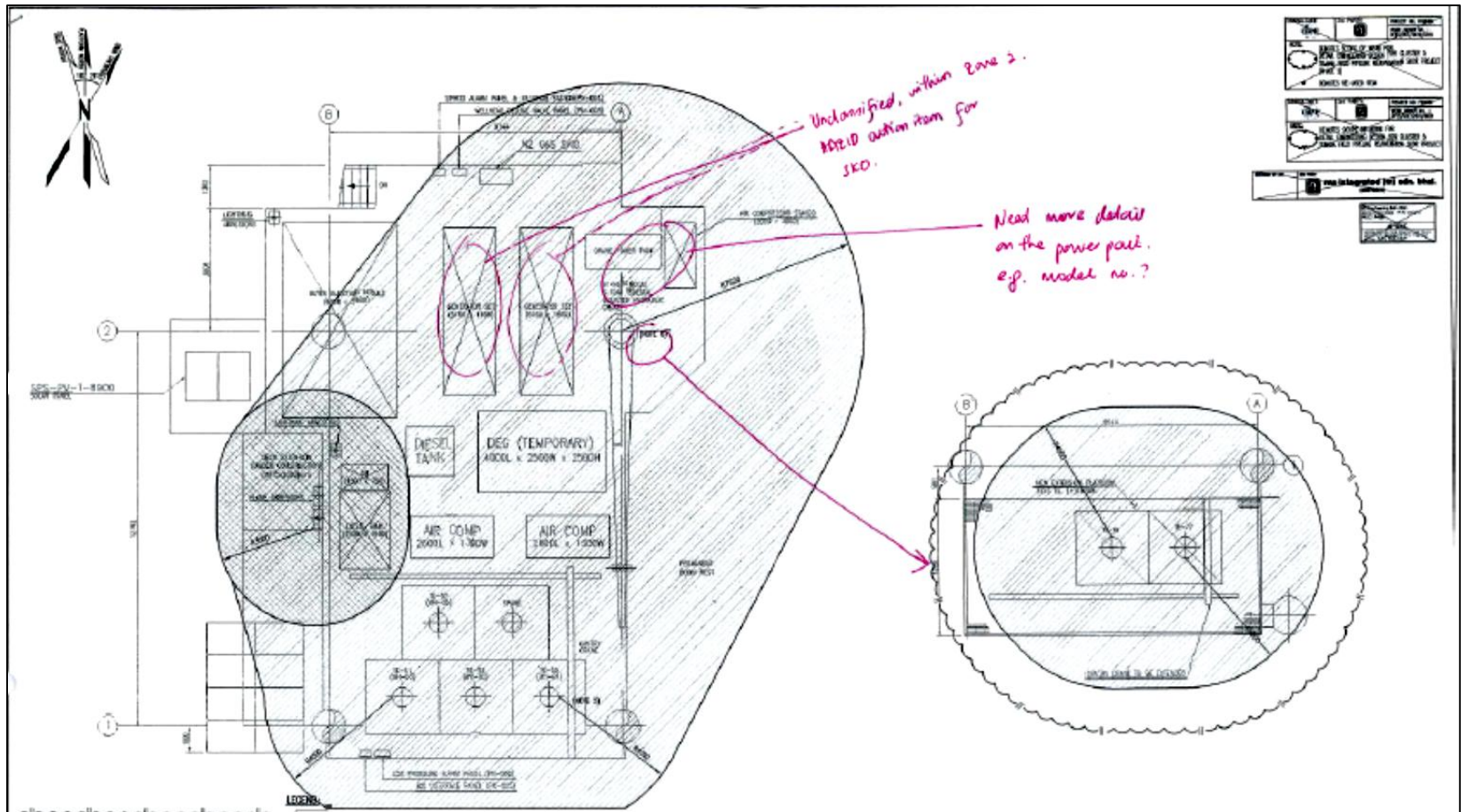
1. Fluid Category defined based on Average Molecular Weight of HC within equipment. Guidance taken from Annex A and Annex C of IP15.
2. The Release Frequency Level for the whole plant is Level 1 with Secondary Grade of Release.

No.	Tag Number	Item Description	PFS/UFS No	Pressure, bar a	Gas Phase	Liquid Phase	AIT	Source of release	Level/Type of Ventilation	Gas Group ; Temp. Class	IP 15 Reference for R1	Hazard Radius (R1)		Hazard Radius (R2) at grade level (Table 5.8)	Remarks
					Fluid Category (Note 1)	Fluid Category	AIT	Source				Zone 1	Zone 2		
1	01R-1101	Central Livanov Gas Pig Receiver	001	91.5	G (i)	C	>200	Pig doors	Natural / Outdoor	IIA; T3		3	7.5	-	Area classification zone 2 of 7.5 m around valves & flanges
2	01R-1102	Gas Pig Receiver (Future)		95	G (i)	C	>200	Pig doors	Natural / Outdoor	IIA; T3		3	7.5	-	Area classification zone 2 of 7.5 m around valves & flanges
3	01R-1302	Condensate Pig Receiver (Future)					>200	Pig doors	Natural / Outdoor	IIA; T3		3	7.5	-	Area classification zone 2 of 7.5 m around valves & flanges
4	01R-1301	Central Livanov Condensate Pig Receiver	001	93	G (i)	C	>200	Pig doors	Natural / Outdoor	IIA; T3		3	7.5	-	Area classification zone 2 of 7.5 m around valves & flanges
5	01L-1101	Gas Pig Launcher	001	91.25	G (i)	C	>200	Pig doors	Natural / Outdoor	IIA; T3		3	7.5	-	Area classification zone 2 of 7.5 m around valves & flanges



# Observation

- No firewall is being constructed to demarcate hazardous area contributed by wellhead.
- Non-hazardous area is not available to locate temporary diesel generator, welding set and etc.





# Observation

- Wrong reference to perform HAC involving cryogenic facility. i.e. IP Part 15 was used as reference. Clause 1.0 of Chapter 1 state the exclusion of cryogenic facility for the applicability of the standard.
- HAC involving dust environment is not being assessed or performed. i.e. HAC was only done for gas sources.
- Non-optimizing design. e.g. cabin door within hazardous area.





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# Root Cause



# Root Cause

- Substantial competency gap in HAC and Ex related matters contributed by lack of field experienced.
- Insufficient communications between various group and require interdisciplinary design document review.
- HAC management guideline is not fully adhered.
- Management of Change (MOC) is not fully executed.





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# Implication



# Implication

- Cost to install new Ex equipment if over design.
- Cost to replace for non-compliance equipment if inaccurate design.
- Production deferment for non-compliance equipment.
- Operational impact e.g. challenges to locate non Ex equipment supply by contractors.  
e.g. temporary generator, welding set





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# Resolution



# Resolution

Execute and fully comply to Ex management system which include:

- Ex training and certification scheme.
- Management of Change(MOC).
- Ex situational assessment.
- Ex documentation.
- Interdisciplinary communication and review.
- Appointment and Authorization Ex person.



## PETRONAS Ex Authorised Competent Person



**Certificate of Authorisation**  
This Certificate of Authorisation is issued to :

Name :  
Designation :  
Staff ID :

Who is hereby appointed as an  
**Ex Authorised Competent Person**  
For [ discipline & party ]  
In accordance with the Ex Certification and Marking Guideline (Ex CMG)  
PTS No:.....

Endorsed by :  
Approved by :

\_\_\_\_\_  
.....(Name).....  
Technical Authority  
.....(OPU).....

\_\_\_\_\_  
.....(Name).....  
.....(Position).....  
.....(OPU).....

- ✓ Name
- ✓ Designation
- ✓ Staff ID
- ✓ Party & Discipline
- ✓ Reference PTS
- ✓ Signatories

\*Appointment of Ex ACP and Ex AP are valid  
for 3 years from the date of appointment





**Certificate of Appointment**

This certificate of Authorisation is issued to :

Name :  
Designation :  
Staff ID :

Who is hereby appointed as an

**Ex Appointed Person**

For [ discipline & party ]

In accordance with the Ex Certification and Marking Guideline (Ex CMG)

PTS No:.....

Date Issued:  
Validity Period:

Endorsed by :

Approved by :

\_\_\_\_\_  
(Name)  
Technical Authority  
(OPU)

\_\_\_\_\_  
(Name)  
(Position)  
(OPU)



## PETRONAS Declaration of Conformity for Zone 2 Facilities

Insert company's logo

### DECLARATION OF CONFORMITY

The undersigned, representing the following manufacturer

Manufacturer:	
Address:	

Herewith declares that the product

Product identification:	
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To which this declaration refers are in conformity with the following

Standards or Normative Documents:	
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Subject to installation, maintenance and utilization in accordance with their purpose, regulations, current standards, manufacturer's instructions and industry standards, is in conformity with the provisions of the following EC directive(s) (including all applicable amendments):

Reference No.	Title

The CE marking on the product and/or the packaging signifies that Square D holds the reference technical file available to the European Authorities.

Name: \_\_\_\_\_ Date: \_\_\_\_\_ Authorization Signature

Position: \_\_\_\_\_

Signature: \_\_\_\_\_

- ✓ Reference No. i.e Standard
- ✓ Product identification
- ✓ Contain a declaration statement to be solely responsible on the stated product and compliance to a certain standard
- ✓ Contain name and signatory(s) of the person(s) of declarer on behalf of the organization
- ✓ Manufacturer's name
- ✓ Manufacturer's address
- ✓ Date of declaration





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**The End**