SEMINAR PEMERKASAAN PERUNDANGAN, PELESENAN DAN KESELAMATAN GAS 26 SEPT 2018

"CONDUCT OF REPAIR WORKS, TESTING, COMMISSIONING, DECOMMISSIONING AND RECOMMISSIONING OF GAS PIPE INSTALLATIONS"

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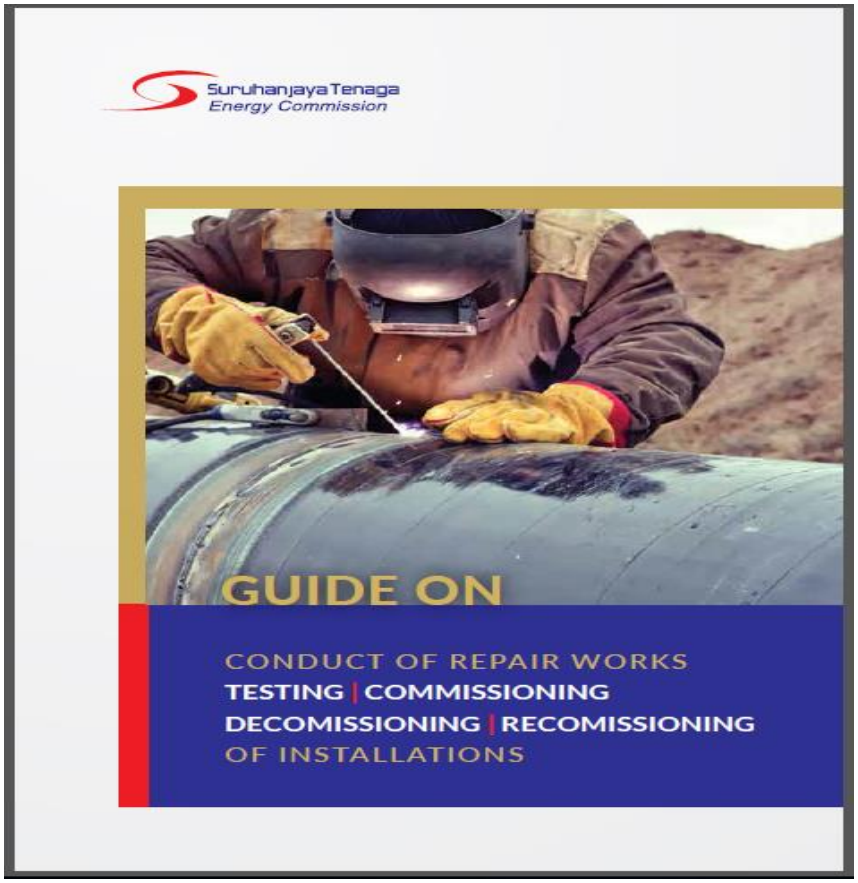


Our Target / Objective

This guide was developed by ST for the following purposes:

- 1 To protect distribution pipelines, piping systems, properties in the vicinity of the said pipelines and piping systems, workers and most importantly the public from dangers arising during the carrying out of works on new and existing installations, or in the vicinity of live distribution pipelines or piping systems.

- 2 To guide Gas Contractors and competent persons, building owners, operators of installations, licensees and third party contractors in matters covered under these guide.

Objektif

Untuk mengurangkan risiko atau mengelak dari berlakunya kemalangan semasa aktiviti tersebut dijalankan.

Kenapa ianya penting ?

Hasil dari siasatan yang dijalankan oleh ST, kebanyakan kemalangan berlaku ketika kerja-kerja pembaikan, ujian dan penjalanan (commissioning) dijalankan. Ini adalah disebabkan oleh tiadanya prosedur yang lengkap, tidak mengunakan peralatan yang sesuai dan tiada pengawasan oleh orang kompetan.

DEFINITION

Pipeline Cleaning

- “pipeline cleaning” is a process or act of removing of dirt and construction debris from the pipeline system.

Pressure Test

-“pressure test” refers to the way of testing performance where the medium to be used is nitrogen, water or air, with the purpose of proving the strength and leaks of a piping system at a specified test pressure, an operation performed to verify the integrity of piping system following its installation or modification

Purging

- “purging” refers to the process of completely removing the contents of a piping system or installation.

Flaring

- “flaring” is a part of the commissioning or decommissioning process where unused mixture of combustible gas and nitrogen is burnt.

SAT

- “SAT” means site acceptance test and refers to the setting up of a relevant equipment or system to be ready for operation and the carrying out of a performance test or simulation test to prove that the said equipment or system was installed at site in accordance with specifications set by the ultimate owner of the equipment or system.

Repair work

- “repair work” means an activity involving physical effort of fixing or mending something to achieve a purpose on an existing gas installation.

Cold work

- “cold work” means repair work which is carried out on an existing installation which does not contain any gas.

Hot work

-“hot work” means repair work which is carried out on an existing installation which contains gas.

AHJ

- “AHJ” means authority having jurisdiction and refers to an organisation, office, or individual responsible for enforcing the requirements of a code or standard, or for approving building, equipment, materials, an installation, or a procedure.

Commissioning

- “commissioning” refers to the process where combustible gas is gradually injected into a piping system to replace the nitrogen therein until the relevant gas detector equipment shows a content reading of 100% combustible gas in the said piping system.

Decommissioning

- “decommissioning” refers to the process where combustible gas is purged from a piping system by flaring and injection of nitrogen until the relevant gas detector equipment shows an LEL reading of 0% combustible gas in the said piping system.

COMPLIANCE TO AUTHORITY REQUIREMENT

. Gas Supply Regulation 1997

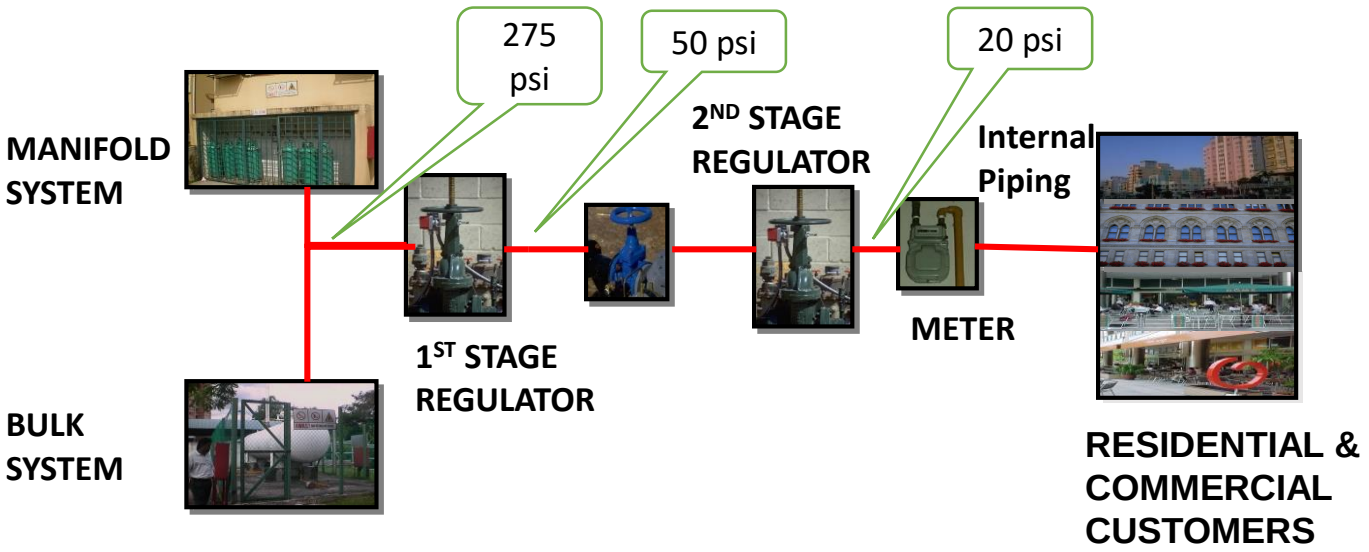
- 18.(1) Before gas is supplied to a new gas installation or an additional gas installation, the gas new installation or the additional gas installation shall be tested and certified to be safe from leakage by the appropriate competent person as specified in Table 2 of the Second Schedule .

- 18.(2) Upon carrying out the test under sub regulation (1), the competent person shall issue a Test Certificate which shall be in Form C as prescribed in the First Schedule.

GAS SUPPLY CONCEPT

LPG SUPPLY CONCEPT

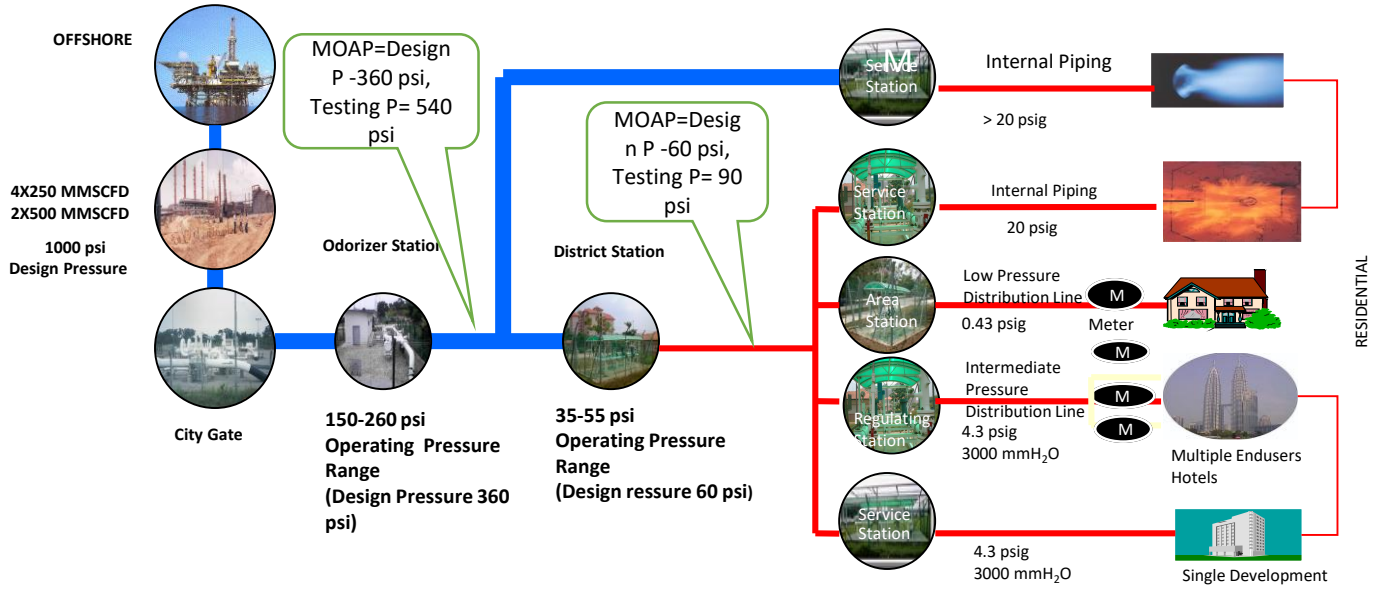
Specifications/ Approving Authorities (Test Pressure)



1. Constructed By	GMSB/Customer	Customer (Except Meter)
2. Design Code	MS 830	MS 930
3. Approving Authority	EC	EC
4. Materials and construction specification	Bulk Tank : BS 5500, ASME Sec IX Cylinder: MS 641, MS 642	Steel : API 5L, ANSI A106, ANSI A120, API 6D, ANSI B16.34, ANSI B16.9, ANSI B16.5, API 1104 PE : MS 1086, ANSI B16.40, BS 7336

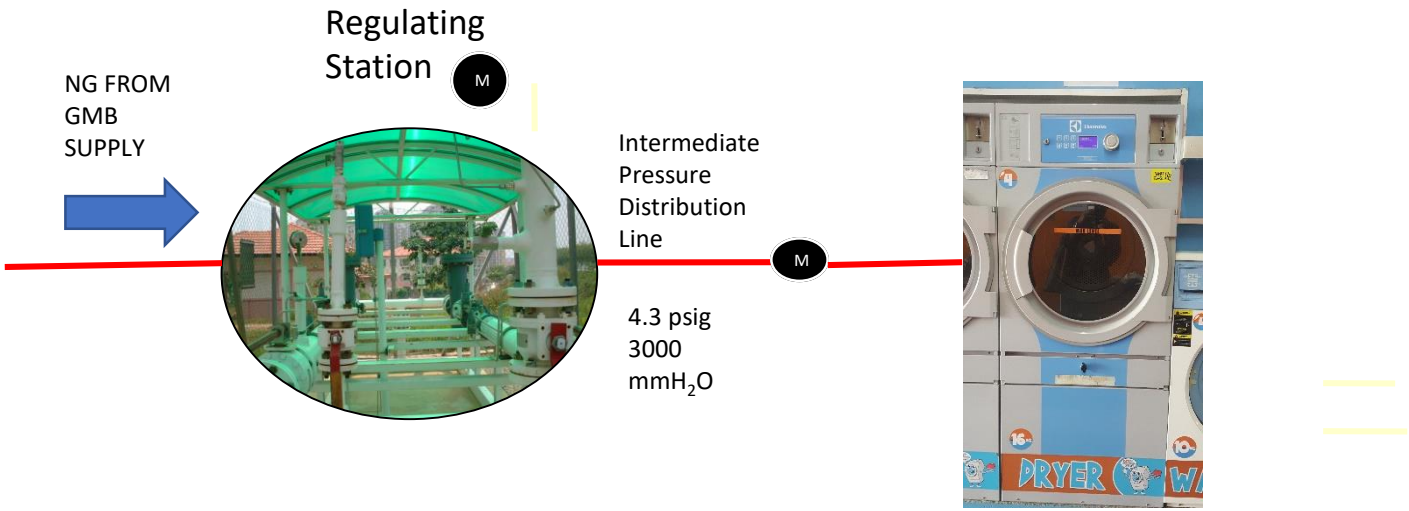
NG SUPPLY CONCEPT

. Specifications/ Approving Authorities



1.Constructed	Petronas	GMSB	GMSB or Customer (Except Meter) Customer
2. Design Code	ASME B31.8	ASME B31.8	ASME B31.8 MS 930
3. Approving Authority	JKKP	EC	Within Factory : JKKP Others :EC
4. Material & Construction		Steel : API 5L, API 6D, ANSI B16.9, ANSI B16.5, API 1102,API 1104	Steel : API 5L, ANSI A106, ANSI A120, API 6D, ANSI B16.34,ANSIB16.9, ANSI B16.5, API 1104
		PE : MS 1086, ANSI B16.40, BS 7336	PE : MS 1086, ANSI B16.40, BS 7336

NG SUPPLY CONCEPT



CODE AND STANDARD INSTALLATION OF THE PIPING SYSTEM

. Compliance to Code and Standard :

i. MS 830 - *Code of Practice for storage, handling and transportation of liquefied petroleum gases.*

ii. MS 930 - *Code of practice for the installation of fuel gas piping systems and appliances.*

iii. ASME B 31.8 - *Code for transmission and distribution piping system*

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TESTING OF THE INSTALLATION

General requirement for Testing

1. Prior to the commencement of testing a completed installation shall comply with the specifications set by the ultimate owner of the equipment or system, applicable code and standards, and requirements of the relevant authority.

2. All test procedures must be reviewed and approved by a competent person.

3. Pipe cleaning was done successfully .

4. In order to ensure that the pressure test operates within the acceptable limits, the pressure applied during a pressure test must take into consideration the effect of a temperature drop on the pressure.

5. The piping system shall be visually inspected by a competent person to ensure that the installation is intact and, installed correctly

6. Test headers and pipe fittings used for testing should have pressure rating greater than test pressure.

7. The test pressure shall be measured and recorded with a calibrated pressure and recorder measuring device with suitable pressure range.

COMMISSIONING OF INSTALLATION

Commissioning

1. Before any commissioning work is commenced, the competent person shall ensure that all pre-commissioning process have been carried out.

2. To start commissioning, the mixed gas in the piping system must be purged and flared, an according with safe practice purging and flaring process.

3. During the displacement of nitrogen with combustible gas, all outlet valves must be shut off, tagged to indicate commissioning in -progress and/or plugged, as appropriate.

4. A final check must be carried out by the competent person to confirm that all valves are positioned in accordance with the commissioning procedure.

5. The competent person must ensure all commissioning personnel are ready. The supply valve must be slowly opened and venting must start at the outlet of flaring torch / burner.

6. At the outlet of the flaring torch/burner, using a gas detector, check the percentage mix of combustible gas and nitrogen.

7. When the gas detector shows a minimum content of 300ppm (0.4% LEL), combustible gas that means nitrogen has been purged and the combustible gas has reached the outlet point.

8. To start the flaring, ignite the flaring torch using a gun lighter, and continuously flare until the colour of the flame changes from yellow to blue.

9. Stop flaring and check contents of combustible.

10 During flaring, cordon off the flaring area. Only the competent person and relevant commissioning personnel are allowed within such area.

PURGING AND FLARING

Site Preparation : Purging and Flaring

1. Main line piping or tubing systems shall be purged outdoors. However, piping after gas meters can be purged in doors.

2. The purging point shall not be less than 3 meters from a building or air intake or any opening of a building, The surrounding designated area for purging must have adequate ventilation.

3 The purging process shall be under the constant supervision of a competent person.

Commissioning of piping system – Purging and Flaring

4. Wind flow direction must be considered especially during flaring.

5. The valve used to release the gas during purging shall not be less than 1.5 meters from the purging point.

6. During the purging, smoking on strictly prohibited.

7. The competent person must ensure that adequate precaution is taken to either remove or shut off any source or potential source of ignition prior to commencing the purge.

Commissioning – Flaring at Burner

8. Outdoor flaring, mainly used for main piping system, must be conducted by using an appropriate burner or flaring stack.

9. Indoor flaring, commonly used after tenant's gas meter, is conducted by using portable burners or appliances.

10. Gun lighters shall be used as ignition source.

REPAIR WORKS

General Requirements Repair Works

- 1 No person shall commence any work on an existing installation without first notifying ST and all the relevant licensees.

- 2 Such work shall be fully supervised in accordance with Regulation 21 of the Gas Supply Regulations 1997.

- 3 Contractors who intend to carry out any repair work shall comply with Regulation 103 and Regulation 104 of the Gas Supply Regulations 1997, and workers shall comply with Regulation 81 of the Gas Supply Regulations 1997.

OTHER SAFETY REQUIREMENT

Safety Requirements

It is the responsibility of a competent person to ensure general safety requirements are complied with, including but not limited to the following:

- The relevant Permit to Work is secured.
- The procedures and JSA for said repair work are approved and endorsed.
- All equipment is in good condition and safe to be used.
- All personnel are thoroughly briefed on safety matters, their duties and their responsibilities.

PERMIT TO WORK

Ref No:						
HOT WORK		COLD WORK		Date of Issue	Validity From	To date
				Time of issue		
				Owner Emergency contact no: Gas Contractor Emergency contact no:		
Location of work and Limitations				Name of Competent Person and Competency Registration No.:		
Work Description						
Date and Time Required	Date:		Work Start:		Time Completion:	Hours
Gas Contractor	Name: Address: Telephone number:					
Tools, Equipment, and Machinery used	☐ Excavator ☐ Crane ☐ Welding Set ☐ HDD Machine		☐ Fire Extinguisher ☐ Oxy-acetylene Cutter ☐ Nitrogen gas ☐ Piling Machine		☐ _____ ☐ _____ ☐ _____ ☐ _____	
Facility Involved	☐ LPG Bulk Tank/Cylinder ☐ NG Piping System ☐ LPG Piping System ☐ NG Steel Pipeline		☐ NG PE Pipeline ☐ Riser ☐ ☐		☐ _____ ☐ _____ ☐ _____ ☐ _____	
PPE	☐ Safety Helmet ☐ Dust mask ☐ Ears plug ☐ Face Shields		☐ Safety Boots ☐ Safety Vest ☐ Breathing apparatus ☐ ----------		☐ ---------- ☐ ---------- ☐ ---------- ☐ ----------	
Identification of Hazards						

SAMPLE

Precautions to be Taken				
Supporting Documents	**Description**	**YES**	**NO**	**Remarks**
	Approved Working Procedure			
	Approved JSA			
	Mitigation of risk			
	Others			
AUTHORISATION AND ACCEPTANCE OF PTW				
Owner Authorisation	I confirm that the information in this PTW is correct insofar as those matters which are within my direct knowledge or control, and hereby authorise the Gas Contractor to carry out the work as specified in this PTW in accordance with its term and conditions. Signed : Date: Time:			
Contractor Acceptance of PTW	I confirm that the information in this PTW is correct insofar as those matters which are within my direct knowledge or control, and will undertake work in accordance with its term and conditions. Signed : Date: Time:			
Competent Person Acceptance of PTW	I confirm that the information in this PTW is correct insofar as those matters which are within my direct knowledge or control, and will undertake work in accordance with its term and conditions. Signed : Date: Time:			
CANCELLATION OR EXTENSION OF PTW				
Gas Contractor	I confirm that: *** ☐ 1. The work has been completed 2. All persons under my supervision, materials and equipment have been withdrawn from the site; and 3. The site is now safe. *** ☐ I confirm that the work has not been completed and permission to continue is requested Signed by Gas Contractor : Date: Time: *** Choose one			
Owner	*** ☐ I hereby cancel this PTW with effect from the date and time the Gas Contractor has signed the above confirmation. *** ☐ I hereby authorise the Gas Contractor to continue work in accordance with the terms of this PTW save and except for the time which shall be extended to ___/_____/20___ at _____ am/pm, upon which the PTW is automatically cancelled. Signed by Owner or Representative : Date: Time: *** Choose one			

Suruhanjaya Tenaga
Energy Commission

INSTALLATION COMPLIANC TO CODE AND STANDARD

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Energy Commission

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Suruhanjaya Tenaga
Energy Commission

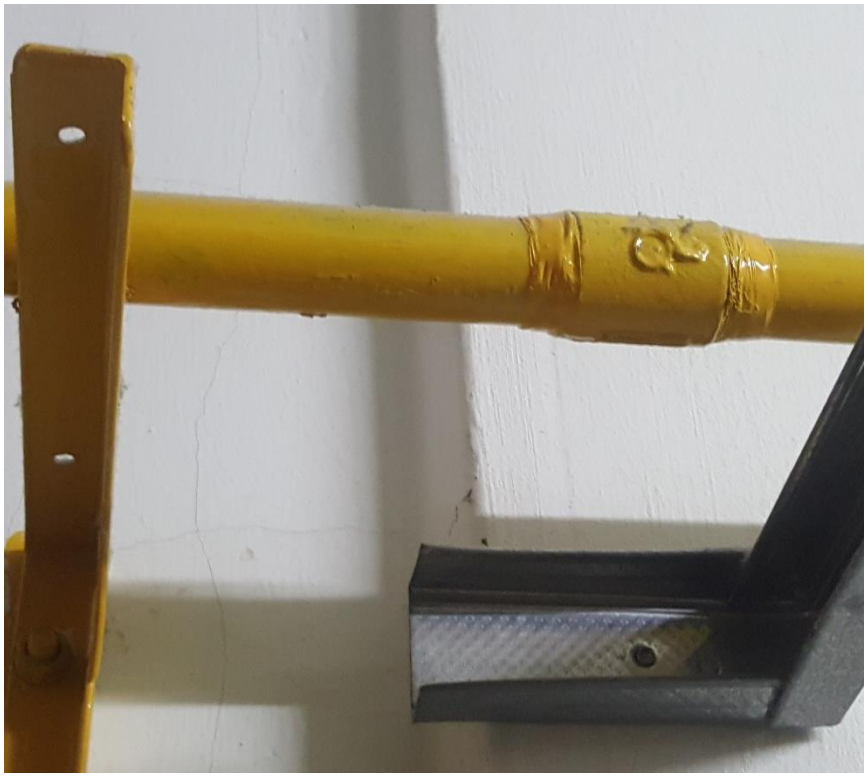
UNSAFE PRACTICE

UNSAFE INSTALLATION

UNSAFE INSTALLATION

UNSAFE INSTALLATION

UNSAFE INSTALLATION



UNSAFE INSTALLATION

UNSAFE INSTALLATION

Berikut adalah diantara kemalangan- kemalangan yang telah terjadi semasa aktiviti tersebut dijalankan :

KEMALANGAN

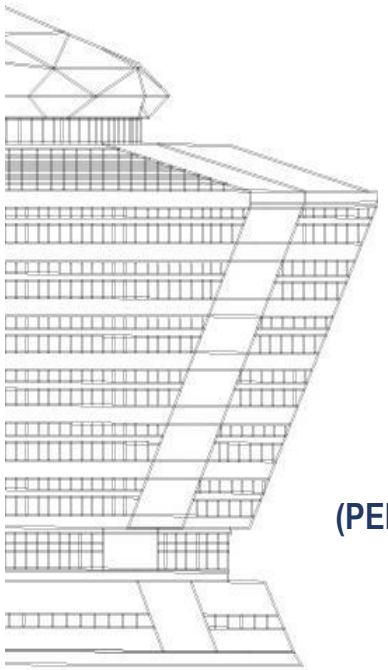
Keratan Akhbar (15 Disember 2009) – AEON, Melaka

Lelaki maut pasar raya meletup

20 turut cedera termasuk enam panah dipercayai sistem paip gas bocor

Keratan Akhbar (28 September 2011) – Empire Mall

Kemalangan (8 December 2016) - Seringin Residences



TERIMA KASIH

MOKHTAR BIN MOHD NOR

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(PEMBANGUNAN KESELAMATAN ELEKTRIK / GAS)
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