

Short Course on Flood Emergency Response Planning

MECHANICAL ENGINEERING TECHNICAL DIVISION



reported by
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The recent 2014/2015 floods will, without doubt, be remembered as one of the most devastating calamities in local history. More than 250,000 people were displaced by the floods which resulted in thousands of homes being cut off from outside assistance. The flood waters stayed for days in many areas. Kelantan, Terengganu and Pahang were the hardest hit while Perlis, Perak, Johor, Sarawak and Sabah were not spared either.

To show our concern, the IEM Mechanical Engineering Technical Division (METD) organised a half-day short course on flood emergency response planning on 26 January 2015. All proceeds from the course were channelled to the IEM flood charity relief fund. The fund enabled the IEM Young Engineers Section to help flood victims rebuild their lives in a small way.

Ir. Loo Chee Kin, a senior consultant with Global Risk Consultants (GRC), conducted the half-day course.

What is a flood? "Plainly, flood is a rising and overflowing body of water making its way onto a normally dry piece of land. In a layman's term, it is water where it is not supposed to be," said Ir. Loo.

He started with the fundamentals. Water flows downhill due to gravity. Water flows in

the path of least resistance and, according to fluid mechanics, water moves in relation to each other. But the volume remains relatively constant because of the strong cohesive forces between the molecules. As a result, liquid can take the shape of the container it is in, and it forms a free surface in a larger container in a gravitational field.

What causes flooding? Many cities and towns in Malaysia are located on river banks due to historical development as rivers offer easy availability of drinking water, the presence of flat and fertile agriculture land, transportation and development of trading ports.

Floods can occur due to:

- Heavy rain (as witnessed in the recent flood)
- Failed protective devices such as dams, disused mines or aquaculture ponds
- Inadequate drainage systems, flash flood
- Tropical storms (worst in typhoon)
- High tide
- Melting snow (though not in Malaysia)

In hydrology, flood mitigation measure is designated by recognition of the likely

Flood recurrence interval	Time period being considered				
	1	2	5	10	50
10	9.52%	18.13%	39.35%	63.21%	99.33%
25	3.92%	7.69%	18.13%	32.97%	86.47%
50	1.98%	3.92%	9.52%	18.13%	63.21%
100	1.00%	1.98%	4.88%	9.52%	39.35%
250	0.40%	0.80%	1.98%	3.92%	18.13%
500	0.20%	0.40%	1.00%	1.98%	9.52%

Table 1

recurrence interval of a flood (i.e. 25 years, 100 years, 500 years). The likely recurrence interval of an event gives the average length of time between occurrences. If a structure is built on a 25-year recurrence interval flood level, the chances of flooding in 5 years are 18.13%. And if it is built on a 50-year recurrence interval flood level, the chances of flooding in 5 years are 9.52%. So, by building a structure on a 500-year recurrence interval flood level, the probability of flooding in a given locality is reduced drastically (refer to Table 1).

How does one respond to impending flood? Ir. Loo said we need to know the likely exposure, available warning system and possible actions before, during and after the flood. He shared some useful river data and flood warning data with the participants. The key government website is <http://infobanjir.water.gov.my/>. Participants had a chance to practise writing a flood emergency response plan in class.

What can you expect when you are driving in a flood? Here are three situations:

- In 150 mm of water, the flood reaches the bottom of most passenger cars and it can cause loss of control and possible engine stalling.
- In 300 mm of water, many vehicles will float or drift away.
- In 600 mm of rushing water, the flood can carry away most vehicles.

In the post-flooding period, damage assessment and task prioritisation checks should be carried out first. Most electrical and mechanical equipment can be salvaged if properly dewatered, dried, corrosion stopped and serviced before powering or attempting to operate them.

In summary, flood can often be predicted and mitigated. Proper flood response planning will limit damage and aid speedy recovery. Knowing what to salvage and recover will help humans and business return faster to normal routine. ■

IEM DIARY OF EVENTS

Title: 11th Annual General Meeting of the Project Management Technical Division, IEM

22 August 2015

Organised by : Project Management Technical Division
 Time : 11.00 a.m. – 1.00 p.m.
 CPD/PDP : 2

Title: Two Day Course on Basic Project Management for Engineers

25 - 26 August 2015

Organised by : Graduates & Student - The Young Engineers Section
 Time : 9.00 a.m. – 5.30 p.m.
 CPD/PDP : 14

Kindly note that the scheduled events below are subject to change. Please visit the IEM website at www.myiem.org.my for more information on the upcoming events.