

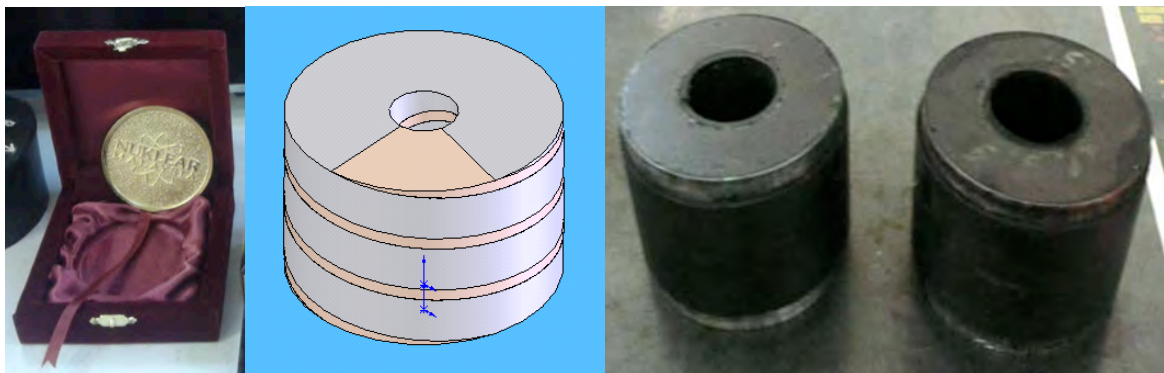
E-SEER UTM WON GOLD AND SILVER MEDALS AT HARI INOVASI NUKLEAR MALAYSIA 2012

Features ground breaking inventions, SEER-iPLAT and SEER-mSAG



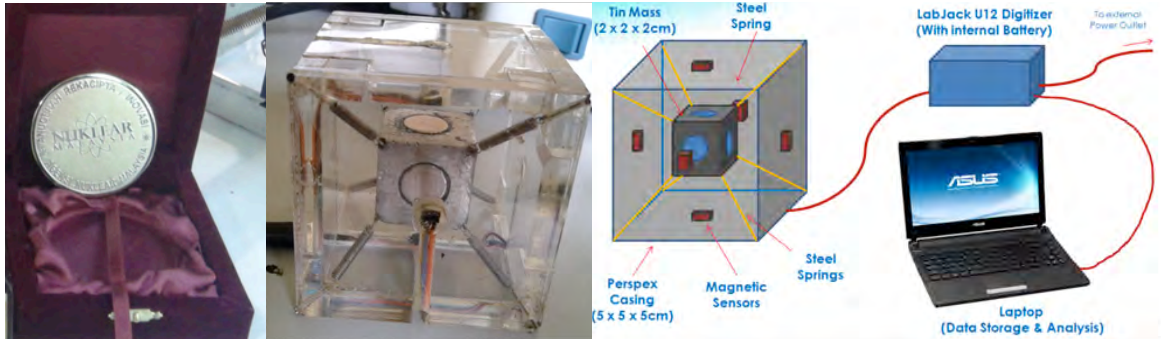
'Piala Pusingan Inovasi Jemputan', Gold and Silver medals won by e-SEER UTM at Hari Inovasi Nuklear 2012, Prof. Dr. Azlan Adnan engrossed in discussion with visitors.

Bangi, July 4: The e-SEER (Engineering Seismology and Earthquake Engineering Research) team from Department of Structural Engineering, Faculty of Civil Engineering, Universiti Teknologi Malaysia lead by Prof. Dr. Azlan Adnan, has won two medals at Hari Inovasi Nuklear Malaysia 2012 held at Agensi Nuklear Malaysia (Nuclear Malaysia) in Bangi recently, from 2 to 4 July in conjunction with its 40th anniversary. The e-SEER team also bags home 'Piala Pusingan Inovasi Jemputan', and RM800 cash as the overall winner for the Invitational Invention Category. A total of 29 products from institutions inside and outside Nuclear Malaysia, were exhibited in the event.



SEER-iPLAT invention which won the gold medal and first place in Invitational Invention Category at Hari Inovasi Nuklear Malaysia 2012.

Two inventions from e-SEER, SEER-iPLAT (a seismic isolation platform) and SEER-mSAG (seismo-accelerograph and crack detector for shell structures), won the gold and silver medals respectively, handed out by the Director-General of Agensi Nuklear Malaysia, Dr Muhamad bin Lebai Juri.



SEER-mSAG invention which won the silver medal and second place in Invitational Invention Category at Hari Inovasi Nuklear Malaysia 2012.

The team comprised of Prof. Dr. Azlan Adnan, Mohd Nur Asmawisham bin Alel, Mohd Zamri bin Ramli, Reza Vafaei, Patrick Tiong Liq Yee and Sk Muiz Sk Abd Razak.



l-r: e-SEER team; Prof. Dr. Azlan Adnan, Mohd Nur Asmawisham bin Alel, Mohd Zamri bin Ramli, Reza Vafaei, Patrick Tiong Liq Yee and Sk Muiz Sk Abd Razak.

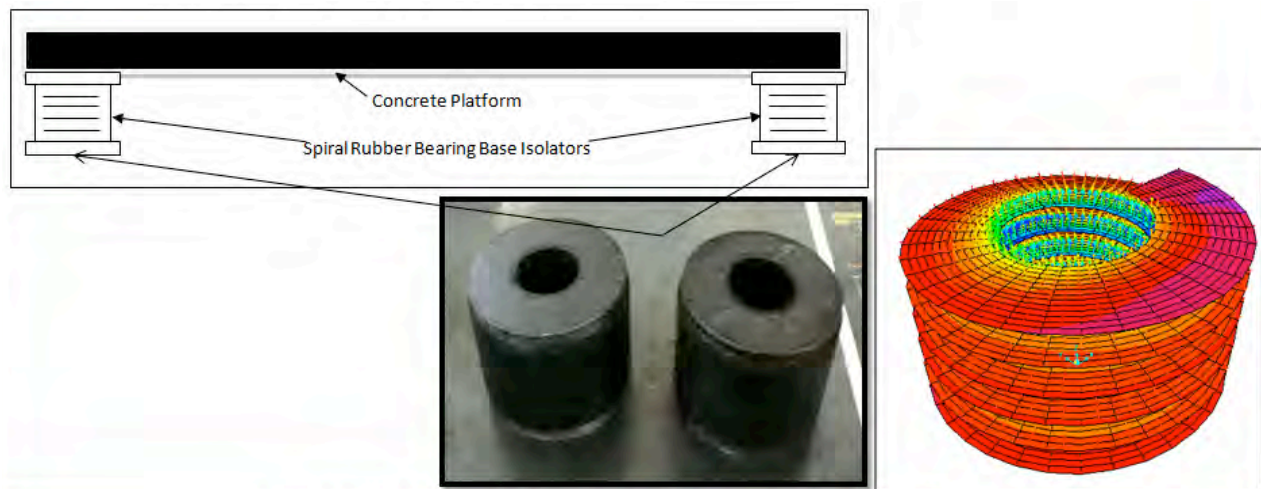
The event was officially graced on July 2 by the Deputy Chief Secretary (Science) of MOSTI (Ministry of Science and Technology Malaysia), Yang Berbahagia Professor Datin Paduka Dr. Khatijah bt Mohd Yusoff.



Yang Berbahagia Professor Datin Paduka Dr. Khatijah bt Mohd Yusoff, Deputy Chief Secretary (Science) of MOSTI given a tour around the booths at Hari Inovasi Nuklear Malaysia 2012 by Dr Muhamad bin Lebai Juri, Director-General of Agensi Nuklear Malaysia after officiating the event earlier.

According to team leader, Prof. Dr. Azlan Adnan, SEER-iPLAT, a seismic isolation platform, which consists of two main components, namely the spiral rubber bearing base isolators and concrete platform, reduces the effect of the horizontal components of the ground acceleration by interposing structural elements with low horizontal stiffness between the structure and the foundation, subsequently giving the structure a fundamental frequency that is much lower than both its fixed-base frequency and the predominant frequencies of the ground motion. In essence, the isolation system not only absorbs the earthquake energy but also deflects it through the dynamics of the system.

Due to its unique circular hollow in shape, the product produces a very high vertical stiffness but still flexible in horizontal translational direction. Therefore, the base isolator is able to carry very large loads as well as very small loads, compared to commercially available product which only suitable for buildings or structures with weights of a 3 to 10 storey building. The isolator maintains its required horizontal stiffness, flexibility and stability to act as an isolator to the structure from ground movement due to earthquakes; and at the same time, the amount of rubber and steel materials used has been reduced significantly, thereby reducing the cost of production. The advantages of using SEER-iPLAT includes its simple design, inexpensive manufacturing cost, easy installation procedure as well as its effectiveness in isolating structures from earthquake ground motions compared with the other types of isolators, rendering it particularly helpful for potentially sensitive structure such as the nuclear power plant, which will indirectly protect the surrounding areas and inhabitants.




SEER-iPLAT consists of a customizable (concrete or steel) platform supported by spiral rubber bearing base isolators.


SEER-mSAG, on the other hand is a seismo-accelerograph and crack detector for shell structures. The invention utilizes a mass element spatially suspended and moves freely within a framework when the ground moves. Its novelty lies in its ground breaking concept of applying the concept of ground motion detection to detect crack in the structure. The fundamental concept is that as with the formation of faultline on earth's surface after an earthquake, a certain amount of energy is also released during the formation of crack on a structure surface. SEER-mSAG utilizes magnetometer technology to detect magnetic variations that are generated by permanent magnets attached to the mass element. These magnetic variations are later converted into digital signals and into computer readable seismograms and accelerograms in real-time.

Product Features

SEER-mSAG, the ultra-portable Seismo-Accelerograph, works through a new concept of tri-axial movement of a single inertial mass that captures the vibration wave due to energy released by earthquake ground motion and crack propagation.



Crack in Structures




Earthquake Ground Motion

1 Ground Motion & Crack Detection

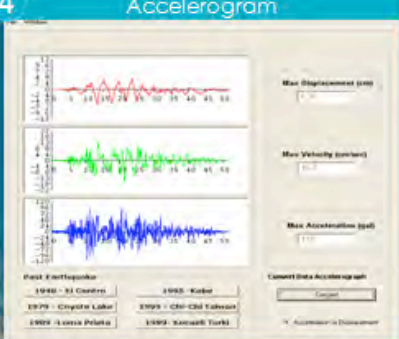
2 SEER-mSAG

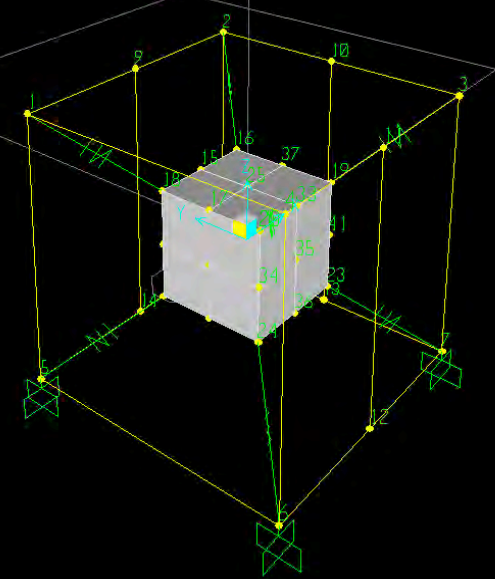
Simultaneous detection of vibration wave in three orthogonal directions: one vertical (z-axis) and two horizontal (x and y-axis).

3 Seismogram

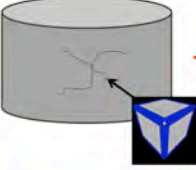


4 Accelerogram

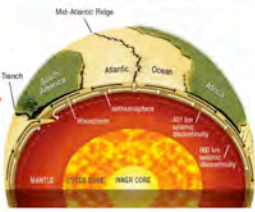




Basic Concept of Crack Detection



Local Concept
Crack on the surface of the shell structures



Global Concept
Faultline as the crack on the earth crust/ surface

SEER-mSAG product features and the concept of crack detection on structure

In practice, SEER-mSAG is designed not only for the purposes of detecting earthquakes and measuring the magnitude, distance and actual ground acceleration due to earthquakes in three dimensional directions, but at the same time is able to use the similar concept to detect and measure the magnitude and distance of cracks, especially and inevitably important in term of seismic risk and hazard monitoring of structures, considered important to national security, such as the Nuclear Power Plant, Oil Storage Tank, Water Tank and many others, where the formation of crack might to widespread damage, and cause major structural catastrophe to the nation.

In brief, both SEER-iPLAT and SEER-mSAG will immensely be indispensable towards better structural monitoring and security in the futures, consequently ensuring increase in investor's belief in the nation's infrastructure and provide more security to the public user, hence tremendously contributing to the nation's economy growth while providing local expertise in safeguarding the structures against seismic risks and structural defects such as cracks.



Certificates for SEER-iPLAT (Gold Medal) and SEER-mSAG (Silver Medal)



Patrick Tiong Liq Yee and Sk Muiz Sk Abd Razak at the booth.