

# DEVELOPMENT OF MOBILE EMERGENCY MONITORING SYSTEM FOR RADIOLOGICAL RAPID ASSESSMENT DURING NUCLEAR AND RADIOLOGICAL ACCIDENTS

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## ABSTRACT

The mobile emergency radiological monitoring system that has developed is basically a transportable shelter based with comprehensive package of instruments designed for precise in-situ rapid measurement and assessment of radiation ambient level, airborne activity reading and local meteorological condition. The system also equipped with GPS device to provide the exact geographical location information during performing the monitoring. The collected monitoring data can be transmitted from the mobile monitoring station to the base station computer located in Nuclear Malaysia's premise thru unique operating system software and cellular GPRS modem for the maximum flexibility. The system takes a year to develop it and instead of performing the measurement and monitoring during the emergency, it also can be used for routine environmental and radiological monitoring around the radiation/nuclear facilities.

## INTRODUCTION

The accident happens at the Fukushima Daiichi nuclear power plant (NPP) in March 2011 was demonstrated that the importance of rapid assessment practice in obtaining the immediate radiological monitoring result during an emergency. Application of the rapid assessment method will expedite the government and decision-makers to make accurate and immediate response action in dealing with nuclear and radiological accident, so that the accident can be under control and will not become worse. Therefore, to enhance the capability of Malaysia in nuclear & radiological emergency preparedness and response, a mobile emergency monitoring system has been developed as moveable radiological and meteorological emergency monitoring/measurement laboratory.

## OBJECTIVE

The objectives for developing the Mobile Emergency Monitoring System are;

- 1) To measure, monitor, analyse and record the radiation ambient level, airborne radioactive contamination activity and local meteorological condition of a particular working area or large district area.
- 2) To acquire details data and information about radiation level, airborne radioactive contamination activity and meteorological conditions for a particular area during a nuclear /radiological emergency incident
- 3) To establish the databases and to develop the rapid assessment methodology for monitoring the radiation level, airborne contamination and meteorological condition during the emergency

## DEVELOPMENT CHALLENGES

Due to the strict government funding scope and conditions, the procurement of a vehicle as a moveable or mobile laboratory is strictly restricted. Therefore, as a solution, a wheeled-base transportable shelter was selected as an alternative to be a mobile boratory system. In addition, the instruction by the management have been clearly made that the mobile laboratory must be internally developed homegrown by Nuclear Malaysia and the whole project should be completely accomplished in a year.

## RESULT

In order to achieve the objectives, several scientific instruments have been mutually installed in the transportable shelter as shown below to provide the radiological, location positional and meteorological data during the monitoring:-

1. Environmental wide area Gamma measurement system device
2. Continuous airborne monitoring system device (Particulate and Iodine)
3. Continuous meteorological monitoring device
4. Radiological and meteorological information display software
5. Global Positioning System Equipment (GPS)
6. Cellular GPRS modem
7. On-board operation interface and data acquisition computer system (Industrial PC)

The monitoring data from instruments will be prudently collected by on-board computer system (thru unique radiological information display software) and then can be firmly transmitted to the base station computer located in Nuclear Malaysia's premise thru internet access. located in Nuclear Malaysia's premise thru internet access.

## CONCLUSION

After an intensive year of development, in house made of the mobile emergency monitoring system has been successfully developed by Nuclear Malaysia and named as Mobile Radiological Laboratory (MRL). The state of art of MRL with in-situ radiological rapid assessment capability is being readily served to be functional as a portable emergency radiation monitoring.

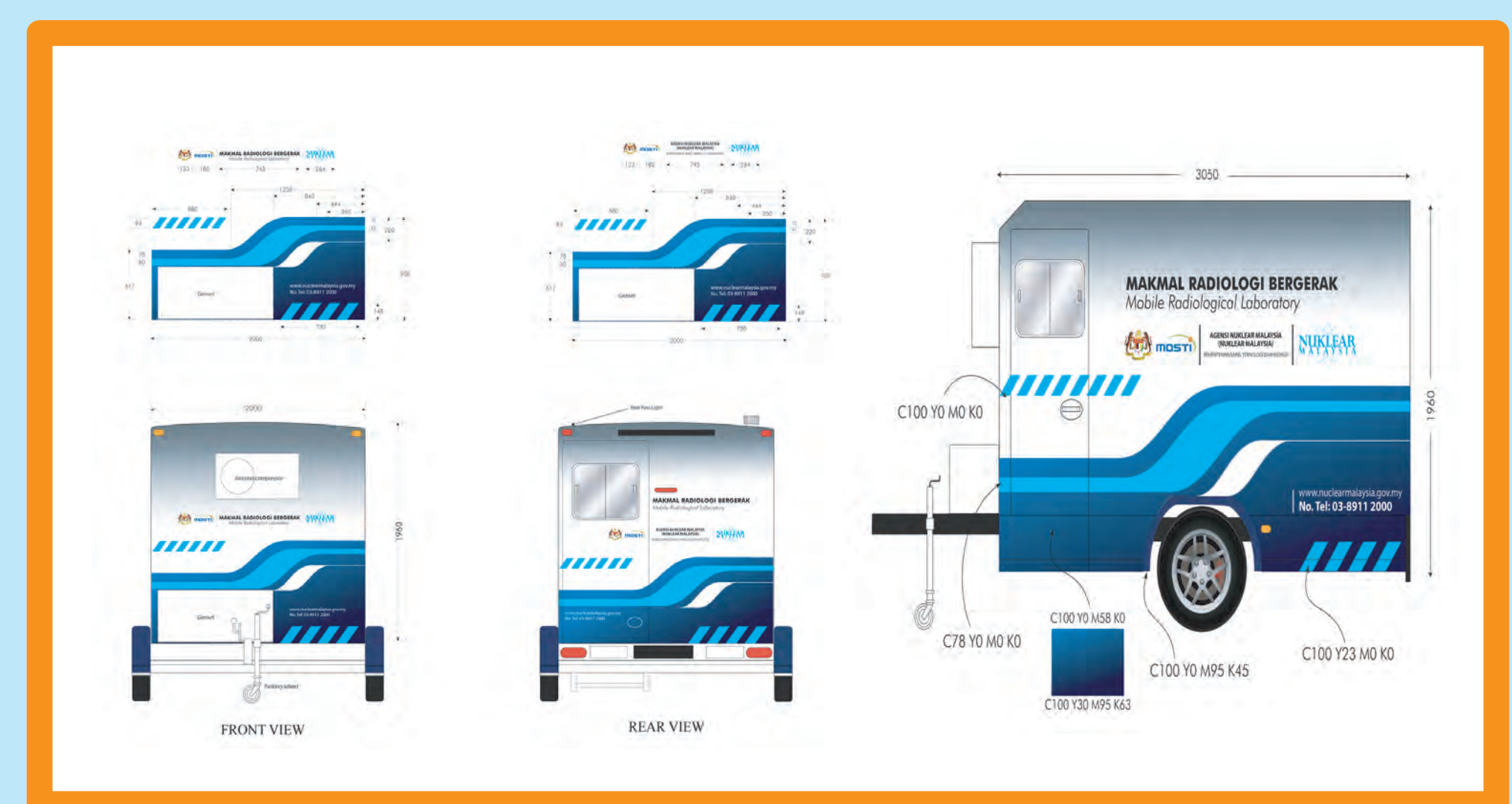
It has been noted that the MRL is the first mobile emergency monitoring system that has been originally developed in the ASEAN region.

## REFERENCES

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## DEVELOPMENT FLOW

Designing



Fabrication



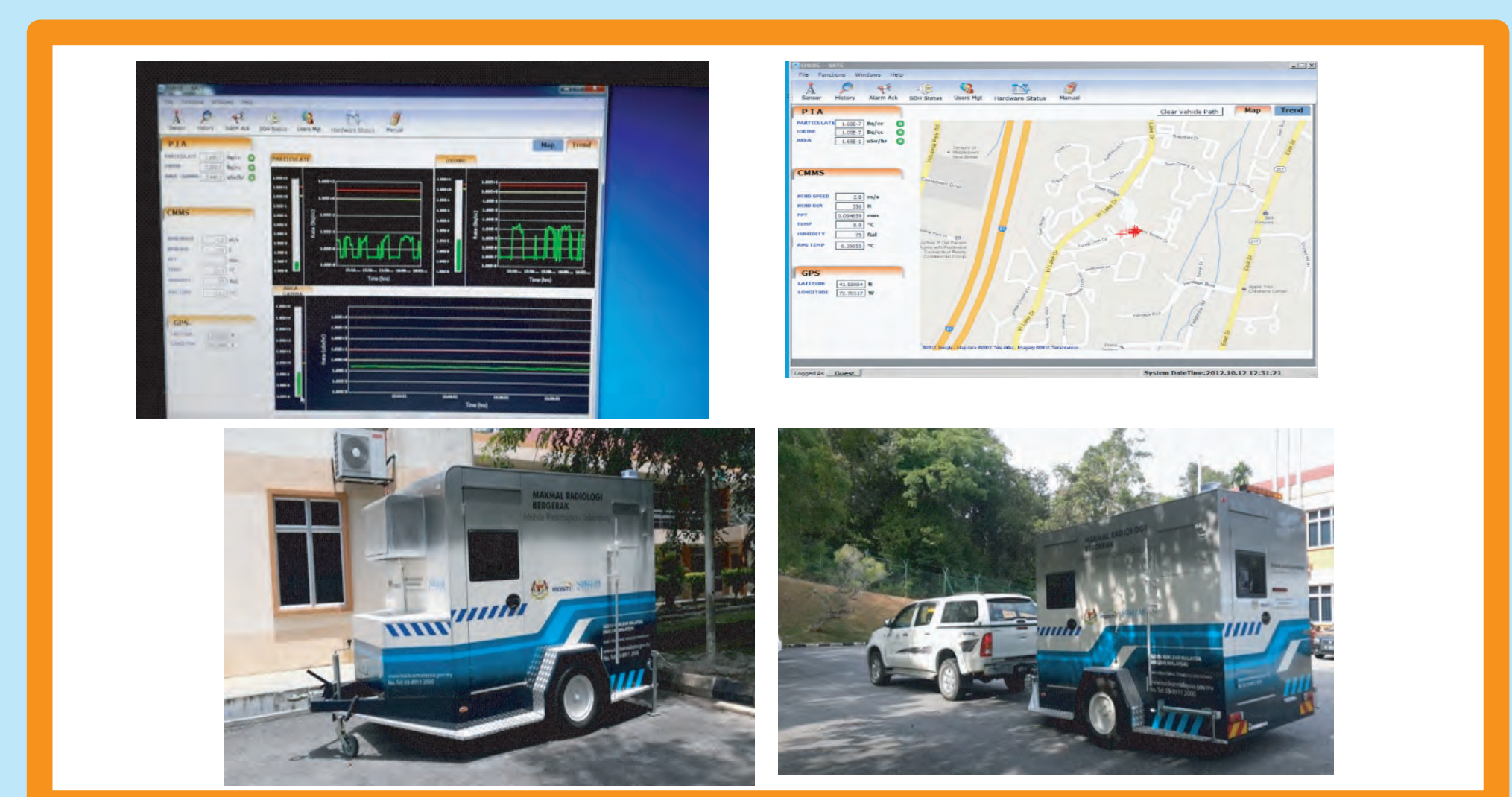
Instrumentation



Installation



Commisioning



## ACKNOWLEDGEMENT

The authors wish to thanks Government of Malaysia through the Ministry of science, Technology and Innovation for funding this project