



Experience on the Assessment of Exercises for Emergency Preparedness & Response at the Centre for Accelerator Science and Technology

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1. Introduction

The Centre for Accelerator Science and Technology (CAST) is currently operating nuclear facilities such as accelerator neutron generator, electron beam machine, uranium purification laboratory, and *Kartini* research reactor. Therefore, CAST must have a program and plan for radiological emergency preparedness and response (EPR) with at least practically exercised annually. The exercise scenario for year 2013 was a fire occurred in the area of reactor ventilation system, followed by an explosion causing two victims need to be evacuated. Government agencies such: nuclear regulatory body, local police department, hospital, fire brigade, local government, emergency response division, university staff, etc. have been participated. The exercise focused on key emergency responder coordination and critical decision-making processes for integrating local government assets necessary to protect public health following a radiation incident. The whole exercise monitored through video monitoring system from the central alarm station (CAS).

2. Method

The method used is through an observation and overview, evaluation, and assessment on the emergency exercises and even on the real emergency events within the period of 2006 - 2013. As a regulation mandatory, CAST through EPR team has conducted exercises simulating radiological emergencies relating to *Kartini* research reactor operation. CAST hosted an EPR exercises for emergency conditions (on- and off-site) annually, and the assessment on the exercise performed accordingly. The exercise was to evaluate the initial response to the incident and the management of the consequences associated with external events such as earthquakes and volcano eruptions, terrorism, and work incidents.

3. Result and Discussion

Exercise Scenario and Implementation

Monday, December 23, 2013, the EPR team held an integrated exercise with the scenario as follows: when the reactor was operating and there was a visit from students of 15 people, and along with it there is a component repair work (iron door) near the blower room using the welding equipment done by 2 people. Suddenly, there was an explosion in gas tube welding equipment resulting in faulty ventilation systems followed by fire. Two people injured in the blast, while, CAS officers saw this incident and immediately report to Head of Nuclear Security Unit, then forwarded to Head of CAST. In the mean time, the reactor supervisor ordered to shutdown the reactor and report the incident to the Head of Reactor Division.

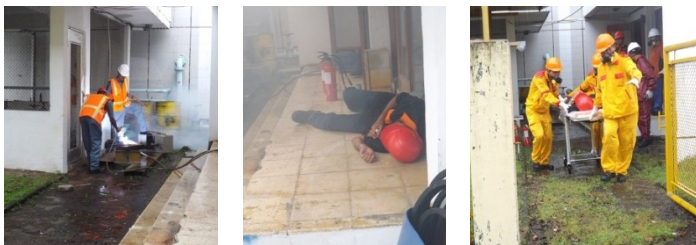


Fig. 1. Worker using welding machine, victim, evacuation of victim.

Figure 1 and Figure 2, shows the situation when worker using welding machine, victim, evacuation of victim, medical assistance team, and fire brigade, as well as an evaluation meeting. The exercise was participated by several government agencies such: nuclear regulatory body (BAPETEN), local police department, hospital, fire brigade, local government, emergency response division, university staffs, etc. The exercise focused on key emergency responder coordination and critical decision-making processes for integrating local government assets necessary to protect public health following a radiation incident.

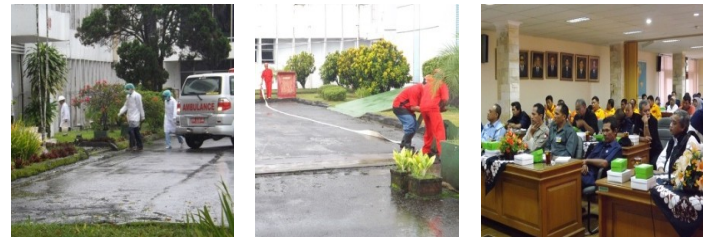


Fig. 2. Early medical assistance team and fire brigade in action, and evaluation meeting.

Discussion

The assessment of EPR exercise showed that within around 9 minutes the victims can be evacuated successfully, and the event can be overcome within 20 minutes. The evaluation team members agreed that all EPR team members participated actively and seriously in the exercise. Some input and suggestions come from evaluating members, the Local Police Department suggest that it needed an additional ambulance, and standard operating procedure (SOP) be improved after evaluation. The Local Disaster Mitigation Agency (LDMA) suggesting that CAST prioritize to make contingency plans together with LDMA. While, the representatives from the university suggest that a copy of the exercise manuscript should be given to evaluating guests in order to know the exercise scenario, and safe limit should be more emphasized. The relevant local organizations agreed to enhance the response arrangements in an emergency as well as in the post emergency phase. The EPR organizational structure consisted of several task forces such as described in Fig. 3.

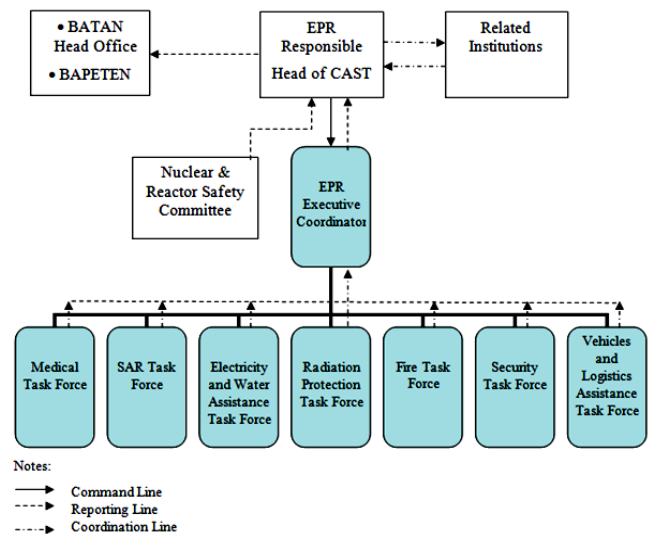


Fig. 3. Organization Structure EPR of CAST

Conclusion

The assessment of the EPR exercise in 2013 showed that the overall emergency event can be overcome within 20 minutes. In general, the objectives of EPR exercises have been fulfilled with several recommendations from participants as feedback. The result in accordance with the general objective of EPR exercises i.e.: test & validate plans and procedures, test the readiness of response capabilities, and increase the confidence and skill of personnel. The exercises allow emergency response staff to identify weaknesses so they can improve performance during an actual response, and those have been proven when big earthquake with acceleration of 0,15g hit the reactor complex on 26 May 2006, and a big eruption of mount *Merapi* in 5 November 2010, as well as eruption of mount *Kelud* in 2014. During those external events, the EPR team members have been working with a good performance.